A. Single string PV array connected in series

- Voltage rating:
  - M x 60.7V for PV30 (Max M = 11)
  - M x 60.5V for PV20 (Max M = 16)
  - M x 45.3V for PV15 (Max M = 22)
- Current rating: 10.4 A

B. Connectors must be d.c. rated. They should be touch safe to a standard of ingress protection not less than IP 21, Class 4 and shrouded.

N.B. ENSURE THAT MALE AND FEMALE CONNECTORS ARE FULLY AND SECURELY JOINED.

C. The d.c. isolator must be double pole and rated for the system voltage and current maxima as calculated from the PV array. It should be load-break rated.

D. The inverter must be treated as standard electrical apparatus and earthed as per BS 7671. It must carry a Type Test certificate to the requirements of Engineering Recommendation G83/1 or comply with all other parts of ER G83/1.

Inverter settings:
- Over Voltage: 264V
- Under Voltage: 207V
- Over Frequency: 50.5Hz
- Under Frequency: 47Hz

E. A manual a.c. isolator must be provided located in an accessible position within the Customer’s installation as in G83/1, which is:
- in accordance with BS 60947-3
- must switch all live and neutral conductors
- must be securable in the OFF position only
- must clearly show the OFF and ON positions

F. A main isolator must be provided located in an accessible position within the Customer’s installation as in G83/1, which is:
- in accordance with BS 60947-3
- must switch all live and neutral conductors
- must be securable in the OFF position only
- must clearly show the OFF and ON positions

G. Generation meter should be installed to display record energy delivered by the PV system (kWh). In addition it is highly recommended for instantaneous power output (kW) to be displayed. A kWh meter approved by OFGEM is recommended as it may facilitate payment on ROCs and other Electricity company scheme payments.

H. Installers are obliged to liaise with the relevant distribution Network Operator (DNO) in the following manner:
- Single installation covered by G83/1 - notification of or before day of commissioning followed by G83/1 appendix 2) within 30 days.
- Multiple installations covered by G83/1 - application to proceed (G83/1 appendix 2). On commissioning - notification and appendix 3 as above.

D.C. Cable

Cables must be rated, as a minimum, to the voltage and current ratings derived from the PV array. Standard de-rating factors must also be applied (BS 7671).

A.C. Cable

A.C. cables are to be specified and installed in accordance with BS 7671. The d.c. cable connecting the inverter(s) to the consumer unit should be oversized to minimise voltage drop. A 1% drop or less is recommended.

Lightning Protection

Where there is a perceived increase in risk of direct strike as a consequence of the installation of the PV system, specialists in lightning protection should be consulted with a view to installing a separate lightning protection system in accordance with BS 6651.
A Single PV module
Voltage rating - 150.7V for PV20
60.3V for PV20
45.2V for PV15
Current rating - 10.4A
B Connections must be d.c. rated. They should be touch safe to a standard of ingress protection not less than IP 21, Class II and shrouded. Provided by Viridian Solar.

C The inverter must be treated as standard electrical apparatus and earthed as per BS 7671. It must carry a type test certificate to the requirements of the relevant part of EN 50616:1998 and BS EN 60947.

D The inverter must be isolated from both mains and on-site generation supplies.

E A manual d.c. isolator must be provided located in an accessible position within the Customer’s installation as in G63/1, which is:-
- in accordance with BS EN 60947-3
- must switch all live and neutral conductors,
- must be secure in the OFF position only.

F A main isolator must be provided located in an accessible position within the Customer’s installation as in G63/1, which is:-
- in accordance with BS EN 60947-3
- must switch all live and neutral conductors,
- must be secure in the OFF position only.

G Single phase generation meter should be installed to display/record energy delivered by the PV system (kW). In addition it is recommended for instantaneous power output (kW) to be displayed. A kWh meter approved by OFGEM is recommended as it may facilitate payment on ROCs and other Electricity company schemes.

