



# CERTIFICATE

**Applicant:** Victron Energy B.V.  
De Paal 35  
1351 JG Almere  
Netherlands

**Product:** Bi-Directional Battery Inverter

**Model:** Quattro-II 48/5000/70-50/50 230V

**Rating:**

DC charge:	48VDCnom., 70Amax
DC discharge:	48VDCnom., 110Amax
AC discharge:	230V, 19Amax, 50/60Hz, 1Ph+N+PE
Pass through current:	50A
Output power (Feed in On-Grid):	4,5kVA / 4,4kW
Output power (Off Grid):	5,0kVA / 4,0kW

### Intended use:

Bi-Directional Battery Inverter with an automatic disconnection device with single-phase mains surveillance in accordance with Technical Regulation 3.3.1 Revision 2 18.12.2019 for plants with a single-phase coupling via an inverter to the public mains supply. The automatic disconnection device is an integral part of the aforementioned inverter.

### Applied standards and guidelines:

**SOP-9-1\_15 GCC Certification Program, 09/21**

Based on:

**Technical Regulation 3.3.1 Revision 2 18.12.2019**

Technical regulation 3.3.1 for battery plants - category A, SA

The safety concept of an aforementioned representative product corresponds at the time of issue of this certificate to the valid safety specifications for the specified use in accordance with regulations.

#### Limitations:

- The Quattro-II 48/5000/70-50/50 230V have a current limited to 16A.
- Complies with the requirements of Category A.
- The Ramp rate constraint (load ramp rate – ramp function) is not implemented.
- The minimum adjustable Undervoltage threshold down to 0,78Un. Under that voltage the unit disconnect without intentional delay.
- The maximum adjustable Overvoltage threshold is up to 1,26Un. Above that voltage the unit disconnect without intentional delay.

**Report No:** 22PP102-12\_0

**Certificate No:** 23-496-00

**Date of issue:** 2023-12-13

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Certification Engineer





## B1.2 Documentation for category A energy storage facilities

### B1.2.1. Identification

Facility	Description of the facility
Not part of this certificate	Not part of this certificate
Facility owner name and address	Not part of this Certificate
Facility owner telephone no.	Not part of this Certificate
Facility owner e-mail	Not part of this Certificate
Inverter - manufacturer	Victron Energy
Inverter – rated power	Quattro-II 48/5000/70-50/50 230V 5,0kVA / 4,0kW
Storage medium – manufacturer	-
Storage medium – model no.	-
Storage medium – useable energy storage capacity [kWh]	-

### B1.2.2. Normal operation

<p>Can the facility be started and operate continuously within the normal operation range, restricted only by protective settings, c.f. requirements in section 7?</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>
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### B1.2.3. Tolerance of frequency deviations

<p>Will the energy storage facility remain connected to the public electricity supply grid during frequency deviations as specified in section 4?</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>
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### B1.2.4. Start-up and reconnection of a power-generating plant

<p>Does start-up and automatic reclosing occur after three minutes following voltage and frequency coming within the areas specified in section 4.3.1?</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>
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### B1.2.5. Power quality

For each power quality parameter, please state how the result was achieved.

#### B1.2.5.1. Rapid voltage changes

<p>Does the energy storage facility comply with the rapid voltage changes threshold specified in section 5.1.1.3?</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>
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#### B1.2.5.2. DC content

<p>Does DC content at normal operation exceed 0.5% of rated current?</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input type="checkbox"/></p> <p>No <input checked="" type="checkbox"/></p>
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### B1.2.5.3. Current imbalance

<p>Does the current imbalance at normal operation exceed 16 A?</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input type="checkbox"/></p> <p>No <input checked="" type="checkbox"/></p>
<p>If the facility is made up of single-phase energy storage units, have measures been taken to ensure that the above threshold is not exceeded?</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>

### B1.2.5.4. Flicker

<p>Is the flicker contribution for the entire facility below the threshold specified in section 5.1.1.4? Only the information for the tested unit is available, not for the whole facility. The limits depend on the number of energy storage facilities.</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>
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### B1.2.5.5. Harmonics

<p>Are all harmonics for the entire facility below the thresholds specified in section 5.1.1.5? Only the information for the tested unit is available, not for the whole facility. The limits depend on the SCR.</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>
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### B1.2.5.6. Interharmonics

This part must only be filled in for energy storage facilities larger than 50 kW.

