



GRACE SOLAR

The Leader of PV Mounting System



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Xiamen Grace Solar Technology Co., Ltd.

COMPANY PROFILE

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Xiamen Grace Solar Technology Co., Ltd. is a high-tech enterprise in the field of solar PV with leading technology and excellent services. Specializing in solar PV products, Grace Solar members devote to research and develop, manufacture and market the steadiest, most trustable and cost-efficient solar mounting system solutions. As one of the largest PV solar products exporter in China, the pioneer Grace Solar products have been installed in more than 100 countries and regions since the foundation.

Research and Development

Grace Solar insist Profession and Innovation on products research and development, offering good guarantee to customers with Profession, and cultivating better value with Innovation.

Grace Solar set up the international and professional Research and Development team with the oversea educated leader, emphasizing elite personnel and advanced equipment application, which keep our design and performance taking road of PV solar. Grace Solar acquire Intellectual Property and software Copyrights protect for high-tech products including Ground Mounting System, Roof Mounting System, and the Micro-Inverter. [删除逆变器的内容](#)

Management Concepts

Grace Solar bring forward the standardized and internationalized management concept at the beginning of establishment, positively implementing ISO quality system in all phases of management and apply APQP, FMEA, CP Control Plan, MSA, SPC five tools in the stages of R&D, manufacturing, marketing and service.

Furthermore, Grace Solar take importance to international authority certification for the products, actively studying with international and domestic certification institutions such as UL, TUV, CE, CQC, SAA, AS/NZS 1170 and Golden Sun.

Service Networks

Due to long term fast feedbacks for reliable qualified products and services, Grace Solar win trust from worldwide System Integration Company, installers and distributors. Cooperating with several strong facilitators in different areas, Grace Solar create global service networks to offer quick and efficient services.

PRODUCT LINE



Pitched Roof Racking System
斜屋顶支架



Tilt Racking System
倾斜支架



Ballasted Mounting System
压载屋顶支架



UB-Ground Mounting System
UB 地面支架系统



Pile-Ground Mounting System
打桩式地面支架



Al-Ground Mounting System
全铝合金地面支架



Pole Mounting System
立柱支架系统



Ground Screws
钻地螺栓



GRASOL PITCHED ROOF RACKING SYSTEM

斜屋顶支架系统

SLOPE ROOF

Grasol Pitched Roof designs with great flexibility both for commercial and residential roof solar system, suitable for installing framed and frameless modules flushed to the pitched roof. Special extruded Aluminum rail, pre-assembled clamps and varied roof hooks or brackets with tilt-in module ensure easy and quick installation, saving your labor time and cost. Besides, the customized length of rail will not require onsite weld and cut, keeping the appearance entirety, structural strength and anticorrosive performance.



TECHNICAL INFORMATION

技术参数

- Install site:** Pitched Roof
- Tilt Angle:** Flushed with the roof up to 60deg
- Building Height:** up to 20m
- Max Wind Speed:** up to 60m/s
- Snow Load:** up to 1.4KN/m²
- Standard:** AS/NZS 1170 and other international Standard
- Material:** High Class Aluminum alloy
Stainless steel
- Color:** Natural
- Anticorrosive:** Anodized
- Warranty:** Ten years warranty
- Duration:** More than 20 years

BENEFITS

产品优点

- Easy Installation:** the tilt-in module can be put into the extruded rail from any section and can be pre-assembled with the clamp and roof hook, minimizing time and cost of installation.
- Flexibility and Adjustable:** these systems accommodate most commercially available framed or frameless solar panels and diverse roof types.
- Safety and Reliability:** The racking systems can stand up to the extreme weather complied with the AS/NZS 1170 and other international structure load standards by skilled engineers. The main support components have also

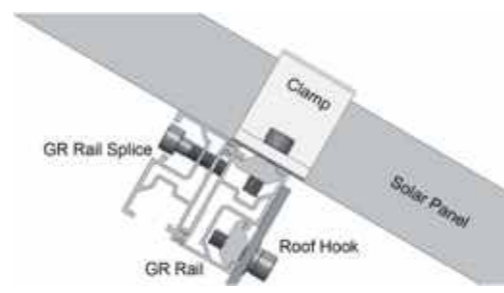
ASSEMBLY FIGURE

安装示意图



Four Steps to put the tilt-in module into rail easily

简易安装4步骤



Assembly drawing

组装示意图

COMPONENTS

零件

Grasol Rail 导轨

Features

- Material: Al6005-T5
- Patent Extruded Aluminum Section
- High Class Anodized Aluminum
- Color: Natural

特性:

- ? 材料: Al6005-T5
- ? 铝合金挤压型材
- ? 表面高标准阳极氧化处理
- ? 颜色: 自然色

Package: 8 Pcs/ package

Item No.	Description
Standard	
GR-R-2560	GR Rail with a standard length of 2560 mm Designed to mount 3 modules (width 808~826mm)
GR-R-3405	GR Rail with a standard length of 3405 mm Designed to mount 4 modules (width 808~826mm)
GR-R-4200	GR Rail with a standard length of 4200 mm Designed to mount 4 modules (width 990~996mm)
Customized Length	
GR-R	GR Rail with a customized length



