# GRID PROFILE SETTINGS FOR THE Q.HOME HYBRID INVERTER

# POWER QUALITY RESPONSE MODES FOR DNSPS (VOLT VAR, VOLT WATT AND VOLTAGE)

Q CELLS Australia | Sep 2020

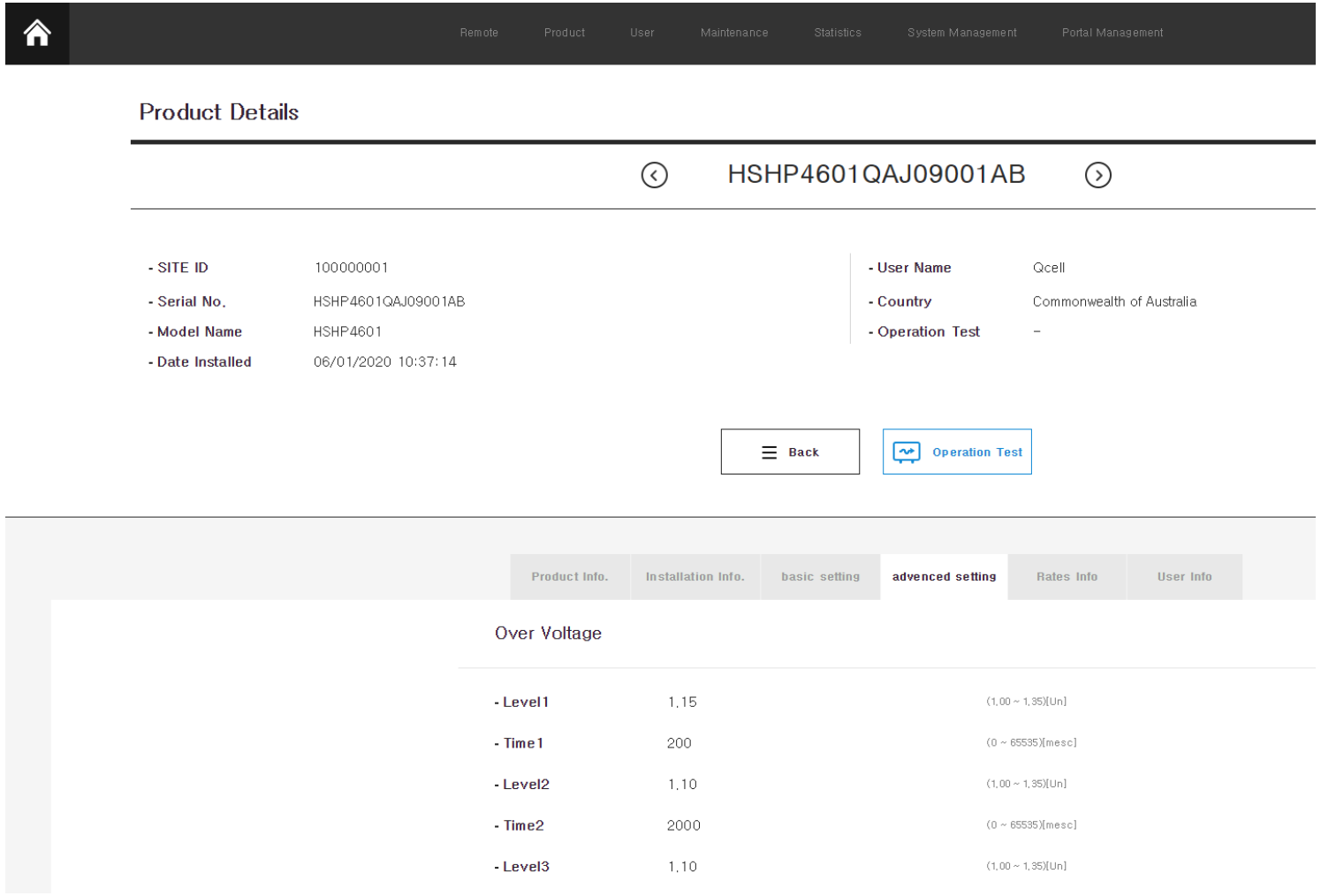
Q CELLS
Engineered in Germany

# ACCESSING SIM MANAGER (PROGRAM GRID SETTINGS) - ONSITE

Link to commissioning guide: https://youtu.be/KHnoCo-WIOQ?t=706

