



Work Instruction Document

Document Title	HECO Compliance Verification for Sol-Ark 60K-3P
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Document Revision History

Rev.	Date	Author	Description of Changes
001	03/06/2024	Alessandra B.	Document Created
002	10/01/2024	Michael I.	Reformat and Changed Parameters To L-N


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Purpose:

In addition to normal Sol-Ark setup requirements (day/time, battery size, battery voltages, Grid mode: Sell or limited load, TOU, and others), this document shows the HECO grid parameters that need to be changed during the inverter commissioning phase to be compliant with HECO regulations.

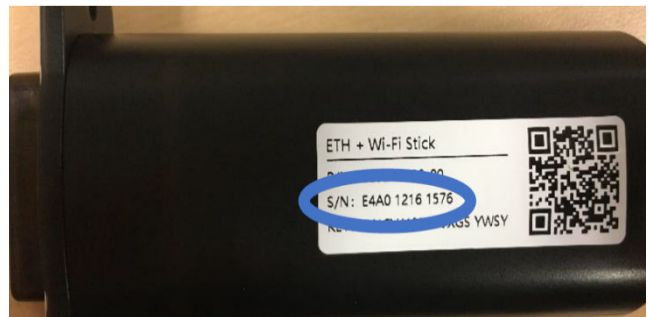
Scope:

The following work instructions for the HECO grid parameters that apply to the following inverter model numbers: Sol-Ark 60K-3P-480V. These steps must be completed before HECO submission.

 **CAUTION:** Consult with HECO to verify any settings before changing the interconnection parameters shown.

Instructions:

1. Take a photo of the serial numbers on the side of the system. The top ID is for the unique Sol-Ark computer. The pictures below show the inverter serial number (on the left) and the WIFI serial number (on the right). These numbers are used for monitoring registration. They are both unique to your system. Example below:



2. Take a photo of the settings screen to verify the date/time, Communication (Comm), and MCU versions. Example below. Software versions of this version or later.

System Setup  1/25/2021 03:05:27 PM Mon.

Basic Setup

System Alarms

Battery Setup

Li-Batt Info

Grid Setup

Sol-Ark 5k/8k/12k/15k-P
 - ID: ##### SD
 - COMM: ###
 - MCU: Ver####

Firmware Versions
60K – MCU: v1057 or later
60K – COMM: 101F or later

3. Take a photo of the **Grid selection** (found under Grid Setup) where you must select the proper Grid Mode and set the Constant Power Factor [Power Factor in our GUI].
 - a. Set Grid Mode to **SRD-UL-1741**.
 - b. Power Factor = **-0.900**.
 - c. Grid reconnection time = **300s (default)**.
 - d. Select LN: **277V/LL:480V(AC)**.

The screenshot shows the 'Grid Param' dialog box with the 'Grid Selection' tab selected. The 'Grid Mode' is set to 'SRD-UL-1741'. The 'Grid Reconnect Time' is set to '300s'. The 'Power Factor' is set to '-0.900'. The 'Grid Frequency' is set to '50Hz'. The 'Grid Level' is set to 'LN:277V/LL:480V(AC)'. The 'Phase Type' is set to '0/240/120'. There is an unchecked checkbox for 'IT system-neutral is not GND'. The 'CANCEL' and 'OK' buttons are visible at the bottom.

4. Under the **Connect** tab adjust the “Reconnect” and “Normal Connect” settings according to the grid type (277/480V). Take a photo.

The screenshot shows the 'Grid Param' dialog box with the 'Connect' tab selected. The 'Reconnect' settings are: Grid Vol High (290.9V), Grid Vol Low (243.8V), Grid Hz High (60.1Hz), Grid Hz Low (59.5Hz), and Reconnect Ramp rate (300s). The 'Normal connect' settings are: Grid Vol High (332.4V), Grid Vol Low (138.5V), Grid Hz High (65.0Hz), Grid Hz Low (50.0Hz), and Normal Ramp rate (300s). The 'CANCEL' and 'OK' buttons are visible at the bottom.

5. Program the proper Low/High Voltage Ride Through & Low/High Frequency Ride Through in the **IP** screen. Make your settings match the picture below corresponding to the appropriate grid type (277/480V). Take a photo.

