

PV-ezRack PostMount 3-A with ECO Rail

Code-Compliant Planning and Installation Guide V2.0

Complying with AS/NZS1170.2: 2011 ADMT 4-2016



Introduction

1. Introduction

Clenergy PV-ezRack PostMount 3-A is a ground mounting system suitable for large scale commercial and utility scale installations. PV-ezRack PostMount 3-A has been developed to fit any PV module in the outdoors and uneven ground areas. PV-ezRack PostMount 3-A have good compatibility for the different region via the angle adjustment (10°~60°). Using high quality engineered components PostMount 3-A saves developers and installers, time and money when delivering large scale projects.

Please review this manual thoroughly before installing PostMount 3-A. This manual provides the following contents:

- (1) Installation planning;
- (2) Installation instructions.

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The PV-ezRack PostMount 3-A parts, when installed in accordance with this guide, will be structurally adequate and meet the AS/NZS1170.2:2011 Admt 4-2016 standard. During installation, and especially when working on the ground, please comply with the appropriate occupational health and safety regulations. Please also pay attention to other relevant regulations in your local region. Please check that you are using the latest version of the installation manual by contacting Clenergy via email on www.clenergy.com.cn or contacting your local distributor.

The installer is solely responsible for:

- Complying with all applicable local or national building codes, including any updates that may supersede this manual;
- Ensuring that PV-ezRack and other products are appropriate for the particular installation and the installation environment;
- Using only PV-ezRack parts and installer supplied parts as specified by PV-ezRack project plan (substitution of parts may void the warranty and invalidate the letter of certification);
- Recycling: Recycle: according to the local relative statute;
- Ensuring that there are no less than two professionals working on panel installation;
- Ensuring the installation of related electrical equipment is performed by licenced electricians;
- Ensuring safe installation of all electrical aspects of the PV array including providing adequate earth bonding of the PV array and PV-ezRack® PostMount components as required in AS/NZS 5033-2014 ADMT 2 2-2018.