GR-R



GR Rail



GR Rail Connect

Rail Splice Kit 导轨连接件

Features

- Material: Al6005-T5 & A2-70 bolt
- Connect two pieces GR rail
- Color: Natural

特性

- ? 材料: Al6005-T5 & A2-70 螺栓
- ? 连接两根GR标准导轨
- ? 颜色: 自然色或黑色

Package: 15Pcs/Box 4Boxes/CTN

Item No.	Description
GR-R-SP	GR standard rail splice kit



GR-R-SP





COMPONENTS

Framed Module Clamps 有框组件压块

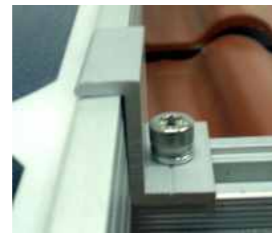
Features

- Material: Al6005-T5 & A2-70 stainless steel bolt
- Pre-assembly to compatible with the most Framed Module
- Include the Inter Clamp and End Clamp
- Color: Natural

Package: 100Pcs/Box 4Boxes/CTN

特性:

- ? 材料: Al6005-T5 & A2-70螺栓
- ? 跟斜装卡件高度预装, 适用于各种常见的太阳能板
- ? 包含中压块和侧压块
- ? 颜色: 自然色或黑色



Inter Clamp Kit

Item No.	Description
GR-IC-F30	Grasol Inter Clamp Kit 30mm
GR-IC-F35	Grasol Inter Clamp Kit 35mm
GR-IC-F40	Grasol Inter Clamp Kit 40mm
GR-IC-F46	Grasol Inter Clamp Kit 46mm
GR-IC-F50	Grasol Inter Clamp Kit 50mm
GR-IC-F57	Grasol Inter Clamp Kit 57mm



GR-IC-F

End Clamp Kit

GR-EC-F30	Grasol End Clamp Kit 30mm
GR-EC-F35	Grasol End Clamp Kit 35mm
GR-EC-F40	Grasol End Clamp Kit 40mm
GR-EC-F46	Grasol End Clamp Kit 46mm
GR-EC-F50	Grasol End Clamp Kit 50mm
GR-EC-F57	Grasol End Clamp Kit 57mm



GR-EC-F



GR-EC-F

GR-EC-A40	Grasol Adjustable End Clamp Kit -For the module thickness from 25-60mm
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COMPONENTS

Frameless Module Clamps 无框组件压块

Features

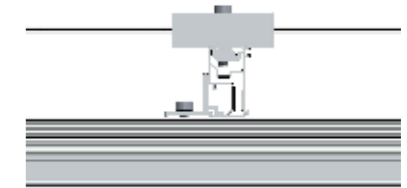
- Material: Anodized Al6005-T5
- Suitable for the thin film module with thickness 6~10mm
- Pre-assembly with Rubber Pad and Stainless Steel Fastener
- Color: Natural

? 材料: Al6005-T5 & A2-70螺栓

? 适用于薄膜太阳能板6-10mm厚度

? 跟斜装卡件, 橡胶垫和不锈钢紧固件高预装

? 颜色: 自然色或黑色



Item No.	Description
GR-IC-L80	Thin Film Module Inter Clamp



GR-IC-L80

GR-EC-L80	Thin Film Module Inter Clamp
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GR-EC-L80

GR-CC-40	Rails Cross-Connector
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GR-CC-40

Features

- Material: Anodized Al6005-T5
- Pre-assembly with Stainless Steel Fastener
- Color: Natural

COMPONENTS

太阳能斜屋顶挂钩

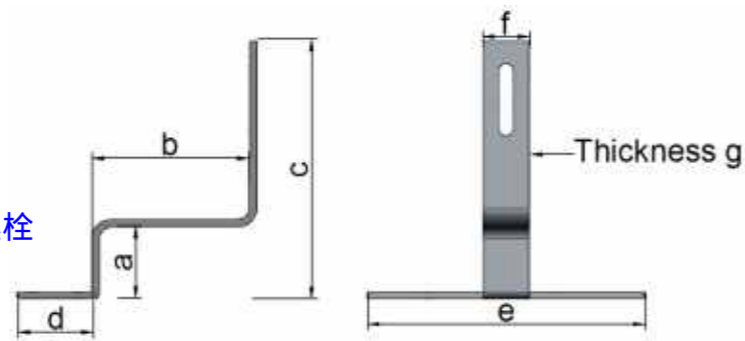
Tile Roof Hook 陶瓷瓦屋顶挂钩

Features

- Material: Stainless steel 304 & A2-70 bolt
- Pre-assembly with the tilt-in module
- Various types to meet the difference roof
- Chosed according to the weather condition

特性:

- ? 材料: A16005-T5 & 不锈钢304 & A2-70螺栓
- ? 跟斜装卡件预装
- ? 款式多样适合不同的屋顶和气候条件



Dimension Drawing For the Charts

Item No.	Description						
GR-IK-01	Stainless Steel Hook 1# -Fix rails to Roman tile roof -For low Snow loads and normal wind load						
Dimension Chart							
	a	b	c	d	e	f	g
mm	46	101	166	50	180	30	5

Package: 40PCS/CTN



GR-IK-01

GR-IK-02	Stainless Steel Hook 2# -Fix rails to Flat tile roof -For low Snow loads and normal wind load						
	a	b	c	d	e	f	g
mm	30	190	166	80	30	30	5

Package: 60PCS/CTN



GR-IK-02

GR-IK-03	Stainless Steel Hook 3# -Fix rails to Roman tile roof -For low Snow loads and normal wind load						
	a	b	c	d	e	f	g
mm	30	101	166	50	30	30	5