Grid Param			
Grid selection	Connect	IP	F(W) V(W)/V(Q) P(Q)/P(F)
Over Voltage U>(10 min. running mean)			239.2V
HV3	332.4V		
HV2	332.4V	-- 0.16s	
HV1	304.7V	-- 13.00s	
LV1	243.76V	-- 21.00s	
LV2	138.5V	-- 2.00s	
LV3	138.5V		
HF3	65.00Hz		
HF2	65.00Hz	-- 0.16s	
HF1	63.00Hz	-- 180.00s	
LF1	57.00Hz	-- 180.00s	
LF2	50.00Hz	-- 0.16s	
LF3	50.00Hz		
CANCEL		OK	

6. Program **F(W)** - Frequency-Watt to match the picture below. Take a photo.

Grid Param			
Grid selection	Connect	IP	F(W) V(W)/V(Q) P(Q)/P(F)
Over frequency		Droop F	42%PE/Hz
Start freq F	60.04Hz	Stop freq F	60.04Hz
Start delay	0.50s	Stop delay	0.50s
Under frequency		Droop F>	42%PE/Hz
Start freq F>	59.96Hz	Stop freq F>	59.96Hz
Start delay F>	0.50s	Stop delay F>	0.50s
CANCEL		OK	

F(W)

Note: The precision of the values shown in the **F(W)** screen is capped at two decimals.

- Take a picture of the Volt-Watt and Volt-Var **V(W)/V(Q)** Screen where V(W) and V(Q) are both checked.

The screenshot shows the 'Grid Param' dialog box with the 'V(W)/V(Q)' tab selected. Both 'V(W)' and 'V(Q)' checkboxes are checked. The 'Response_T' is set to '5S'. The 'V' values for four phases are: V1:106.0%, V2:110.0%, V3:110.0%, V4:110.0%. The 'Q' values are: Q1:44%, Q2:0%, Q3:0%, Q4:-44%. The 'L.in' is 5.0% and 'L.out' is 20.0%. Buttons for 'CANCEL' and 'OK' are at the bottom.

Grid selection	Connect	IP	F(W)	V(W)/V(Q)	P(Q)/P(F)
		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Response_T		5S			
V1:106.0%	P1:100%	L.in:5.0%		L.out:20.0%	
V2:110.0%	P2:0%	V1:92.0%	Q1:44%		
V3:110.0%	P3:0%	V2:98.0%	Q2:0%		
V4:110.0%	P4:0%	V3:100.0%	Q3:0%		
		V4:106.0%	Q4:-44%		
CANCEL		OK			

- If Watt-Var or P(Q) must be enabled, it can be found under the **P(Q)/P(F)** tab. "Q" value can be set to absorb or inject.

The screenshot shows the 'Grid Param' dialog box with the 'P(Q)/P(F)' tab selected. Both 'P(Q)' and 'P(F)' checkboxes are unchecked. The 'P' values for four phases are: P1:20%, P2:50%, P3:100%, P4:100%. The 'Q' values are: Q1:-100%, Q2:-100%, Q3:-100%, Q4:-100%. The 'L.in' is 50.0% and 'L.out' is 100.0%. The 'F' values are: F1:1.000, F2:0.800, F3:0.800, F4:0.800. Buttons for 'CANCEL' and 'OK' are at the bottom.

Grid selection	Connect	IP	F(W)	V(W)/V(Q)	P(Q)/P(F)
		<input type="checkbox"/>			<input type="checkbox"/>
P(Q)		P(F)			
		L.in:50.0%			
P1:20%	Q1:-100%	L.out:100.0%			
P2:50%	Q2:-100%	P1:50.0%	F1:1.000		
P3:100%	Q3:-100%	P2:100.0%	F2:0.800		
P4:100%	Q4:-100%	P3:100.0%	F3:0.800		
		P4:100.0%	F4:0.800		
CANCEL		OK			

9. Take a picture of the **Limitier** Tab. Check Grid Sell.

Grid Param		Time	Power(W)	Batt	Charge	Sell
<input checked="" type="checkbox"/>	Grid Sell 60000	01:00AM	2000	50%	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Limited Power to Home	05:00AM	2000	50%	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Limited Power to Load	09:00AM	2000	100%	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Time of Use Setup	01:00PM	2000	100%	<input type="checkbox"/>	<input type="checkbox"/>
		05:00PM	2000	50%	<input type="checkbox"/>	<input type="checkbox"/>
		09:00PM	2000	50%	<input type="checkbox"/>	<input type="checkbox"/>