H Installers are obliged to liaise with the relevant distribution network operator (DNO) in the following manner:
- Single installation covered by G83/1 notification at or before day of commissioning followed by G83/1 paperwork (G83/1 appendix 3) within 30 days.
- Multiple installations covered by G83/1 application to proceed (G83/1 appendix 2). On commissioning notification and appendix 3 as above.

I Lightning Protection
Where there is a perceived increase in risk of direct strike as a consequence of the installation of the PV system, specialists in lightning protection should be consulted with a view to installing a separate lightning protection system in accordance with BS EN 50341.

J D.C. Cable
Cables must be rated, as a minimum, to the voltage and current ratings derived from the PV array. Standard derating factors must also be applied (BS 7671). Cables should be sized such that overall voltage drop at stc between the array and the inverter is <3%.

K A.C. Cable
A.C. cables are to be specified and installed in accordance with BS 7671. The a.c. cable connecting the inverter(s) to the consumer unit should be oversized to minimize voltage drop. A 1% drop or less is recommended.

L V - Do not work on this equipment until it is isolated from both mains and on-site generation supplies.

M Islanding protection
For any installation involving the potential for the PV system to act as an islanding source, the following requirements must be met:
- The inverter must be treated as standard electrical apparatus and earthed as per BS 7671.
- The a.c. cable connecting the inverter(s) to the consumer unit should be oversized to minimize voltage drop. A 1% drop or less is recommended.

N B. ENSURE THAT MALE AND FEMALE CONNECTORS ARE FULLY AND SECURELY JOINED.
Installation on roof

Single strings of M modules in series

A. Single string PV array connected in series
   Voltage rating  
   M x 90.7V for PV30 (Max M = 11)
   M x 82.5V for PV20 (Max M = 16)
   M x 43.2V for PV15 (Max M = 22)

   Current rating  
   N x 10.4 A

   B. Connectors must be d.c. rated. They should be touch safe to a standard of ingress protection not less than IP 21, Class II and shrouded. Provided by Viridian Solar.

   C. The d.c. isolator must be double pole and rated for the system voltage and current, maxima as calculated from the PV array. It should be lock-break-rated. Provided by Viridian Solar.

   N.B. ENSURE THAT MALE AND FEMALE CONNECTORS ARE FULLY AND SECURELY JOINED.

   D. The inverter must be treated as standard electrical apparatus and earthing as per BS 7671 for Class 1. It must carry a Type Test certificate to the requirements of Engineering Recommendation GB51, which are:

   - A manual a.c. isolator must be provided located in an accessible position within the Customer's installation as in GB51, which says:
     - In accordance with BS 6084: 3
     - Use all live and neutral conductors.
     - Must be secure in the OFF position only. It must be simple to secure using a standard padlock device that require a separate removable adaptor or special key to enable them to be secured are not acceptable.
     - Must clearly show the ON and OFF positions

   E. A manual a.c. isolator must be provided located in an accessible position within the Customer's installation as in GB51, which says:

   - In accordance with BS 6084: 3

   - Must switch all live and neutral conductors.

   - Must be secure in the OFF position only. It must be simple to secure using a standard padlock device that require a separate removable adaptor or special key to enable them to be secured are not acceptable.

   - Must clearly show the ON and OFF positions

   F. C3P Protection relay may be required by DNO to protect against voltage change - under and over 240V, frequency change - under and over 50Hz and vector shift - 1 deg increments. If required, this device could be supplied by Viridian Solar at extra cost.

   G. A main isolator must be provided located in an accessible position within the Customer's installation as in GB51, which says:

   - In accordance with BS 6084: 3

   - Must switch all live and neutral conductors.

   - Must be secure in the OFF position only.

   - Must clearly show the ON and OFF positions

   H. Three phase generation meter should be installed to display/record energy delivered by the PV system (kWh). In addition it is highly recommended for instantaneous power output (kW) to be displayed. A kWh meter approved by OTEQ is recommended so it may facilitate payment on ROCs and other Electricity company scheme payments.