2. Tools & Components

2.1 Tools

Tools



Allen Key 6 mm



Spanner



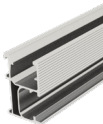
Torque Wrench



5m Tape

2.2 Components

Components



ER-R-ECO/3100
ECO Rail, length 3100mmx2



ER-P-102/2600
Pipex1



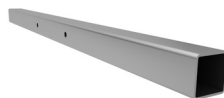
SC-PM2/3/4/A
Steel Capx1



ER-RT-70/394
Adjustable Tubex1



ER-RT-70/2000
Rectangular Tube-
Masterx1



ER-RT-50/1000
Rectangular Tube-
Landscapex2



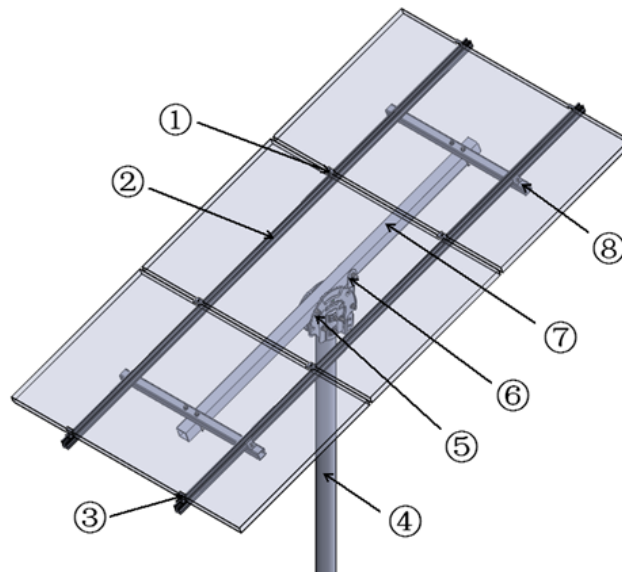
ER-IC-ST
Inter Clamp
Standardx4



ER-EC-ST
End ClampStandardx4

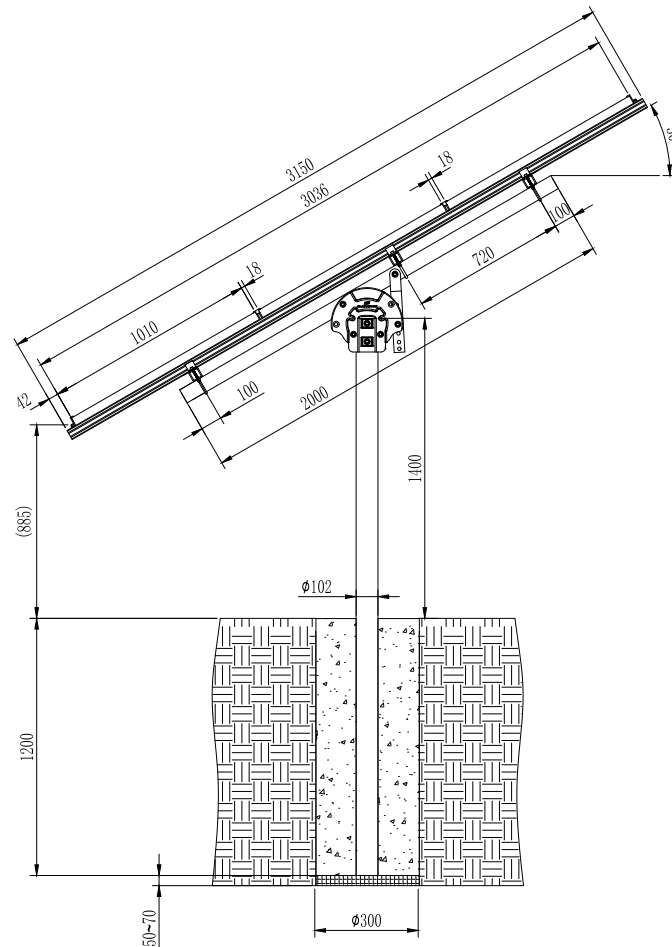
3. System Overview

3.1 Overview of PV-ezRack PostMount 3-A



- ① Inter Clamp
- ② ECO Rail
- ③ End Clamp
- ④ PM3-A Pole
- ⑤ Steel Cap Assembly
- ⑥ Adjustable Tube
- ⑦ Rectangular Tube-Master
- ⑧ Rectangular Tube- Landscape

Side view drawing of PV-ezRack PostMount 3-A is shown below. The panels tilt angle and embedment depth below are for reference only. Please refer to Certificate Letter to obtain the certified max panels tilt angle and min embedment depth for different wind regions and different soil types.



3.2 Precautionary Measures for Stainless-Steel Fastener Installation

Improper operation may lead to the deadlock of bolts and nuts. Follow the steps below to reduce this risk.

3.2.1 Reduce the friction coefficient

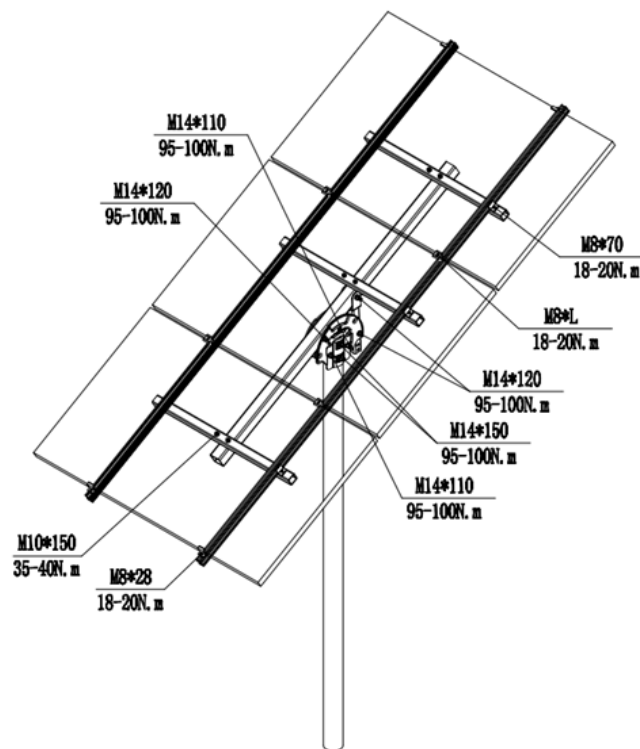
- (1) Ensure that the thread surface is clean (no dirt or contaminant).
- (2) Apply lubricant (grease or 40# engine oil) to fasteners prior to tightening to avoid galling or seizing in the threads.