# CHANGE GRID SETTINGS ONLINE – ON-CLOUD

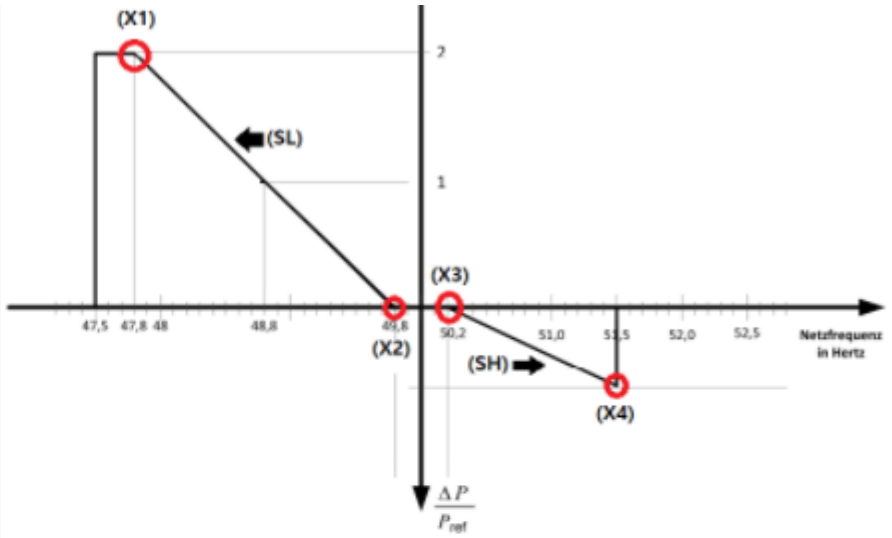
## Login installer account, then visit: https://au.qhomestory.com/installer/prod/list1/goView.do?deviceId=[serial number]

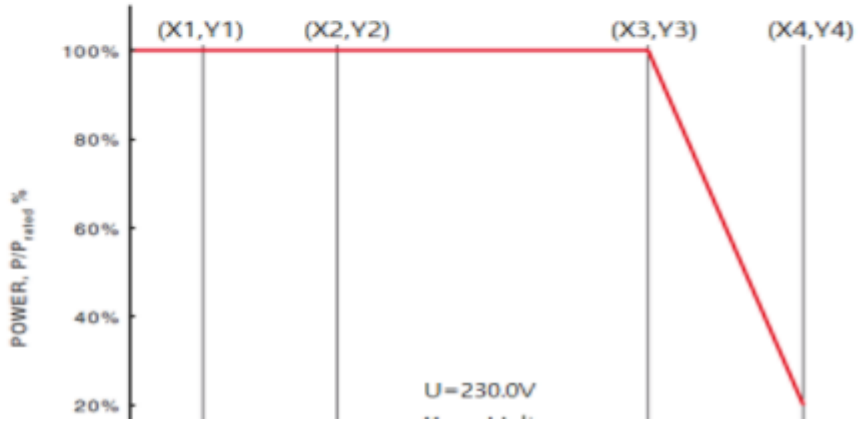


# DEFAULT VALUES

| Grid Control | |
|---|---|
| 10 Min Voltage | |
| Level | 1.10 [Un] (* Range : 1.06 ~ 1.12) |

