Romag

Photovoltaic Systems

# Standard PV Module
# Installation & Maintenance Guidelines

PowerGLAZ
ENERGY IN GLASS

# Standard PV Module Installation & Maintenance Guidelines

## Overview

Romag Powerglaz® Standard Module (RSM) modules are available in a polycrystalline solar module.

Modules are available in a range of size and outputs as indicated on the tables enclosed, and are supplied with a fitted frame which can be fixed to a standard roof PV support system.

Modules are tested and certified to IEC 61215 and 61730, application class A and safety class II and should only be assembled in arrays by specialist companies with the necessary expertise. Please comply with the standards and regulations applicable to PV installations in the respective European Code. For example, the VDE provisions (Association for Electrical, Electronic and Information Technologies), the DIN standard (German Institute for Standardisation), the VDEW guidelines (German Electricity Association), and the technical connection conditions of the responsible grid operator and trade association rules concerning accident prevention.

Failure to comply can lead to significant personal injury and equipment damage.

## Labeling

Romag modules are supplied with a label indicating nominal electrical characteristics for that module.

The data supplied on the label is as follows:-

- Manufacturers name
- Max system voltage
- Application class
- Safety class
- Date & place of manufacture
- Voc - Voltage open circuit
- Vmpp - Voltage maximum power point
- Isc - Current short circuit
- Impp - Current maximum power point
- Pmpp - Power maximum power point
- Maximum over-current protection rating

This installation guide is applicable to all Romag modules within the product families listed in the table below:-

| Module Type | Size | Pmpp Range |
|---|---|---|
| RSM 6(60) | 1630 X 986 X 35mm | 235-255W |
| RSM 6(54) | 1472 X 986 X 35mm | 210-230W |
| RSM 6(48) | 1314 X 986 X 35mm | 190-205W |

## Before Installation

This installation guide contains general and safety instruction to be observed when installing and operating Romag Powerglaz® modules.

Read the manual before attempting to install modules. The installed location of solar modules tend to be on roofs where there is a potential for serious injury or death from falling from height.

All installation instructions and site safety procedures must be clearly understood and adhered to while installing, wiring or commissioning or maintaining a solar installation. Failure to comply fully can lead to personal injury and product damage.

This instruction manual is intended for use by qualified persons only.

## Exemption from Liability

Romag will not accept liability or warranty for any damage or personal injury caused by improper installation.

## Safety Signage

The following safety notices will appear as applicable in this manual.

Danger to Life

Electrical Voltage Hazard


Heavy or Bulky Object

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## Safe Handling & General Safety

Accident prevention is paramount when installing a PV system. Romag solar modules must be handled correctly and consideration must be given to the weight and size of modules when installing them.

Modules should be lifted in place using the correct lifting apparatus and with adequate persons to assist.

Installers should always follow the individual safety regulations relevant to the installation site, site conditions and weather conditions

Protective gloves should be worn when handling solar modules. These will protect against sharp edges and burns. The glass surface can heat up under the suns rays which may result in burning of the skin.

Romag Powerglaz® modules have a glass front surface and although it is toughened glass, it can be broken if handled incorrectly.

Always transport and store the module in the original packaging.

- Do not leave the modules unsupported or in a position where they could fall over and be damaged prior to installation.
- Do not step onto the module or put any heavy objects onto any surface of the modules.
- Do not subject the module to excess bending or twisting forces.
- Do not disassemble modules as there are no serviceable parts.
- Do not install modules where flammable gases may be present.
- Do not cover water drainage holes in the frames. Water ingress can lead to frost damage.
- Do not allow the rear surface to be scratched or damaged as this may expose electrical components and circuits, and will lead to failure of the module.

## Electrical Installation & Safety

Romag modules are supplied with Multi Contact junction boxes which have no serviceable parts in.

Do not open or change wiring within a junction box as all wiring is completed in the factory.

Modules may be connected and disconnected when there is no current flowing through the connector under open circuit conditions. Hazardous voltage will be present under normal light conditions.