3.2.2 General installation instructions

- (1) Apply force to fasteners in the direction of thread.
- (2) Apply force uniformly to maintain required torque.
- (3) Professional tools and tool belts are recommended.
- (4) Avoid using electric tools for final tightening.
- (5) Avoid working at high temperatures.

3.2.3 Safe Torques

Please refer to safe torques defined in this guide as shown in the figure below. If power tools are required, Clenergy recommends the use of low speed only. High speed and impact drivers increase the risk of bolt galling (deadlock). If deadlock occurs and you need to cut fasteners, please make sure that there is no load on the fastener before you cut it. Avoid damaging the anodized or galvanized surfaces.



3.3 Installation Dimensions

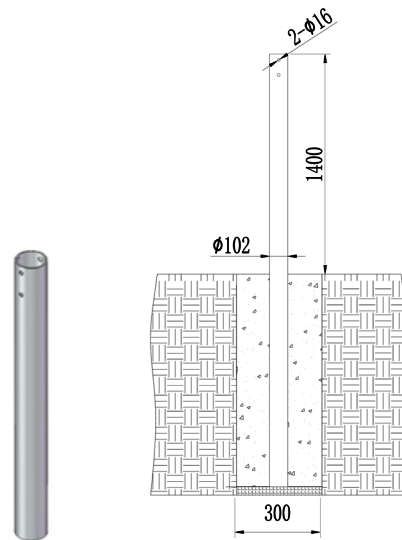
All drawings and dimensions in this installation guide are for generic reference. The PV-ezRack PostMount 3-A is to be optimized to suit specific conditions for each project and documented in engineering drawings. As a result, major components of the PV-ezRack PostMount 3-A may be provided in sectional sizes and lengths that vary from those shown in this guide. The installation operations detailed in this instruction guide remain the same regardless of the component size. In case you need to do any on-site modifications or alteration of the system in a way that would be different from engineering drawings, please provide marked up drawings/sketches for Clenergy's review prior to modification for comment and approval.

4. Installation Instruction

4.1 Pipe Installation

Dig a hole with the diameter of 300 mm.

Place the pole into the middle of the hole and fill it with concrete (min 25 MPa strength). Maintain the position of the post. The allowed vertical tolerance is $\pm 2^\circ$. Keep the axle of the 2- $\varnothing 16$ holes parallel to East-West; keep the vertical angle deviation within $\pm 5^\circ$. For more than one system on one site maintain all the axles of 2- $\varnothing 16$ holes aligned.