| Grid Control (Active) | |
|---|---|
| Active Power SetPoint | |
| SetPoint | ○ Enable ◉ Disable |
| SetPoint Value: | 100 [%] (* Range : 0 ~ 100) |
| Active Power Frequency | |
| X1: Frequency | 49.00 [Hz] (* Range : 47.00 ~ 49.00) |
| X2: Frequency | 49.75 [Hz] (* Range : 49.75 / Fixed) |
| X3: Frequency | 50.25 [Hz] (* Range : 50.25 / Fixed) |
| X4: Frequency | 52.00 [Hz] (* Range : 51.00 ~ 52.00) |
| Active Power Voltage | |
| Voltage | ◉ Enable ○ Disable |
| X1: Voltage | 0.9 [Un] (* Range : 0.9 / Fixed ) |
| X2: Voltage | 0.96 [Un] (* Range : 0.93 ~ 1.00) |
| X3: Voltage | 1.09 [Un] (* Range : 1.02 ~ 1.11) |
| X4: Voltage | 1.15 [Un] (* Range : 1.06 ~ 1.15) |

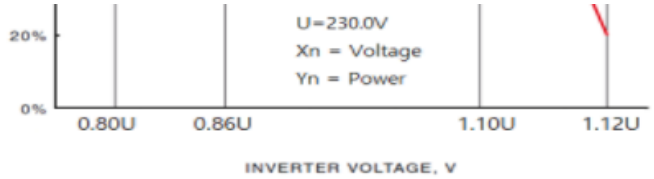


# DEFAULT VALUES

| Grid Control (Reactive) | |
|---|---|
| **Reactive Power SetPoint** | |
| SetPoint | ○ Enable ◉ Disable |
| SetPoint Excited | ○ Over ◉ Under |
| SetPoint Value | 1.00 [Power Factor] (*Range : 0.80 ~ 1.00) |
| **Reactive Power Cospi(P)** | |
| Cospi(P) | ○ Enable ◉ Disable |
| Cospi(P) Excited | ○ Over ◉ Under |
| **Reactive Power Q(SetPoint)** | |
| Q(SetPoint) | ○ Enable ◉ Disable |
| Q(SetPoint) Excited | ○ Over ◉ Under |
| SetPoint Value: | 0.000 [Q/S] (* Range : 0 ~ 0.600) |
| **Reactive Power Q(U)** | |
| Q(U) | ○ Enable ◉ Disable |
| X1: Voltage | 0.9 [Un] (* Range : 0.9 / Fixed ) |
| Y1: Reactive | -30.00 [%] (* Range : -60.00 ~ 0.00) |
| X2: Voltage | 0.9565 [Un] (* Range : 0.9391 ~ 1.0000) |
| Y2: Reactive | 0.0 [%] (* Range : 0.00 / Fixed ) |
| X3: Voltage | 1.0860 [Un] (* Range : 1.0217 ~ 1.1087) |
| Y3: Reactive | 0.0 [%] (* Range : 0.00 / Fixed ) |
| X4: Voltage | 1.1522 [Un] (* Range : 1.0609 ~ 1.1522) |
| Y4: Reactive | 30.00 [%] (* Range : 0.00 ~ 60.00) |

| Gradient Control | |
|---|---|
| Energy Source Change | ○ Enable ◉ Disable |
| Time Level | 360 [sec] (* Range : 60 ~ 1200) |



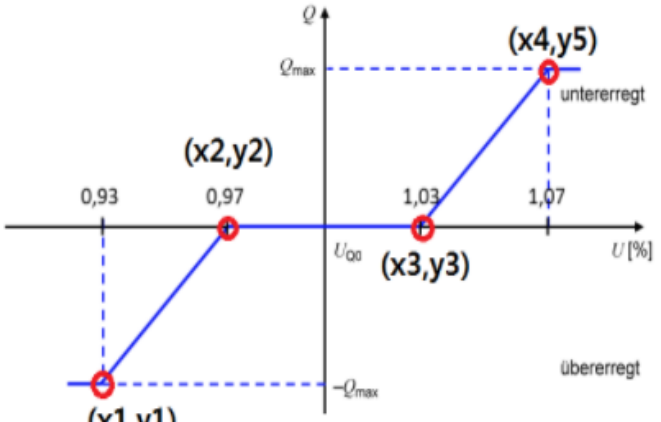




Bild 9 – Standard-*Q*(*U*)-Kennlinie

# AUSNet, CITIPOWER, Powercor, United Energy, Jemena

## Victorian Distribution Network Service Provider (DNSP) Basic Micro EG Connections Power Quality Response Mode settings