Romag Solar modules are tested to, and meet the requirements of IEC 61730 Application Class A.

Hazardous Voltage operating at over 120v DC, where unlimited access is areas of general access.

Electrical installation should only be carried out by qualified persons who are trained and competent in the principles of electricity and electrical equipment.

Although there are regional variations, electrical installations should be carried out in accordance with IEC 364 or other relevant standards.

DC wires connected to the modules should be 4mm$^2$ minimum and must be temperature rated at 90°C.

A solar module will generate electricity even on a cloudy day, There is a risk of electric shock at all times. To reduce risk associated with electric shock, the following guidance should be adhered to.

When installing modules, the front surface should be covered to halt or reduce the production of electricity before making an electrical connection.

Never disconnect a system under load. This can cause life threatening arc loads.

Connectors for field assembly should be labelled “Do Not Disconnect Under Load”

Do not touch bare connections in junction boxes or at connection points during installation even if the module is not connected to a system.

Use the correct insulated tools and rubber gloves suitable for working on electrical equipment.

Make sure modules are arranged such that the current and voltage characteristics of the array are within the tolerances of the device to which the array will connect. Solar modules are rated for a maximum system voltage of up to 1000v.

Artificially concentrated sunlight shall not be directed onto a module. This will lead to damage to the module and potential system failure.

Under normal conditions, a photovoltaic module is likely to experience conditions that produce more current and/or voltage than reported at standard test conditions. Accordingly, the values of Isc and Voc advised for a module shall be multiplied by a factor of 1.25 when determining component voltage ratings, conductor current ratings, fuse sizes, and size of controls connected to the PV output.

# Standard PV Module Installation & Maintenance Guidelines

## Array Set up, Series and Parallel Configuration

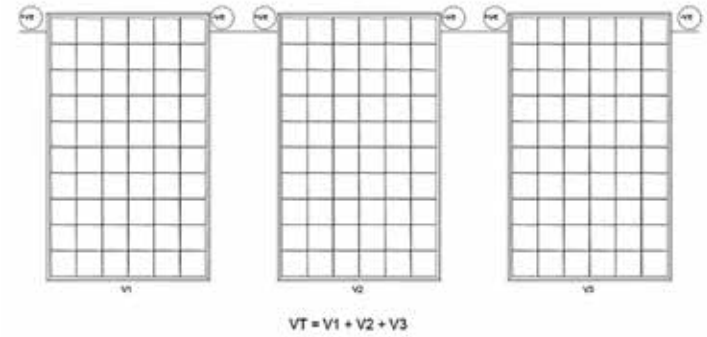
Romag modules are designed to be interconnected to form an array which can be directly connected to the public utility supplier using an inverter device for energy exchange.

When designing the system and connecting to the inverter, the installer should follow the inverter manufacturers instructions.

Modules can be installed in series configuration to increase the voltage or parallel configuration to increase the current. For both configurations, the maximum system voltage must not be exceeded.

## Series Configuration

Series configuration is the preferred configuration for most applications and is used to increase the system voltage. The maximum number of modules in series is dictated by the system design and the inverter selection, and the maximum voltage must not exceed 1000v.

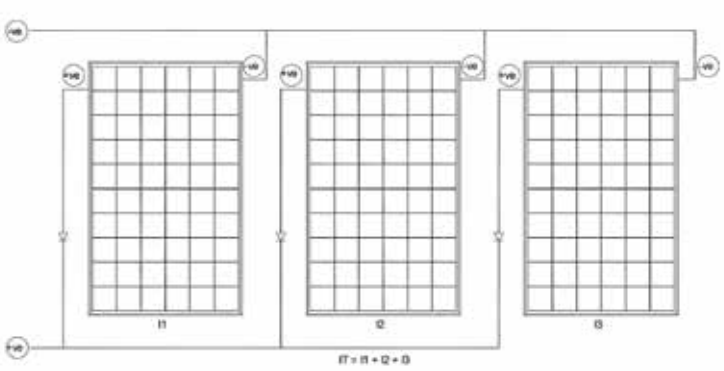



## Parallel Configuration

Parallel configuration is used to increase the system current and for systems with shading issues. Care must be taken to protect the modules when installing in a parallel configuration.