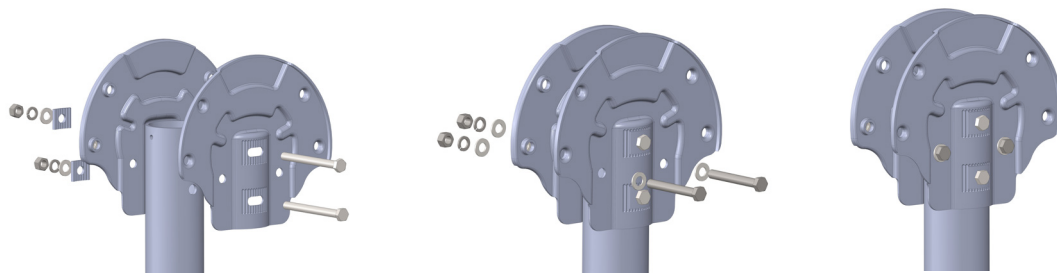


4.2 Steel Cap Installation

Connect the Pipe to the corrugated washer and Steel Cap Assembly with M14*150 hexagonal bolt, plain washer 14, spring washer 14, M14 nut .
Combine two Steel Caps with M14*110 hexagonal bolt, plain washer 14, spring washer 14, M14 hex nut.

Note:

1. Do not fasten the Bolt prior to complete the assembly of PM3-A Rectangular Tube-Master.
2. Keep all the Bolt head aligned.



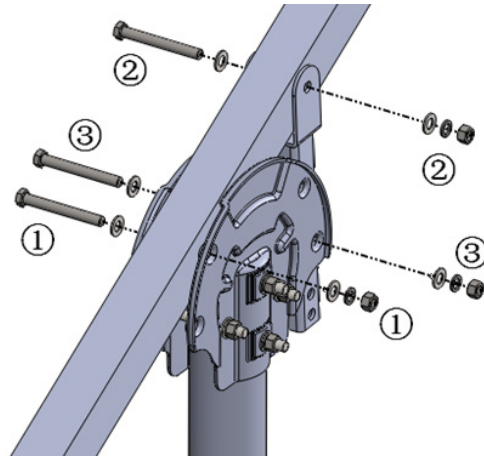
4.3 Rectangular Tube-Master and Adjustable Tube Installation

4.3.1 Fix the Rectangular Tube-Master at Steel Cap Assembly with M14*120 hex bolt, M14 nut, plain washer 14, and spring washer 14. See the mark ① .

4.3.2 Fix the Adjustable Tube at Rectangular Tube-Master with M14*120 hex bolt , plain washer 14, and spring washer 14, M14 nut. See the mark ② .

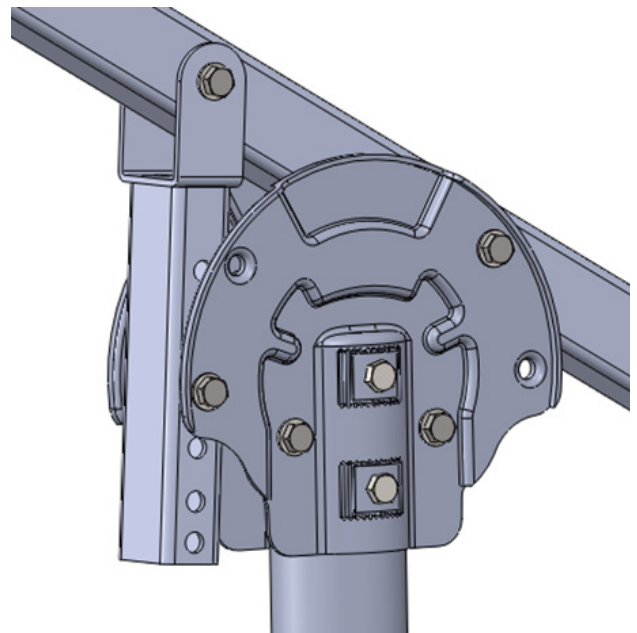
4.3.3 Fix the Adjustable Tube at Steel Cap Assembly with M14*120 hex bolt, M14 nut, plain washer 14, and spring washer 14. See the mark ③ .

Realized the angle adjustment by position the bolt in the different holes.



4.3.4 Fasten the Steel Cap Assembly to Pipe with M14*150, M14*110 Hex Bolt, keep the Rectangular Tube-Master parallel to the south-north by adjust the Steel Cap Assembly.

Recommended torque for M14 bolts is 95~100 N·m.