Package: 24PCS/CTN



GR-IK-03

COMPONENTS

Item No.	Description			
GR-IK-04	Stainless Steel Hook 4# -Fix rails to Slate tile roof -For low Snow loads and normal wind load			
	Length	Height	Width	Thickness
mm	200	120	30	5

Package: 80PCS/CTN



GR-IK-04

GR-IK-06	Stainless Steel Hook 6# -Fix rails to Roman tile roof -For low Snow loads and normal wind load						
	a	b	c	d	e	f	g
mm	46	70	166	50	180	30	5

Package: 40PCS/CTN



GR-IK-06

GR-IK-09	Stainless Steel Hook 9# -Fix rails to Roman tile roof -For the heavy snow load						
	a	b	c	d	e	f	g
mm	46	111	200	60	180	35	8

Package: 20PCS/CTN



GR-IK-09

GR-IK-12	Adjustable Stainless Steel Hook 12# -Top fix rails to Roman tile roof -For the low snow load and normal wind load						
	a	b	c	d	e	f	g
mm	38~50	101	158~170	55	140	30	5

Package: 40PCS/CTN



GR-IK-12

COMPONENTS

Tile Roof Hook 陶瓷瓦屋顶挂钩

Item No.	Description						
GR-IK-02-A	Stainless Steel Hook 2# A type -Side fix rails to Flat tile roof -For low Snow loads and normal wind load						
Dimension Chart							
	a	b	c	d	e	f	g
mm	30	190	166	80	30	30	5

Package: 60PCS/CTN



GR-IK-02-A

Item No.	Description			
GR-IK-04-A	Stainless Steel Hook 4# A type -Side fix rails to Slate tile roof -For low Snow loads and normal wind load			
	Length	Height	Width	Thickness
mm	200	120	30	5

Package: 80PCS/CTN



GR-IK-04-A

Item No.	Description			
GR-IK-AP01	Stainless Steel Hook Side Adjust Plate 1# -Cooperated with hook to side fix with rafter -For low Snow loads and normal wind load			
	Length	Height	Width	Thickness
mm	90	90	50	4

Package: 80PCS/CTN



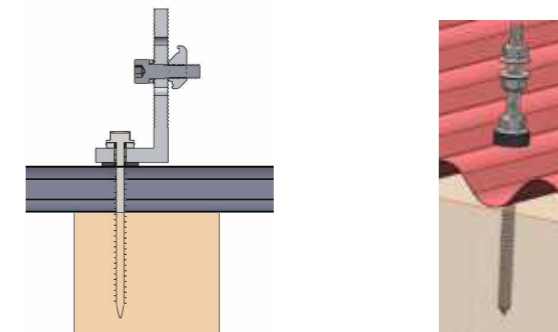
GR-IK-AP01

COMPONENTS

Corrugated Roof Hook 铁皮屋顶挂钩

Features

- Material: Al6005-T5 & A2-70 bolt
- Extruded Aluminum Section
- Pre-assembly with the tilt-in module
- Wood screw types: M6, M10, M12



Item No.	Description
GR-IK-05	Aluminum Tin Interface Kit 5# -Fix rails to tin roof -Fixation by a wood screw M6x80

Package: 200PCS/CTN



GR-IK-05

GR-IK-H01	Hanger Bolt Hook 1# -Suitable for GR Rail -M10x200 hanger bolt kit with angle plate kit
GR-IK-H02	Hanger Bolt Hook 2# -Suitable for GR Rail -M12x200 hanger bolt kit with angle plate kit
GR-IK-H03	Hanger Bolt Hook 3# -Suitable for GR Rail -M12x300 hanger bolt kit with angle plate kit



GR-IK-H01
GR-IK-H02
GR-IK-H03

GR-IK-H04	Hanger Bolt Hook 4# -Suitable for GR Rail -M10x200 hanger bolt kit with L feet kit
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GR-IK-H04



COMPONENTS

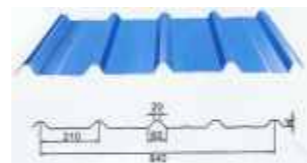
Sheet Metal Roof Hook 铁皮屋顶挂钩

Features

- Material: Al6005-T5 & stainless steel 304 & A2-70 bolt
- Pre-assembly with the tilt-in module
- Customized according to the section parameter of the sheet metal roof.

Package: 160PCS/CTN

Item No.	Description
GR-IK-07	Stainless Steel Hook 7#
GR-IK-07-A	Stainless Steel Hook 7# A type
GR-IK-07-B	Stainless Steel Hook 7# B type



Trapezoid Roof Size

Note: Standard product is just fitted with the trapezoid roof as right figure shown other size must consider the mould cost



