FORM 2

THE PATENTS ACT, 1970
(39 of 1970)
AND
THE PATENTS RULES, 2003

COMPLETE SPECIFICATION

(See Section 10; rule 13)

TITLE OF THE INVENTION

"SAFETY DEVICE FOR A PHOTOVOLTAIC SYSTEM"

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The following specification particularly describes
the invention and the manner in which
it is to be performed

Claims

1. A safety device (20) for a photovoltaic system for feeding into a power supply system (50), the safety device (20) comprising at least one input (21, 22) for connection to a PV generator (10) and at least one output (23, 24) for connection to an inverter (30), and comprising a switching element (29) for de-energizing the at least one output (23, 24), characterized in that the safety device (20) comprises an evaluating unit (27) which is arranged for switching the switching element (29) in dependence on a low-frequency signal present at the at least one output (23, 24).

2. The safety device (20) as claimed in claim 1, in which the evaluating unit (27) is arranged for measuring the low-frequency signal as a voltage signal.

3. The safety device (20) as claimed in claim 2, comprising a terminal (25) for connection to an earth potential (PE), the evaluating unit (27) being arranged for determining the voltage signal between the at least one output (23, 24) and the earth potential (PE).

4. The safety device (20) as claimed in one of claims 1 to 3, in which the evaluating unit (27) is arranged for measuring the low-frequency signal as a current signal.

5. The safety device (20) as claimed in claim 4, comprising a current measuring device connected to the evaluating unit (27), the evaluating unit (27) being arranged for determining a current flowing via the at least one output (23, 24) as current signal.

6. The safety device (20) as claimed in one of claims 1 to 5, in which the low-frequency signal comprises a frequency which corresponds to an integral multiple of the system frequency in the power supply system (50).

7. The safety device (20) as claimed in claim 6, in which the low-frequency signal comprises a frequency which corresponds at least to once and at most to 10-times the system frequency in the power supply system (50).

8. The safety device (20) as claimed in one of claims 1 to 7, comprising a filter (26), especially a band-pass filter.

9. The safety device (20) as claimed in one of claims 1 to 8, comprising an amplifier (274, 274a, 274b) for the low-frequency signal.

10. The safety device (20) as claimed in one of claims 1 to 9, the safety device (20) being arranged for connecting the at least one input (21, 22) to the at least one output (23, 24) at a signal level above a first threshold value.

11. The safety device (20) as claimed in one of claims 1 to 10, the safety device (20) being arranged for de-energizing the at least one output (23, 24) at a signal level below a second threshold value.

12. The safety device (20) as claimed in claim 10 and 11, the second threshold value being below the first threshold value.

13. The safety device (20) as claimed in one of claims 1 to 12, a de-energizing of the at least one

output (23, 24) taking place via a short circuit of the inputs (21, 22) of the safety device (20).

14. The safety device (20) as claimed in one of claims 1 to 12, a de-energizing of the at least one output (23, 24) taking place via a separating of the connection of the at least one input (21, 22) and the at least one output (23, 24).

15. The safety device (20) as claimed in one of claims 1 to 14, the switching element (29) comprising means for extinguishing an arc.

16. The safety device (20) as claimed in one of claims 1 to 15, comprising a central detection unit (20a) with the evaluating unit (27) and at least one switching unit (20b) with the switching element (29), the central detection unit (20a) and the at least one switching unit (20b) being accommodated in separate housings.

17. A method for operating a safety device (20) for a photovoltaic system for feeding into a power supply system (50), the safety device (20) comprising at least one input (21, 22) for connection to a PV generator (10) and at least one output (23, 24) for connection to an inverter (30), and comprising a switching element (29) for de-energizing the at least one output (23, 24), comprising the following steps:
- determining a level of a low-frequency signal at the at least one output (23, 24);
- connecting the at least one output (23, 24) to the at least one input (21, 22), if the level of the low-frequency signal is above a first threshold value, and

- de-energizing the at least one output (23, 24) if the level of the low-frequency signal is below a second threshold value.

18. The method as claimed in claim 17 in which the level of the low-frequency signal is determined at a frequency which corresponds to an integral multiple of the system frequency in the power supply system (50).

19. The method as claimed in claim 18, in which the low-frequency signal has a frequency which corresponds at least to once and at most to 10-times the system frequency in the power supply system (50).

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