Note:

1: Adjust the angle of the allation, the angle of the Rectangular Tube-Master with 10° (6 holes from up to bottom corresponds to 10° to 60° tilt angle) in order to make the assembly process run smooth.

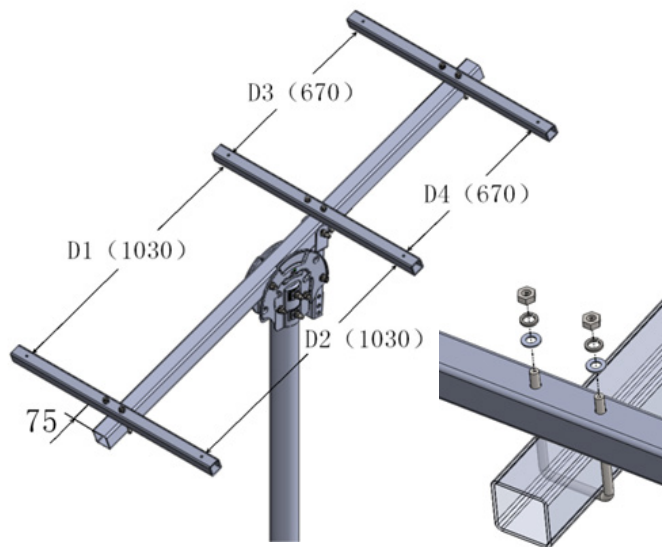
2: Using the adjustable washer to avoid the gap between the Rectangular Tube-Master and the Adjustable Tube. Unreliable connection is forbidden.

4.4 Rectangular Tube- Landscape Installation

4.4.1 Fix the 3 pcs PM3-A Rectangular Tube- Landscapes at Rectangular Tube-Master with 3 pcs U-bolts, 6 pcs M10 nuts , 6 pcs spring washers 10, and 6 pcs plain washers 10. Do not fasten the Nut until 3 Rectangular Tube- Landscapes aligned.

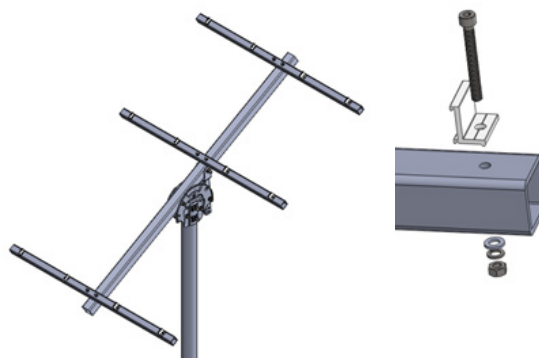
Note: Adjust the Rectangular Tube- Landscapes until the dimension D1=D2, D3=D4.

Recommended torque for M10 bolts is 35~40 N·m.



4.4.2 Preassemble the Cross Connection Clamp at the Rectangular Tube-Master with M8*70 hex bolts, plain washer 8, spring washer 8, and M8 nut as shown in the figure below.

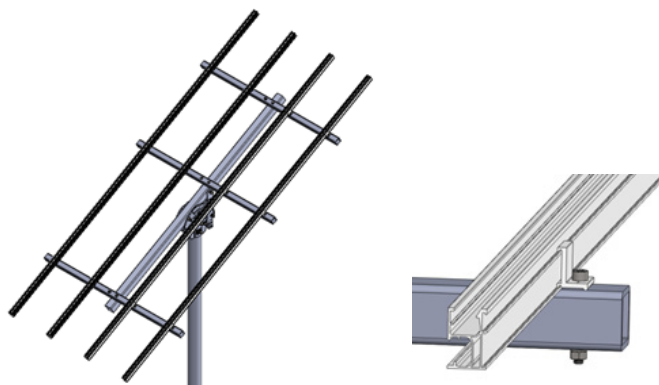
Note: Do not fasten the M8*70 hex bolt in order to make other clamp fit well.