GR-IK-07



GR-IK-07-A



GR-IK-07-B



Parallel



Vertical



Both

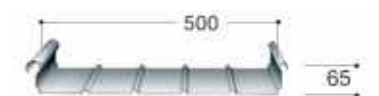
COMPONENTS

Standing Seam Roof Hook 直立锁边挂钩

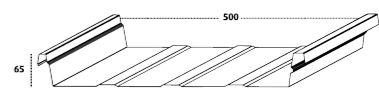
Item No.	Description
GR-IK-S01	Standing Seam Roof Hook 1# -Suitable for Butler roof
GR-IK-S02	Standing Seam Roof Hook 2# -Suitable for KalZip- Bemo-roofs
GR-IK-S03	Standing Seam Roof Hook 3# -Suitable for Zambelli RibRoof Speed 500
GR-IK-S04	Standing Seam Roof Hook 4# -Suitable for Butler roof
GR-IK-SK7	Standing Seam Roof Hook K7 -Suitable for Klip-Lok 700
GR-IK-S02-A	Standing Seam Roof Hook 2# A type, -Suitable for KalZip- Bemo-roofs -Length 80mm
GR-IK-S03-A	Standing Seam Roof Hook 3# A type, -Suitable for Zambelli RibRoof Speed 500 -Length 80 mm
GR-IK-SK7-A	Standing Seam Roof Hook K7 A type -Suitable for Klip-Lok 700 -Length 80mm



Butler-roof



KalZip-roof



Zambelli Rib Roof Speed 500



Klip-lok 700



GR-IK-S01



GR-IK-S02



GR-IK-S03



GR-IK-SK7



GR-IK-S04



GR-IK-S02-A



GR-IK-S03-A



GR-IK-SK7-A



COMPONENTS

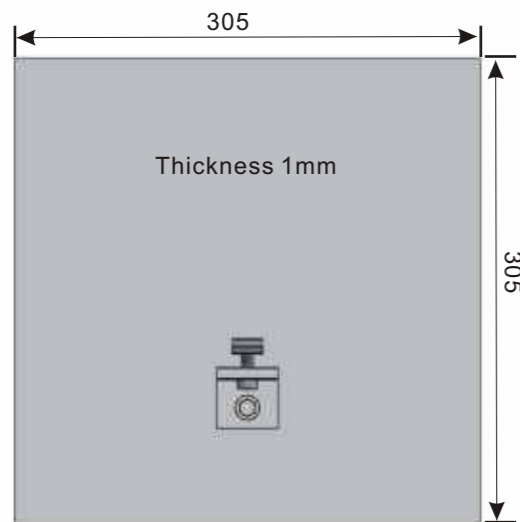
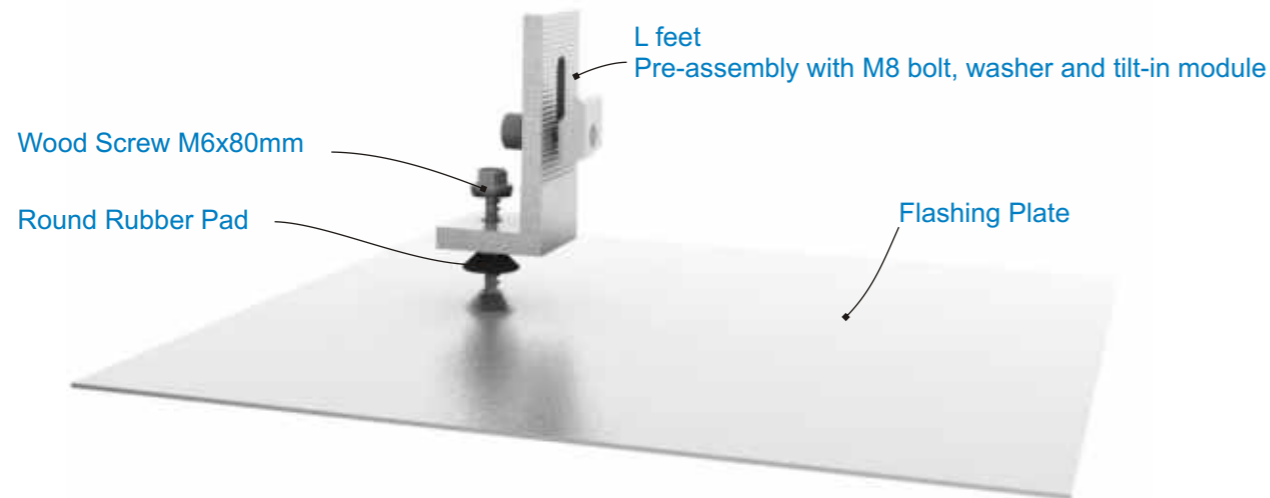
Flashing Hook 防水挂钩

Item No.	Description
GR-FK-01	Shingle Roof Flashing Hook, 305x305x1mm
GR-FK-02	Shingle Roof Flashing Hook, 305x205x1mm

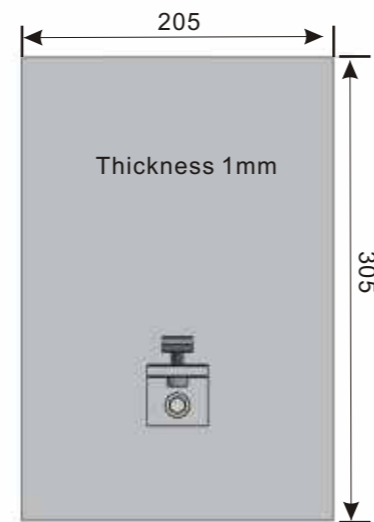
- 特性：
- ？一体化遮雨板和支架固定光伏支架系统
 - ？材质为铝合金及不锈钢
 - ？无痕迹安装，节省时间，不需切割屋顶的任何部分
 - ？适合大部分屋顶结构和木瓦结构屋顶

Features

- All-in-one waterproof flashing and mount to anchor photovoltaic racking systems
- Made of all aluminum and includes stainless steel hardware
- Installs seamlessly and saves labor by not needing to cut away any roofing
- Fit with in most composition and wood shingle roof systems