Victorian DNSPs are mandating power quality response mode capability, and associated settings for all micro EG connections from 1 December 2019. The settings are:

- Volt-var response mode (AS/NZS 4777.2 Table 11); and
- Volt-watt response mode (AS/NZS 4777.2 Table 10)

Settings for the power quality response modes are shown below

**Table 1: Mandatory: volt-var response mode settings**

| Reference | Voltage in Volts | Var % Rated VA |
|---|---|---|
| V1 | 208 | 44% leading (exporting vars) |
| V2 | 220 (default) | 0% |
| V3 | 241 | 0% |
| V4 | 253 | 44% lagging (sinking vars, 3.7% per volt, 0.9 power factor) |

**Table 2: Mandatory volt-watt response mode settings**

| Reference | Voltage in Volts | Power % rated Power |
|---|---|---|
| V1 | 207 (default) | 100% (default) |
| V2 | 220 (default) | 100% (default) |
| V3 | 253 | 100% (default) |
| V4 | 259 | 20% (default, 5.3%/volt) |

**Table 3: Sustained operation for voltage variation**

| Reference | Voltage |
|---|---|
| V nom-max | 258 volts |

The applicant/electrical contractor/installer must ensure the Victorian power quality response modes have been set in the inverter(s) and must not be changed without written approval from the relevant DNSP. All other settings are as per the default settings in AS4777.2. These required settings must be validated and tested by the electrical contractor/ installer.

# AUSNET, CITIPOWER, POWERCOR, UNITED ENERGY, JEMENA

| Grid Control | |
|---|---|
| 10 Min Voltage | |
| Level | 1.12 [Un] (* Range : 1.06 ~ 1.12) |

| Grid Control (Active) | |
|---|---|
| Active Power SetPoint | |
| SetPoint | ○ Enable ◉ Disable |
| SetPoint Value: | 100 [%]<br>(* Range : 0 ~ 100) |
| Active Power Frequency | |
| X1: Frequency | 49.00 [Hz]<br>(* Range : 47.00 ~ 49.00) |
| X2: Frequency | 49.75 [Hz]<br>(* Range : 49.75 / Fixed) |
| X3: Frequency | 50.25 [Hz]<br>(* Range : 50.25 / Fixed) |
| X4: Frequency | 52.00 [Hz]<br>(* Range : 51.00 ~ 52.00) |
| Active Power Voltage | |
| Voltage | ◉ Enable ○ Disable |
| X1: Voltage | 0.9 [Un]<br>(* Range : 0.9 / Fixed ) |
| X2: Voltage | 0.96 [Un]<br>(* Range : 0.93 ~ 1.00) |
| X3: Voltage | 1.1 [Un]<br>(* Range : 1.02 ~ 1.11) |
| X4: Voltage | 1.126 [Un]<br>(* Range : 1.06 ~ 1.15) |