Romag modules are factory fitted with 12A rated bypass diodes. Parallel configurations must be designed so that fuse protection or blocking diodes are incorporated.

The maximum number of solar modules in parallel connection without additional fuse or blocking diodes is one module string. The number of modules in parallel is not restricted provided adequate precautions have been taken to block reverse current.



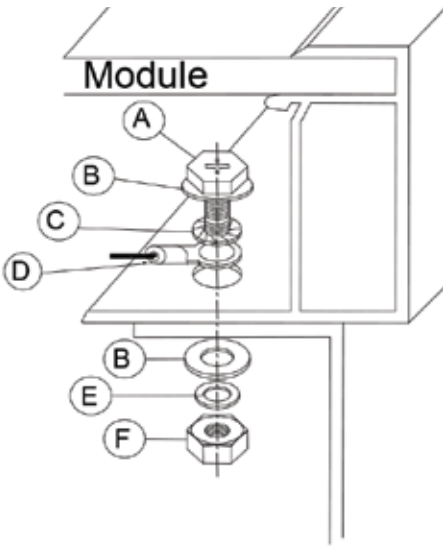
## Earth Bonding & Lightning Protection

To make a PV installation as safe as possible, all exposed metal, (frame, support metalwork, charge controller enclosure etc) should be adequately earthed.

Earthing ensures the accessible parts of the system cannot drift away from ground potential, and thus reduces the risk of electric shock. It also provides a path for lightning induced currents. Romag recommend earthing the modules via one of the earthing holes provided on the frames. The earthing points on the frames are indicated by this logo.

Earthing conductors should be sized in accordance with BS 7671 and lightning conductors in accordance with BS EN62305.

Suggested earthing technique is shown on the drawings.




**A:** M4 Bolt

**B:** M4 Washer

**C:** Serrated washer

**D:** Earth Ground Connector

**E:** M4 Spring Washer

**F:** M4 Nut

In addition to earth bonding the modules, the system should utilise adequate earthing as recommended by the suppliers of other equipment associated with the installation.

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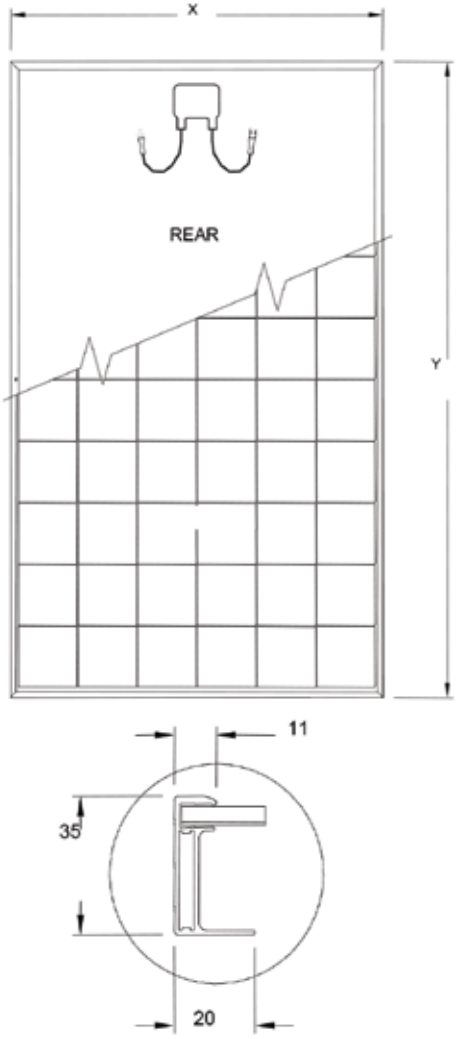
## Mechanical Installation

Fitting of the solar modules should only be carried out by qualified persons who are trained and competent in the principles of PV installations.