GR-FK-01



GR-FK-02



COMPONENTS

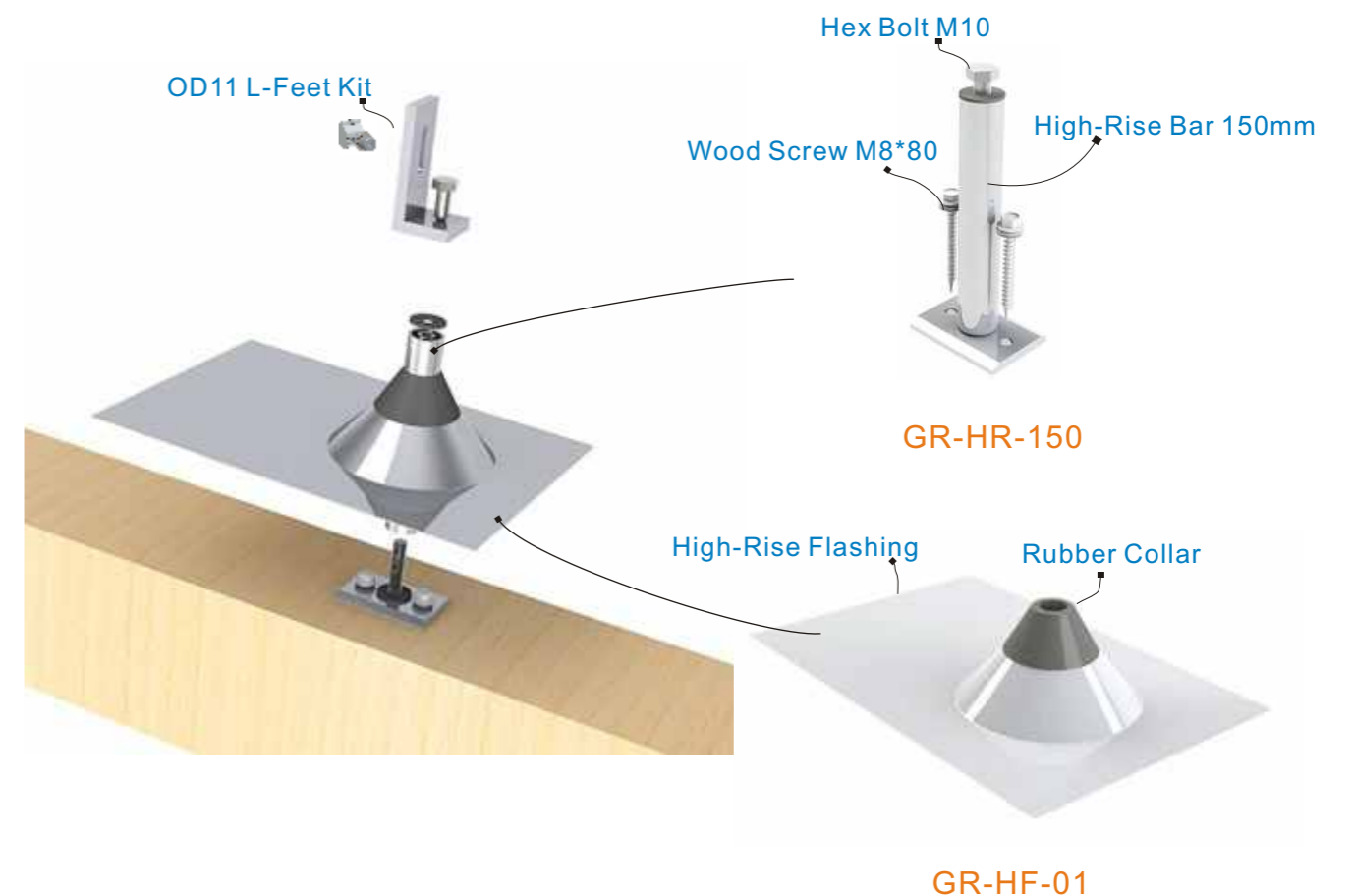
High-Rise Flashing 增高遮雨板

Item No.	Description
GR-HR-150	High-Rise Bar, Height is150mm -Height can be customized
GR-HF-01	High-Rise Flashing1#, 305x205x1mm
GR-IK-L11	OD11 L Feet Kit

- 特性：
- ？材质为铝合金及不锈钢
 - ？防老化密封环
 - ？不适合热铺式或组合式屋顶
 - ？不要用油漆或石油涂在橡胶环

Features

- Made of all aluminum and includes stainless steel hardware
- Non-fading sealing collar
- Not for hot-mopped or built-up roofs
- Do not use paint or petroleum based products on rubber collars



GR-HR-150

GR-HF-01





COMPONENTS

Accessories 有框组件压块

GR-A-IC	Framed Module Inter Clamp
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有框组件中压块

GR-A-EC30	Framed Module End Clamp 30
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GR-A-EC35	Framed Module End Clamp 35
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GR-A-EC40	Framed Module End Clamp 40
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GR-A-EC46	Framed Module End Clamp 46
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GR-A-EC50	Framed Module End Clamp 50
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GR-A-EC57	Framed Module End Clamp 57
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侧压块

GR-A-TM01	Tilt-in Module, -Width 20mm, M8 threaded hole
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斜装卡块

GR-A-PC01	Plastic Cable Clip 1#
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塑料电缆夹