| Grid Control (Reactive) | |
|---|---|
| Reactive Power SetPoint | |
| SetPoint | ◉ Enable ○ Disable |
| SetPoint Excited | ○ Over ◉ Under |
| SetPoint Value | 0.9 [Power Factor]<br>(*Range : 0.80 ~ 1.00) |
| Reactive Power Cospi(P) | |
| Cospi(P) | ○ Enable ◉ Disable |
| Cospi(P) Excited | ○ Over ◉ Under |
| Reactive Power Q(SetPoint) | |
| Q(SetPoint) | ○ Enable ◉ Disable |
| Q(SetPoint) Excited | ○ Over ◉ Under |
| SetPoint Value: | 0.000 [Q/S]<br>(* Range : 0 ~ 0.600) |
| Reactive Power Q(U) | |
| Q(U) | ◉ Enable ○ Disable |
| X1: Voltage | 0.9 [Un]<br>(* Range : 0.9 / Fixed ) |
| Y1: Reactive | -44.00 [%]<br>(* Range : -60.00 ~ 0.00) |
| X2: Voltage | 0.9565 [Un]<br>(* Range : 0.9391 ~ 1.0000) |
| Y2: Reactive | 0.0 [%]<br>(* Range : 0.00 / Fixed ) |
| X3: Voltage | 1.0478 [Un]<br>(* Range : 1.0217 ~ 1.1087) |
| Y3: Reactive | 0.0 [%]<br>(* Range : 0.00 / Fixed ) |
| X4: Voltage | 1.1 [Un]<br>(* Range : 1.0609 ~ 1.1522) |
| Y4: Reactive | 44.00 [%]<br>(* Range : 0.00 ~ 60.00) |

# Energex & Ergon

## Power Quality Response Modes - IES

### Vnom_max

| Reference | Voltage Setting |
|---|---|
| Vnom_max | 258 V |

### volt-var

| Reference | Voltage | var % rated VA | Power Factor |
|---|---|---|---|
| $V_1$ | 207 V | 44% | 0.9 leading |
| $V_2$ | 220 V | 0% | 1 |
| $V_3$ | 240 V | 0% | 1 |
| $V_4$ | 258 V | 60% | 0.8 lagging |

### volt-watt

| Reference | Voltage | Max value (P/ $P_{rated}$), % |
|---|---|---|
| $V_1$ | 207 V | 100% |
| $V_2$ | 220 V | 100% |
| $V_3$ | 253 V | 100% |
| $V_4$ | 260 V | 20% |

# ENERGEX & ERGON

| Grid Control | |
|---|---|
| 10 Min Voltage | |
| Level | 1.12 [Un] (* Range : 1.06 ~ 1.12) |

| Grid Control (Active) | |
|---|---|
| Active Power SetPoint | |
| SetPoint | ○ Enable ◉ Disable |
| SetPoint Value: | 100 [%] (* Range : 0 ~ 100) |
| Active Power Frequency | |
| X1: Frequency | 49.00 [Hz] (* Range : 47.00 ~ 49.00) |
| X2: Frequency | 49.75 [Hz] (* Range : 49.75 / Fixed) |
| X3: Frequency | 50.25 [Hz] (* Range : 50.25 / Fixed) |
| X4: Frequency | 52.00 [Hz] (* Range : 51.00 ~ 52.00) |
| Active Power Voltage | |
| Voltage | ◉ Enable ○ Disable |
| X1: Voltage | 0.9 [Un] (* Range : 0.9 / Fixed ) |
| X2: Voltage | 0.96 [Un] (* Range : 0.93 ~ 1.00) |
| X3: Voltage | 1.1 [Un] (* Range : 1.02 ~ 1.11) |
| X4: Voltage | 1.1304 [Un] (* Range : 1.06 ~ 1.15) |

| Grid Control (Reactive) | |
|---|---|
| Reactive Power SetPoint | |
| SetPoint | ◉ Enable ○ Disable |
| SetPoint Excited | ○ Over ◉ Under |
| SetPoint Value | 0.9 [Power Factor] (*Range : 0.80 ~ 1.00) |
| Reactive Power Cospi(P) | |
| Cospi(P) | ○ Enable ◉ Disable |
| Cospi(P) Excited | ○ Over ◉ Under |
| Reactive Power Q(SetPoint) | |
| Q(SetPoint) | ○ Enable ◉ Disable |
| Q(SetPoint) Excited | ○ Over ◉ Under |
| SetPoint Value: | 0.000 [Q/S] (* Range : 0 ~ 0.600) |
| Reactive Power Q(U) | |
| Q(U) | ◉ Enable ○ Disable |
| X1: Voltage | 0.9 [Un] (* Range : 0.9 / Fixed ) |
| Y1: Reactive | -44.00 [%] (* Range : -60.00 ~ 0.00) |
| X2: Voltage | 0.9565 [Un] (* Range : 0.9391 ~ 1.0000) |
| Y2: Reactive | 0.0 [%] (* Range : 0.00 / Fixed ) |
| X3: Voltage | 1.04347 [Un] (* Range : 1.0217 ~ 1.1087) |
| Y3: Reactive | 0.0 [%] (* Range : 0.00 / Fixed ) |
| X4: Voltage | 1.1217 [Un] (* Range : 1.0609 ~ 1.1522) |
| Y4: Reactive | 60.00 [%] (* Range : 0.00 ~ 60.00) |