Avoid standing on the module or subjecting it to impact during installation. The panels should be lifted into position with appropriate vacuum lifting equipment or craneage.

Installers should always follow the manufacturers instructions relating to specific items supplied.

## Panel Dimensions



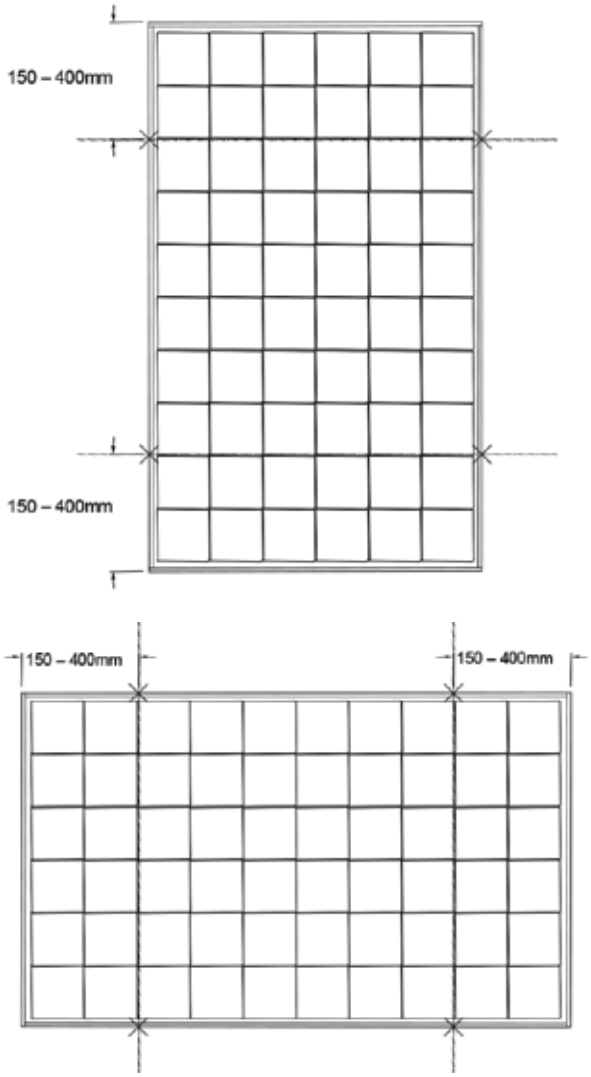

| Module Type | X dim | Y dim |
|---|---|---|
| RSM 6(60) | 986mm | 1630mm |
| RSM 6(54) | 986mm | 1472mm |
| RSM 6(48) | 986mm | 1314mm |

## Mounting to Roof Rails

The modules can be fitted with clamps secured to the long sides either in portrait or landscape orientation, fitted parallel or perpendicular to the roof rails.

For module mounted parallel to the roof rails, the module should be fully supported along the underside of the long sides by the roof rails with a minimum of 10mm overlap.

The clip positions should be mounted between 150mm and 400mm from the corner of the module. These dimensions apply to all module sizes.




The modules must be fitted at the minimum amount of 4 fixing points and clamps must be positioned uniformly.

Romag do not recommend fitting along the short edge only.

Any design of support structure for the modules should utilise an appropriate code of practice in order to calculate wind loadings.

For maximum module performance, where possible the modules should face due south in the northern hemisphere and due north in the southern hemisphere. Failure to install the modules correctly and with the correct mounting systems may invalidate the warranty.