COMPONENTS

Fastener 紧固件

Socket Head Screw-----Stainless Steel A2-70

GR-F-S820	Socket Head Screw M8x20
GR-F-S825	Socket Head Screw M8x25
GR-F-S828	Socket Head Screw M8x28
GR-F-S830	Socket Head Screw M8x30
GR-F-S835	Socket Head Screw M8x35
GR-F-S840	Socket Head Screw M8x40
GR-F-S845	Socket Head Screw M8x45
GR-F-S850	Socket Head Screw M8x50
GR-F-S855	Socket Head Screw M8x55
GR-F-S860	Socket Head Screw M8x60
GR-F-S865	Socket Head Screw M8x65
GR-F-S870	Socket Head Screw M8x70



内六角螺栓

Nut-----Stainless Steel A2-70

GR-F-N108	Hexagon Nut, M8
GR-F-N208	Flange Nut With Locking Teeth, M8
GR-F-N210	Flange Nut With Locking Teeth, M10
GR-F-N212	Flange Nut With Locking Teeth, M12



六角螺母

法兰带齿螺母

Washer-----Stainless Steel A2-70

GR-F-W108	Spring Washer, M8
GR-F-W208	Lock Washer, M8, OD13
GR-F-W308	Lock Washer, M8, OD18



Self-tapping Screw-----Stainless Steel 410

GR-F-T625	Self-tapping Screw, S16.3x25
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自攻螺栓

COMPONENTS

Screws and Accessories

Wood Screw

GR-F-W680	Galvanized Wood Screw, St6.3x80 With Pad
GR-F-W808	Galvanized Wood Screw, M8x80 With Pad
GR-F-W010	Galvanized Wood Screw, M10x100 With Pad



热镀锌木螺钉

Hanger Bolt

GR-F-H020	Hanger Bolt M10x200 -Stainless Steel A2-70
GR-F-H220	Hanger Bolt M12x200 -Stainless Steel A2-70
GR-F-H230	Hanger Bolt M12x300 -Stainless Steel A2-70



陶瓷屋顶 3 块板

双头木螺钉

Hanger Bolt Assembly

Features

- Material: A2-70 bolt
- Incule 3 pcs Flange Nuts & Rubber Pad & Hanger Bolt
- Pre-assembly

GR-FA-H020	Hanger Bolt Assembly M10x200
GR-FA-H220	Hanger Bolt Assembly M12x200
GR-FA-H230	Hanger Bolt Assembly M12x300

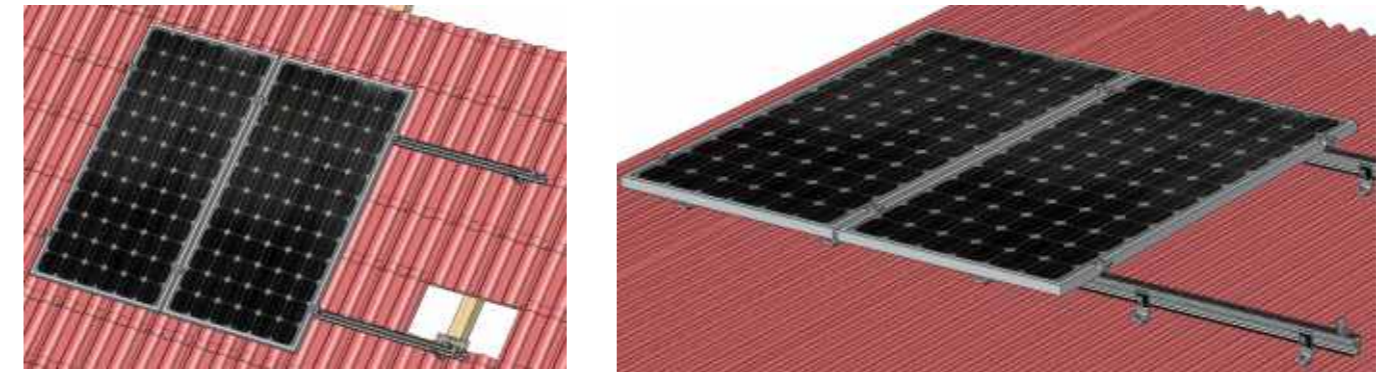


双头木螺钉预安装

陶瓷屋顶 8 片板

PROJECT EXAMPLE

Framed Module Project 有框太阳能组件工程案例



Solar Panels Size: 1580*808*46mm or 1585*826*46mm	Rail GR-R-	Roof Hook GR-IK-01 (Tile) GR-IK-05 (Tin)	Inter Clamp GR-IC-F46	End Clamp GR-EC-F46	Rail Splice GR-R-SP
Tile Roof 3 Panels	2560mm 2 pcs	6	4	4	2
Tile Roof 4 Panels	3405mm 2pcs	6	6	4	2
Tin Roof 3 Panels	2560mm 2 pcs	10	4	4	2
Tin Roof 4 Panels	3405mm 2 pcs	10	6	4	2

Note: The above planning is applicable to the low snow loads and normal wind loads.