# SA Power Networks

## Sustained operation for Voltage variations (Clause 7.5.2 of AS4777)

| Reference | Voltage in volts |
|---|---|
| Vnom-max | 258 |

Volt-VAr response mode (Table 9 of AS4777)

| Reference | Voltage in volts | VAr % rated VA |
|---|---|---|
| V1 | 207 (default) | 31% leading (sourcing vars, 2.4%/volt) |
| V2 | 220 (default) | 0 |
| V3 | 248 | 0 |
| V4 | 253 | 44% lagging (sinking vars, 8.8%/volt) |

In addition to the above settings, also apply a Volt-Watt response mode as per below if the inverter allows this.

| Reference | Voltage in volts | Power % rated power |
|---|---|---|
| V1 | 207 (default) | 100% (default) |
| V2 | 220 (default) | 100% (default) |
| V3 | 250 (default) | 100% (default) |
| V4 | 265 (default) | 20% (default, 5.3%/volt) |

# SA POWER NETWORKS

| Grid Control (Active) | |
|---|---|
| Active Power SetPoint | |
| SetPoint | ○ Enable ◉ Disable |
| SetPoint Value: | 100 [%]<br>(* Range : 0 ~ 100) |
| Active Power Frequency | |
| X1: Frequency | 49.00 [Hz]<br>(* Range : 47.00 ~ 49.00) |
| X2: Frequency | 49.75 [Hz]<br>(* Range : 49.75 / Fixed) |
| X3: Frequency | 50.25 [Hz]<br>(* Range : 50.25 / Fixed) |
| X4: Frequency | 52.00 [Hz]<br>(* Range : 51.00 ~ 52.00) |
| Active Power Voltage | |
| Voltage | ◉ Enable ○ Disable |
| X1: Voltage | 0.9 [Un]<br>(* Range : 0.9 / Fixed ) |
| X2: Voltage | 0.9565 [Un]<br>(* Range : 0.93 ~ 1.00) |
| X3: Voltage | 1.08696 [Un]<br>(* Range : 1.02 ~ 1.11) |
| X4: Voltage | 1.1522 [Un]<br>(* Range : 1.06 ~ 1.15) |