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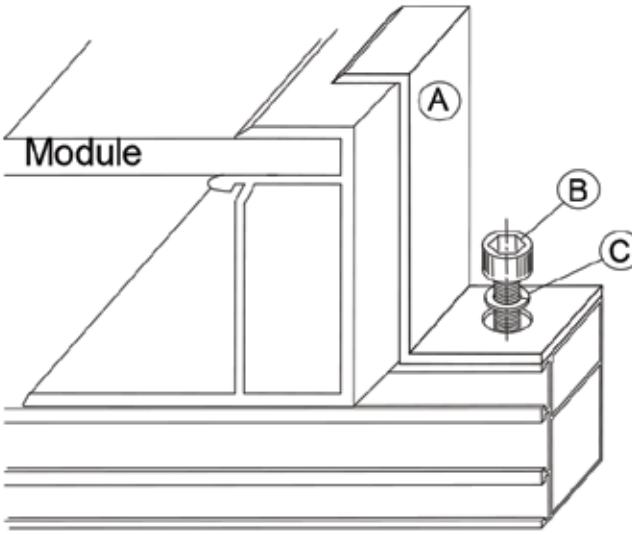
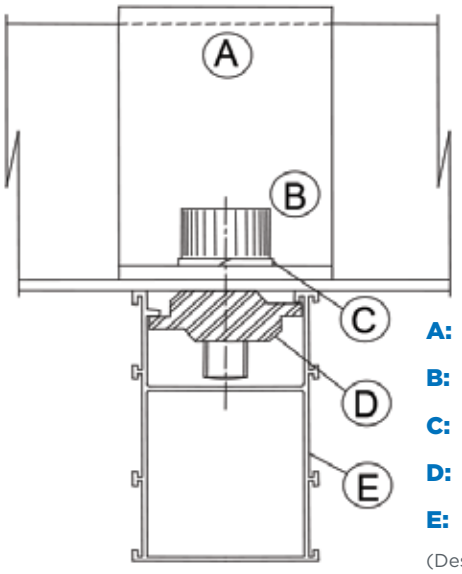
## Mounting with Module Clamps onto Standard Roof Rails



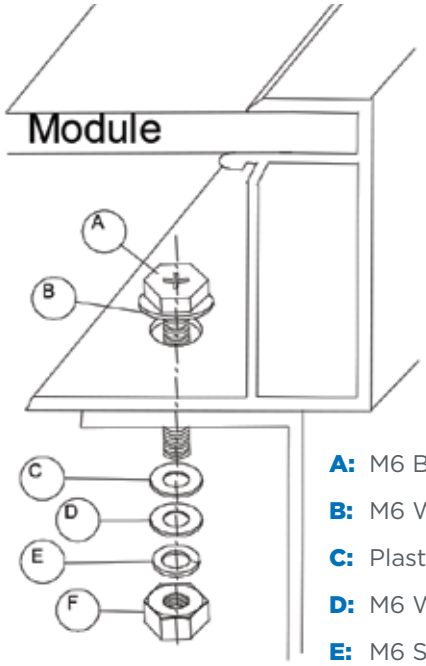

**A:** Standard Clamp
**B:** M6 Allen Bolt
**C:** M6 Spring Washer
**D:** Standard Clip
**E:** Roof Rail

(Designs may vary)

Modules can be fitted using standard roof mounting systems where clamping plates are used to mount the modules onto standard roof rails. Modules supplied in kit form will have all roof mounting systems supplied.

Where several modules are being fitted next to each other, middle module clamps should be used to clamp two modules simultaneously. Refer to the manufacturers roof mounting system installation guidelines for further information.

## Mounting using the Frame Holes




**A:** M6 Bolt
**B:** M6 Washer 16mm Dia
**C:** Plastic / Stainless Spacer
**D:** M6 Washer 12mm Dia
**E:** M6 Spring Washer 12mm Dia
**F:** M6 Nut

Modules can be fitted using holes provided in the module frame. Ensure the modules are fastened down using all holes provided.

## Maintenance & Inspection

Modules should require very little maintenance once installed.

In general, the glass should be kept clean to ensure maximum efficiency of the modules. Cleaning of the glass should be carried out by qualified persons only. The framing system design should be adequately designed to ensure water does not get trapped near electrical connections or within a framing system.

Regular inspection activities should include the following:-

- Cleaning the glass surface
- Removal of snow if possible
- Inspection of fixing systems
- Inspection of cables
- Checking electrical performance

## Disposal

In the event of queries about disposal of PV modules, contact Romag.

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# Notes


APPROVED PRODUCT

MCS ™

KM 558842 BS EN 61215
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**Contact**

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