4.5 ECO Rail Installation

Uplift the Cross Connection Clamp in the certain angle. Click the Clamp into the ECO Rail. Position the Rail in the middle of the Rectangular Tube-Master, and then fasten the M8*70 bolt.

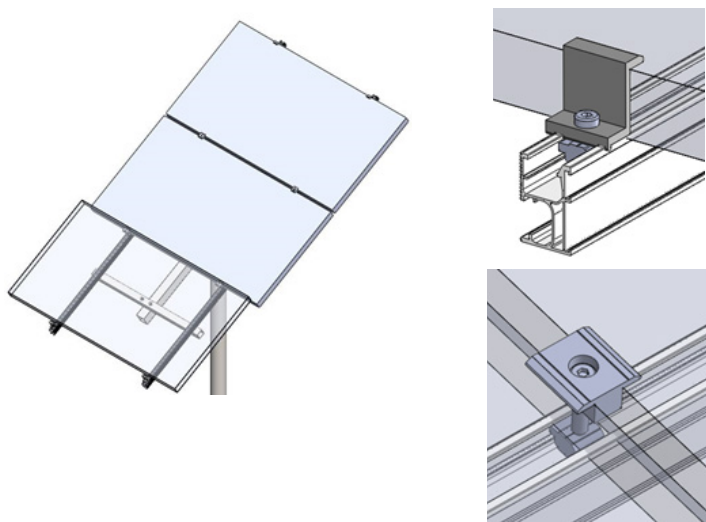
Recommended torque for M8 bolts is 18~20 N·m.



4.6 PV Module Installation

Fix the PV panel to Rail, via Inter Clamps and End Clamps step by step until all the panels complete.

Recommended torque for M8 bolts is 18~20 N·m.



Certification Letter

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Our Ref: 8762-PM3A/AA
 31 August 2020

CLENERGY AUSTRALIA
 1/10 Duerdin St
 Clayton VIC 3168

Array Frame Engineering Certificate

RE: Postmount PM3-A Installation – PV panel 1750mmx1010mm

Gamcorp (Melbourne) Pty Ltd, being Structural Engineers within the meaning of Australian Regulations, have carried out a structural design check of the PV-ezRack Postmount PM3-A for installation in four general soil types within Australia and New Zealand. The design check has been based on the drawings of the system and its components, and other documents and information, provided by CLENERGY AUSTRALIA.

Part No.	Part Name	Description
13-11011-004	ER-EC-ST	PV-ezRack Standard End clamps
13-11010-004	ER-IC-ST	PV-ezRack Standard Inter clamps
13-10038-023	ER-R-ECO	PV-ezRack ECO Rail 3150mm
13-15011-002	ER-RT-50/1000	PV-ezRack PM3-A, Rectangular Tube-Landscape 50*50*1000mm
13-15011-042	ER-RT-70/2000	PV-ezRack PM3-A, Rectangular Tube-Master 70*70*2000mm
13-16011-025	ER-RT-70/394	PV-ezRack Postmount 3-A&4-A, Adjustable Tube 70*50*394mm
13-16011-017	ER-SC-PM2-A/PM3-A/PM4-A	PV-ezRack PM-2 A, PM3-A, PM4-A, Steel Cap Assembly
13-16011-054	ER-AP-PM3-A	PV-ezRack PM3-A, Accessory Package
13-15010-043	ER-P-102/2600	PV-ezRack, Pipe \varnothing 102*2600mm(PM3-A,4-A Pole)

We find the Postmount PM3-A to be structurally sufficient for the proposed installation, based on the following conditions:

- Wind Loads according to AS/NZ1170.2:2011 (R2016):
 - Wind Terrain Category 2;
 - Wind average recurrence interval of 100 years for ultimate state and 25 years for serviceability;
 - Wind region A, B, C & D;
 - $M_d=1$, $M_s=1$ & $M_t=1$;
- Max. Solar Panel length 1750mmx1010mm;
- Steel members to be **Q235B**;