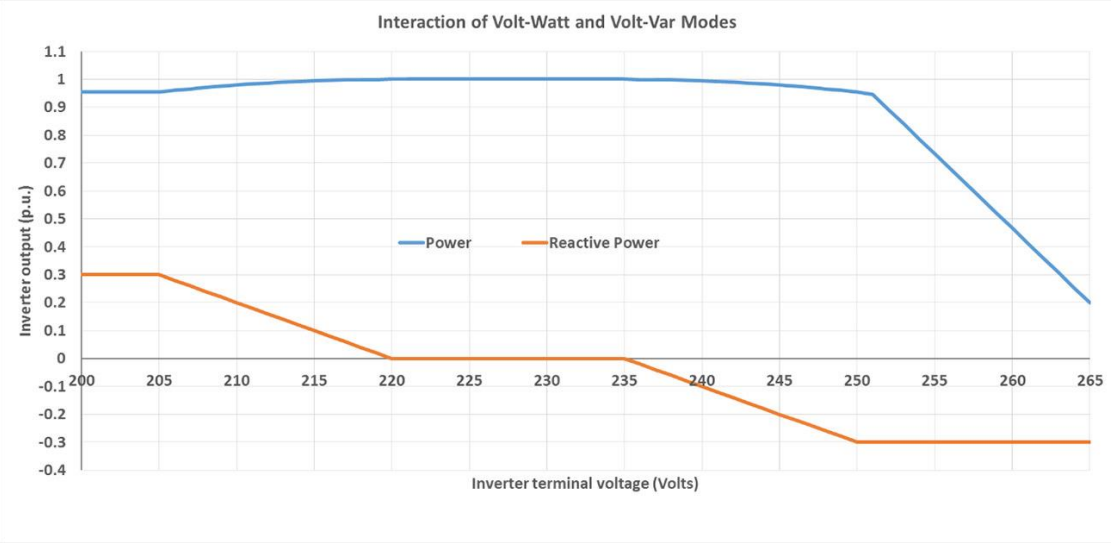
| Grid Control (Reactive) | |
|---|---|
| Reactive Power SetPoint | |
| SetPoint | ◉ Enable ○ Disable |
| SetPoint Excited | ○ Over ◉ Under |
| SetPoint Value | 0.9 [Power Factor]<br>(*Range : 0.80 ~ 1.00) |
| Reactive Power Cospi(P) | |
| Cospi(P) | ○ Enable ◉ Disable |
| Cospi(P) Excited | ○ Over ◉ Under |
| Reactive Power Q(SetPoint) | |
| Q(SetPoint) | ○ Enable ◉ Disable |
| Q(SetPoint) Excited | ○ Over ◉ Under |
| SetPoint Value: | 0.000 [Q/S]<br>(* Range : 0 ~ 0.600) |
| Reactive Power Q(U) | |
| Q(U) | ◉ Enable ○ Disable |
| X1: Voltage | 0.9 [Un]<br>(* Range : 0.9 / Fixed ) |
| Y1: Reactive | -31.00 [%]<br>(* Range : -60.00 ~ 0.00) |
| X2: Voltage | 0.9565 [Un]<br>(* Range : 0.9391 ~ 1.0000) |
| Y2: Reactive | 0.0 [%]<br>(* Range : 0.00 / Fixed ) |
| X3: Voltage | 1.07826 [Un]<br>(* Range : 1.0217 ~ 1.1087) |
| Y3: Reactive | 0.0 [%]<br>(* Range : 0.00 / Fixed ) |
| X4: Voltage | 1.1 [Un]<br>(* Range : 1.0609 ~ 1.1522) |
| Y4: Reactive | 44 [%]<br>(* Range : 0.00 ~ 60.00) |

# Western Power

In addition to these, it is allowed for the sustained over-voltage setting to be increased to 258V where it's needed to prevent nuisance tripping and reduce any frustration that customers may have after the inverter system is installed.

Western Power required volt-var settings from 9 August 2019

| Reference value | Required voltage value (volts) | Reactive power required of inverter rating (p.u.) | Var type |
|---|---|---|---|
| V1 | 205 | 0.3 | Var source or generator |
| V2 | 220 | 0.0 | No Var |
| V3 | 235 | 0.0 | No Var |
| V4 | 250 | 0.3 | Var sink or load |



# WESTERN POWER

| Grid Control | |
|---|---|
| 10 Min Voltage | |
| Level | 1.12 [Un] (* Range : 1.06 ~ 1.12) |