Frameless Module Project 无框太阳能组件工程案例



Solar Panels Size: 1200*600*6.8mm	GS Rail Top Floor	GS Rail Bottom Floor	Thin Film Inter Clamp	Thin Film End Clamp	Rails Cross-Connector	Roof Hook 1#
	GR-R-2560	GR-R-2560	GR-IC-L80	GR-EC-L80	GR-CC-40	GR-IK-01
Tile Roof 8 Panels Array 4x2	2560mm 4 pcs	2560mm 2 pcs	80mm 12 pcs	80mm 8 pcs	40mm 8 pcs	Thickness 5mm 6 pcs

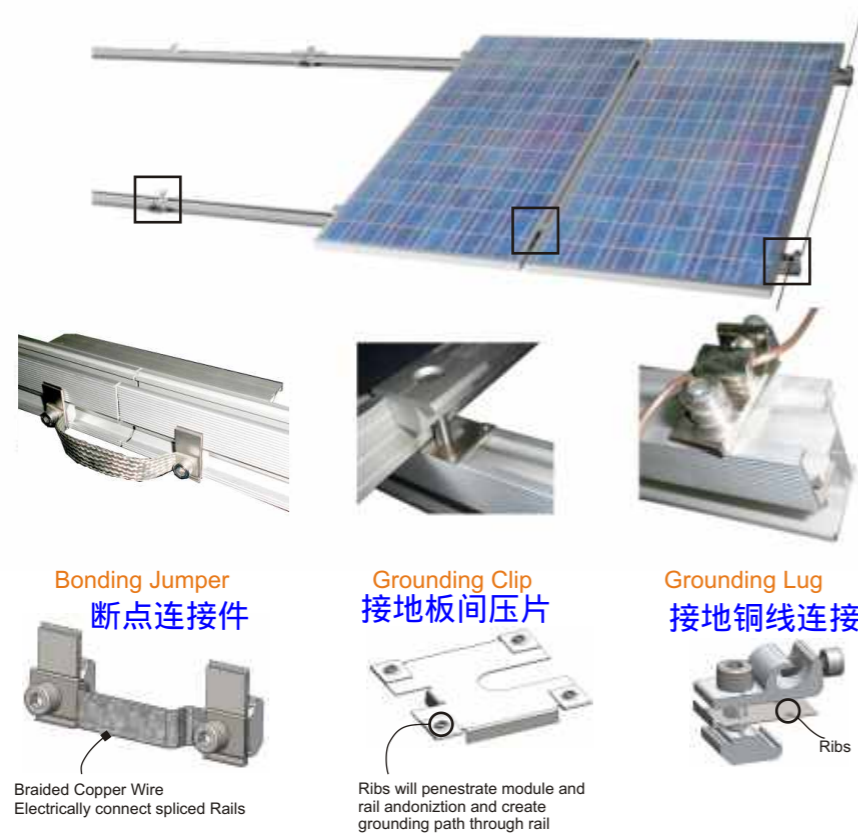
Note: The above planning is applicable to the low snow loads and normal wind loads.

GRASOL GROUNDING SYSTEM

接地系统

GROUNDING

Grasol Grounding Product can be used to bond solar modules to the aluminum rails and the aluminum rails to ground, so that the entire solar system is grounded and safe; Grounding products include the stainless steel grounding clip and aluminum grounding lug, which are all designed to comply with the requirement of AS5033, UL467 for bonding or grounding systems.



Bonding Jumper
断点连接件

Braided Copper Wire
Electrically connect spliced Rails

Grounding Clip
接地板间压片

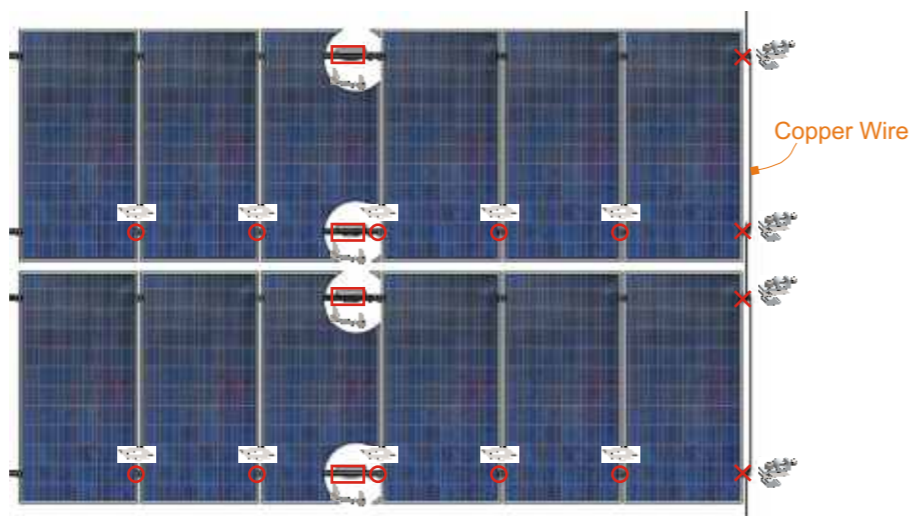
Ribs will penetrate module and rail andonization and create grounding path through rail

Grounding Lug
接地铜线连接件

Ribs

PLANNING LAYOUT

- Grounding Clip
接地板间压片
- × Grounding Lug
接地铜线连接件
- Bonding Jumper
断点连接件



COMPONENTS

Grounding Clip 板间压片

特点
材料: SUS304
正反两面特别的肋点能刺入铝合金的阳极氧化层和压块配合安装到导轨上

Features

- Material: SUS304
- Special rib both surface to pierce the aluminum anodization
- Cooperated with Inter Clamp to install on the GS Rail