<p>Are all interharmonics for the entire facility below the threshold specified in section 5.1.1.6? Only the information for the tested unit is available, not for the whole facility. The limits depend on the SCR.</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>
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### B1.2.5.7. Disturbances in the 2-9 kHz range

This part must only be filled in for energy storage facilities larger than 50 kW.

<p>Is the emission of disturbances with frequencies in the 2-9 kHz range lower than 0.2% of the rated current <math>I_n</math> as required in section 5.1.1.7? Only the information for the tested unit is available, not for the whole facility. The limits depend on the SCR.</p>	Yes <input type="checkbox"/> No <input type="checkbox"/>
<p>Where to find documentation that this requirement has been met?          Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	

## B1.2.6. Control functions

### B1.2.6.1. Active power control

#### B.1.2.6.1.1. Frequency response at overfrequency

<p>Is the energy storage facility equipped with a frequency response function in case of overfrequency? Only the information for the tested unit is available, not for the whole facility.</p>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<p>Where to find documentation that this requirement has been met?          Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	

#### B.1.2.6.1.2. Absolute power constraint

<p>Is the energy storage facility equipped with an absolute power constraint function? Only the information for the tested unit is available, not for the whole facility.</p>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<p>Where to find documentation that this requirement has been met?          Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	

#### B.1.2.6.1.3. Ramp rate constraint function

<p>Is the energy storage facility equipped with a ramp rate constraint function? Only the information for the tested unit is available, not for the whole facility.</p>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<p>Where to find documentation that this requirement has been met?          This requirement is no met.</p>	



### B1.2.6.2. Reactive power control

#### B.1.2.6.2.1. Work area

<p>Can the energy storage facility supply reactive power at <math>P_n</math> and varying operating voltages, as specified in section 6.3? Only the information for the tested unit is available, not for the whole facility.</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>
<p>Can the energy storage facility supply reactive power at varying active power as specified in section 6.3? Only the information for the tested unit is available, not for the whole facility.</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>

#### B.1.2.6.2.2. Power factor control

<p>Is the energy storage facility equipped with a power factor control function as specified in sections 6.3.2 and 6.3.2.1? Only the information for the tested unit is available, not for the whole facility.</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>
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#### B.1.2.6.2.3. Automatic power factor control

<p>Is the energy storage facility equipped with an automatic power factor control as specified in section 6.3.4 and 6.3.4.1? Only the information for the tested unit is available, not for the whole facility.</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>
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#### B.1.2.6.2.4. Q control

<p>Is the energy storage facility equipped with Q control function as specified in section 6.3.1 and 6.3.1.1? Only the information for the tested unit is available, not for the whole facility.</p> <p>Where to find documentation that this requirement has been met? Test report 22PP102-12_0 from Kiwa Primara GmbH</p>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>
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## B1.2.7. Protection against electricity system faults

### B1.2.7.1. Relay settings

The table below lists default values for relay settings. If default values deviate from the values specified in section 7.2.1, documentation must be provided to ensure that relay settings can be set to the correct values upon commissioning.

Protection function	Symbol	Setting		Trip time	
Overvoltage (step 2)	$U_{>>}$	264,50	V	200	ms
Overvoltage (step 1)	$U_{>}$	253,00	V	60	s
Undervoltage (step 1)	$U_{<}$	195,50	V	50	s
Undervoltage (step 2)	$U_{<<}$	184,00	V	200	ms
Overfrequency	$f_{>}$	51,50	Hz	200	ms
Underfrequency	$f_{<}$	47,50	Hz	200	ms
Frequency change	$df/dt$	N/A	Hz/s	N/A	ms

### B1.2.8. Signature

Date	Not part of this certificate
Company	Not part of this certificate
Person responsible for commissioning	Not part of this certificate
Signature (person responsible for commissioning)	Not part of this certificate
Facility owner	Not part of this certificate
Signature (facility owner)	Not part of this certificate