

G83/1-1 – TYPE VERIFICATION TEST SHEET

SSEG DETAILS

| | | | |
|---|---|-------------------|-----------------|
| SSEG Type Reference | SMI 240 SMI 200 | Serial No. | 94300295 |
| SSEG Technology (as per Annex): Type C, Photovoltaic (PV) Inverter | | | |
| Manufacturer | Address | Tel. No. | Fax. No. |
| Enecsys Limited | Harston Mill, Royston Road, Cambridge, CB22 7GG | 01223 792101 | 01223 792103 |
| Technical File Reference No. | | 904-REP-023 | |
| Maximum Export Capability (SSEG Rating Less Parasitic Load) | | 220 W 185 W | |

TEST HOUSE DETAILS

| | |
|---|--|
| Name & Address of Test House | Enecsys Limited Harston Mill, Royston Road, Cambridge, CB22 7GG |
| Tel. No. | 01223 792101 |
| Fax. No. | 01223 792103 |
| E-mail Address | info@enecsys.com |

TEST DETAILS

| | |
|--|--|
| Dates of Test | 09/08/2010 – 13/08/2010 |
| Name of Tester | Simon Mortlock / Andrabadu Viraj |
| Signature of Tester | |
| Approved by (name) | Paul Garrity |
| Approved by (signature) | |
| Test Location (if different from above) | Enecsys Limited Harston Mill, Royston Road, Cambridge, CB22 7GG |

POWER QUALITY

Harmonic Current Emissions (A)

| Harmonic | 2 nd | 3 rd | 5 th | 7 th | 9 th | 11 th | 13 th | 15 th ≤ n ≤ 39 th |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|---|
| Limit | 1.08 | 2.30 | 1.14 | 0.77 | 0.40 | 0.33 | 0.21 | 0.15 x (15/n) |
| Test Value | 0.00543 | 0.0119 | 0.01053 | 0.00688 | 0.00579 | 0.00373 | 0.00325 | Pass |

Voltage Fluctuations and Flicker

Starting/Stopping & Running

| | | | | |
|-------------------|-------------------------------|--------------------|--------------------------------|-----------------------|
| Limit | d_{max} <4% | dc <3.3% | P_{st} < 1.0 | d(t) > 3.3% |
| Test Value | 0.211 | 0.049 | 0.136 | 0 |

DC Injection

Power Factor

| | | | | | | |
|--------------------|---|------------|-------------|---|---------------|---------------|
| G83/1 Limit | 20mA, tested at three power levels | | | 0.95 lag – 0.95 lead at three voltage levels | | |
| Test Level | 10% | 55% | 100% | 215.0V | 232.0V | 255.0V |
| Test Value | 2.2 | 7.8 | 12.1 | 0.9985 | 0.9982 | 0.9976 |

PROTECTION TESTS

Under / Over Frequency

| | Under Frequency | | Over Frequency | |
|-----------------------|------------------------|----------------|-----------------------|----------------|
| Parameter | Frequency | Time | Frequency | Time |
| G83/1 Limit | 47 Hz | 0.5 sec | 50.5 Hz | 0.5 sec |
| Actual Setting | 47.45 | 80mS Max | 50.45 | 80mS Max |
| Trip Value | 47.45 | 10.3mS | 50.45 | 9.2mS |

Under / Over Voltage

| | Under Voltage | | Over Voltage | |
|-----------------------|----------------------|----------------|---------------------|----------------|
| Parameter | Voltage | Time | Voltage | Time |
| G83/1 Limit | 207V | 1.5 sec | 264V | 1.5 sec |
| Actual Setting | 209 | 80mS Max | 259 | 80mS Max |
| Trip Value | 211 | 45.3mS | 263 | 45.4mS |

Loss of Mains Test

| Method Used | Resonant Circuit as per Annex C | | |
|---------------------------|--|----------------|----------------|
| Output Power Level | 10% | 55% | 100% |
| G83/1 Limit | 0.5 sec | 0.5 sec | 0.5 sec |
| Trip Value | 0.305 | 0.348 | 0.357 |

Reconnection Times

| | Under/Over Voltage | Under/Over Frequency | Loss of Mains |
|-----------------------|---------------------------|-----------------------------|----------------------|
| Minimum Value | 180 sec | 180 sec | 180 sec |
| Actual Setting | 182 | 182 | 182 |
| Recorded Value | 182 | 186 | 182 |

FAULT LEVEL CONTRIBUTION

SSEG Short Circuit Parameters

This test is not required as per Clause C4.6 of G83/1 Annex C: As Photovoltaic SSEGs are inverter connected, they are deemed to automatically comply with Clause 5.8 and no further tests are required.

SELF MONITORING – SOLID STATE SWITCHING

Completed as part of Risk Assessment Dangerous Voltages at the Output of the Inverter When Disconnected
PVKey904 – Report reference number 904-REP-013

TEST RESULT

The SMI 240 inverter, Serial No. 94300295 did meet the test requirements set out in clauses C3.1, C3.2, C3.3, C3.4, C3.5, C4.1, C4.2, C4.3 and C4.4 of the type testing Annex C of G83/1.

Note: This certificate summarises the results of tests to G83/1, which are recorded in full in Report No. 904-REP-023.