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- Aluminium members to be **AL6005-T5**;
- Bolts to be **SUS304**;
- The certification **excludes** assessment of PV panels
- Refer to **Table 1** for maximum tilt angle and footing options;
- Dimensions as shown here on the picture;

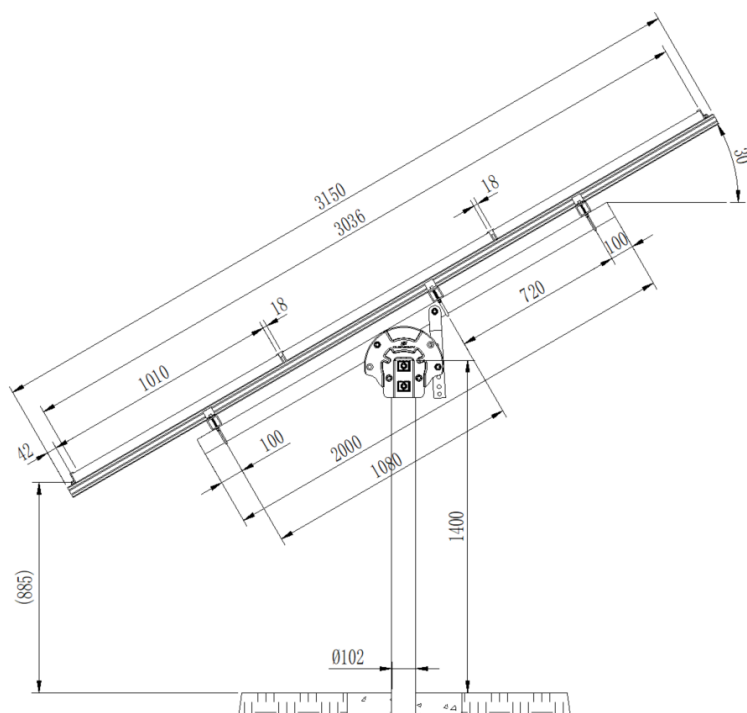


Table 1 – Maximum Tilt Angle and Footing Options

	Wind Region			
	Region A	Region B	Region C	Region D
Wind speed (m/s)	41	48	59	73
Maximum tilt angle (°)	60	20	10	10
Soil Type	Post embedded in concrete pier: 300 mm diameter concrete piers minimum depth (m)			
<u>Hard class soil</u> [Gravels; dry (hard) clays]	1.20	0.90	0.70	0.80
<u>Very Firm class soil</u> [Dry (stiff) clays; clayey sands; coarse sands; compact sands]	1.30	1.00	0.75	1.05
<u>Firm class soil</u> [Damp clays; sandy clays; damp sands]	1.45	1.10	0.95	1.35
<u>Soft class soil</u> [Wet clays; silty loams; wet or loose sands]	1.70	1.35	1.25	1.85

Notes:

- 1. This certification is applicable for the Postmount PM3-A with dimensions as shown in this letter.**
- 2. Other piers dimensions are possible, contact Gamcorp, if required.**
- 3. Panel weight calculated: 20kg.**
- 4. Embedment depth is relevant for soils, having adhesion capacity from 300mm of the ground level; in other cases contact Gamcorp.**
- 5. For concrete piers foundation, use 25 MPa strength concrete (minimum). It is recommended to insert N12 bar 200mm long at the bottom of the post into the concrete piers.**
- 6. If any of the above conditions cannot be met, the structural engineer must be notified immediately.**

Construction is to be carried out strictly in accordance with the manufacturers instructions and site soil report recommendations. This work was designed by **Ali Askari** in accordance with the provisions of relevant Regulations and in accordance with sound, widely accepted engineering principles.

Yours faithfully,
Gamcorp (Melbourne) Pty Ltd



L. van Spaandonk
Principal Engineer
FIEAust Cpeng NER



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Worldwide Network