   I. Written approval must be gained from Distribution Network Operator (DNO) prior to work. Commissioning in conjunction with DNO engineer, or as required by DNO

   D.C. Cable

   - Cables must be rated, as a minimum, to the voltage and current ratings derived from the PV array. Standard de-rating factors must also be applied (BS 7671). Cables should be sized such that overall voltage drop at stc between the array and the inverter is <3%. Provided by Viridian Solar

   A.C. Cable

   - A.C. cables are to be specified and installed in accordance with BS 7671. The a.c. cable connecting the inverter(s) to the consumer unit should be oversize to minimise voltage drop. A 1% drop or less is recommended.

   Lighting Protection

   - Where there is a perceived increase in risk of direct strike as a consequence of the installation of the PV system, specialists in lightning protection should be consulted with a view to installing a separate lightning protection system in accordance with BS 6651.

Installation in loft

New a.c. Installation

PV array B

T-connector

New a.c. Installation

Existing house a.c. Installation

Main Consumer Unit

Utility meter

G59 Protection relay

AC Supply

PV Distribution Board

4 pole contractor

G59 Relay

Protection

Sensor

DNO Supply

A. Single string PV array connected in series

B. Connectors must be d.c. rated. They should be touch safe to a standard of ingress protection not less than IP 21, Class II and shrouded. Provided by Viridian Solar.

C. The d.c. isolator must be double pole and rated for the system voltage and current, maxima as calculated from the PV array. It should be lock-break-rated. Provided by Viridian Solar.

N.B. ENSURE THAT MALE AND FEMALE CONNECTORS ARE FULLY AND SECURELY JOINED.

D. The inverter must be treated as standard electrical apparatus and earthing as per BS 7671 for Class 1. It must carry a Type Test certificate to the requirements of Engineering Recommendation GB51, which are:

- A manual a.c. isolator must be provided located in an accessible position within the Customer's installation as in GB51, which says:
  - In accordance with BS 6084: 3
  - Use all live and neutral conductors.
  - Must be secure in the OFF position only. It must be simple to secure using a standard padlock device that require a separate removable adaptor or special key to enable them to be secured are not acceptable.
  - Must clearly show the ON and OFF positions

E. A manual a.c. isolator must be provided located in an accessible position within the Customer's installation as in GB51, which says:

- In accordance with BS 6084: 3

- Must switch all live and neutral conductors.

- Must be secure in the OFF position only. It must be simple to secure using a standard padlock device that require a separate removable adaptor or special key to enable them to be secured are not acceptable.

- Must clearly show the ON and OFF positions

F. C3P Protection relay may be required by DNO to protect against voltage change - under and over 240V, frequency change - under and over 50Hz and vector shift - 1 deg increments. If required, this device could be supplied by Viridian Solar at extra cost.

G. A main isolator must be provided located in an accessible position within the Customer's installation as in GB51, which says:

- In accordance with BS 6084: 3

- Must switch all live and neutral conductors.

- Must be secure in the OFF position only.

- Must clearly show the ON and OFF positions

H. Three phase generation meter should be installed to display/record energy delivered by the PV system (kWh). In addition it is highly recommended for instantaneous power output (kW) to be displayed. A kWh meter approved by OTEQ is recommended so it may facilitate payment on ROCs and other Electricity company scheme payments.

I. Written approval must be gained from Distribution Network Operator (DNO) prior to work. Commissioning in conjunction with DNO engineer, or as required by DNO

D.C. Cable

- Cables must be rated, as a minimum, to the voltage and current ratings derived from the PV array. Standard de-rating factors must also be applied (BS 7671). Cables should be sized such that overall voltage drop at stc between the array and the inverter is <3%. Provided by Viridian Solar

A.C. Cable

- A.C. cables are to be specified and installed in accordance with BS 7671. The a.c. cable connecting the inverter(s) to the consumer unit should be oversize to minimise voltage drop. A 1% drop or less is recommended.

Lighting Protection

- Where there is a perceived increase in risk of direct strike as a consequence of the installation of the PV system, specialists in lightning protection should be consulted with a view to installing a separate lightning protection system in accordance with BS 6651.