| Grid Control (Active) | |
|---|---|
| Active Power SetPoint | |
| SetPoint | ○ Enable ◉ Disable |
| SetPoint Value: | 100 [%] (* Range : 0 ~ 100) |
| Active Power Frequency | |
| X1: Frequency | 49.00 [Hz] (* Range : 47.00 ~ 49.00) |
| X2: Frequency | 49.75 [Hz] (* Range : 49.75 / Fixed) |
| X3: Frequency | 50.25 [Hz] (* Range : 50.25 / Fixed) |
| X4: Frequency | 52.00 [Hz] (* Range : 51.00 ~ 52.00) |
| Active Power Voltage | |
| Voltage | ◉ Enable ○ Disable |
| X1: Voltage | 0.9 [Un] (* Range : 0.9 / Fixed ) |
| X2: Voltage | 0.96 [Un] (* Range : 0.93 ~ 1.00) |
| X3: Voltage | 1.09 [Un] (* Range : 1.02 ~ 1.11) |
| X4: Voltage | 1.15 [Un] (* Range : 1.06 ~ 1.15) |

| Grid Control (Reactive) | |
|---|---|
| Reactive Power SetPoint | |
| SetPoint | ◉ Enable ○ Disable |
| SetPoint Excited | ○ Over ◉ Under |
| SetPoint Value | 0.9 [Power Factor] (*Range : 0.80 ~ 1.00) |
| Reactive Power Cospi(P) | |
| Cospi(P) | ○ Enable ◉ Disable |
| Cospi(P) Excited | ○ Over ◉ Under |
| Reactive Power Q(SetPoint) | |
| Q(SetPoint) | ○ Enable ◉ Disable |
| Q(SetPoint) Excited | ○ Over ◉ Under |
| SetPoint Value: | 0.000 [Q/S] (* Range : 0 ~ 0.600) |
| Reactive Power Q(U) | |
| Q(U) | ◉ Enable ○ Disable |
| X1: Voltage | 0.9 [Un] (* Range : 0.9 / Fixed ) |
| Y1: Reactive | -30 [%] (* Range : -60.00 ~ 0.00) |
| X2: Voltage | 0.9565 [Un] (* Range : 0.9391 ~ 1.0000) |
| Y2: Reactive | 0.0 [%] (* Range : 0.00 / Fixed ) |
| X3: Voltage | 1.02174 [Un] (* Range : 1.0217 ~ 1.1087) |
| Y3: Reactive | 0.0 [%] (* Range : 0.00 / Fixed ) |
| X4: Voltage | 1.08696 [Un] (* Range : 1.0609 ~ 1.1522) |
| Y4: Reactive | 30 [%] (* Range : 0.00 ~ 60.00) |

# REMEMBER TO SAVE!

MENU LIST

BMS Setting

Install Setting

Operating Test

- HSPV4601 8.0kWh
- PMS S/W : P02.00.08
  Jun 5 2019 - 1P_ESS

Install Setting Menu

**Country / Region Information**

| | |
|---|---|
| S/N : | HSHP4601QAJ09001AB |
| Country: Australia | Region : Sydney |

Country / Region Config

SAVE and ReSTART

**Product Information**

| | |
|---|---|
| installed PV-1 Power: | 3300 [W]<br>* Range : 1000 ~ 3300 W,<br>* "0" : the PV1 is not installed) |
| installed PV-2 Power: | 3300 [W]<br>* Range : 1000 ~ 33000 W,<br>* "0" : the PV2 is not installed) |
| Feed In Limit percentage | 100 %<br>* Range : 0 ~ 100 (%)<br>* 100 (%) means "No-Limit Feedin".<br>* 0 (%) means "No Feedin". |
| Automatic Operation type | (•) Smart Mode , ( ) Basic Mode<br>(* The "Smart" type is more advanced Algorithm.) |
| Sleep-Mode | ( ) Enable (•) Disable |
| Battery Count: 1 | |
| PMS External Mode Enable | (•) Enable ( ) Disable |
| Backup Mode(Generator Charge Only) | ( ) Enable (•) Disable |
| Server's IP-address and port | IP: 14.34.15.211 \| Port: 80 |

**Smart Meter Selection**

Meter Type : RS485

**D0 - Meter Model Selection**

D0-Bi/Feed-In: EM112-DIN.AV0.1.X.S1.X(Gavazzi)

# THANK YOU

Q CELLS
Engineered in Germany