Item No.	Description
GR-G-GC	Grounding Clip



接地板间压片

Grounding Lug 接地铜线连接件

Features

- Connect system to equipment ground conductor
- High Pre-assembly

Item No.	Description
GR-G-GL	Grounding Lug

- Material: Al6005-T5 lay-in lug & Stainless Steel Clip & A2-70 bolt



Item No.	Description
GR-G-CGL	Copper Grounding Lug

- Material: Copper lay-in lug & Stainless Steel Clip & A2-70 bolt



Bonding Jumper 断点连接件

Features

- Material: Braided Copper Wire & Stainless Steel Clip & A2-70 bolt
- High Pre-assembly
- Electrically connect spliced Rails
- Excellent electric conductivity

Item No.	Description
GR-G-BJ	Bonding Jumper



GRASOL TILT RACKING SYSTEM

倾斜支架系统

TILT SYSTEM

Grasol tilt racking system is developed to mount the module tilt a certain angle on a flat roof or ground. You can have the fixed or adjustable angle solution as 10-15deg, 5-30deg and 30-60deg according to your exact requirement. The special extruded aluminum rail, tilt-in module, clamps and legs should be pre-assembled to make the installation easy and quick for saving your labor cost and time. Besides, the customized length of rail will not require onsite weld and cut, keeping the appearance entirety, structural strength and anticorrosive performance.



Adjustable Tilt System

TECHNICAL INFORMATION

- Install site:** Low profile roof
- Tilt Angle:** 10~60deg
- Building Height:** up to 20m
- Max Wind Speed:** up to 60m/s
- Snow Load:** up to 1.4KN/m²
- Standard:** AS/NZS 1170 and other international Standard
- Material:** High Class Aluminum alloy
Stainless steel
- Color:** Natural
- Anticorrosive:** Anodized
- Warranty:** Ten years warranty
- Duration:** More than 20 years



Triangle Fixed Tilt System

BENEFITS

- Easy Installation:**
The tilt-in module can be put into the extruded rail from any section and the high pre-assembled leg, minimizing time and cost of installation.
- Flexibility and Adjustable:**
These systems accommodate most commercially available framed or frameless solar panels and diverse roof types.

- Safety and Reliability:**
The racking systems can stand up to the extreme weather complied with the AS/NZS 1170 and other international structure load standards by skilled engineers. The main support components have also been tested to guarantee its structure and load-carrying capacity.



Pre-assembly

COMPONENTS

Adjustable Tilt System 可调支架



Adjustable Drawing

Item No.	Description	Package
GR-AD-FL	Adjustable Front Leg	80PCS/CTN

Features

- Material: Al6005-T5 & A2-70 bolt
- High Pre-assembly
- Color: Natural



可调支架前支脚

GR-AD-FL

Item No.	Description	Package
GR-AD-RL10/15	Adjustable Rear Leg 10-15 deg	35PCS/CTN
GR-AD-RL15/30	Adjustable Rear Leg 15-30 deg	25PCS/CTN
GR-AD-RL30/60	Adjustable Rear Leg 30-60 deg	25PCS/CTN

Features

- Material: Al6005-T5 & A2-70 bolt
- High Pre-assembly
- Color: Natural



GR-AD-RL10/15

GR-AD-RL15/30

GR-AD-RL30/60

可调支架后支脚

COMPONENTS

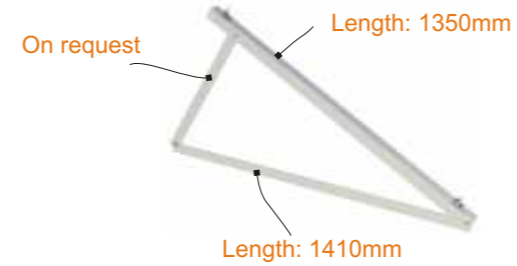
TRIANGLE FIX TILT BRACKET 三角固定倾斜支架

Features

- Material: Al6005-T5 & A2-70 bolt
- High Pre-assembly
- Another angles on request

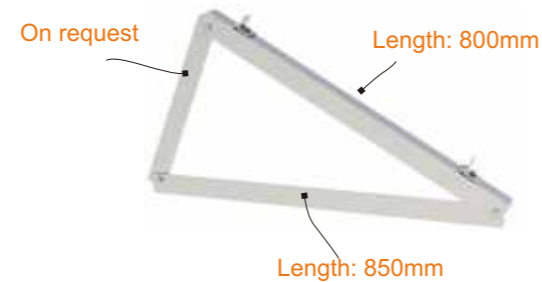
Item No.	Description
GR-FT15-01	Triangle Bracket 1# 15deg
GR-FT20-01	Triangle Bracket 1# 20deg
GR-FT30-01	Triangle Bracket 1# 30deg

1#: Suitable for module height up to 1.7 meters



GR-FT15-02	Triangle Bracket 2# 15deg
GR-FT20-02	Triangle Bracket 2# 20deg
GR-FT30-02	Triangle Bracket 2# 30deg

2#: Suitable for module height up to 1.1 meters



ADJUSTABLE TRIANGLE BRACKET 可调三角倾斜支架

Features

- Material: Al6005-T5 & A2-70 bolt
- High Pre-assembly
- Adjustable Angle: 10, 20, 30, 40, 50, 60

Item No.	Description
GR-AT-01	Adjustable Triangle Bracket 1#

1#: Suitable for module height up to 1.7 meters

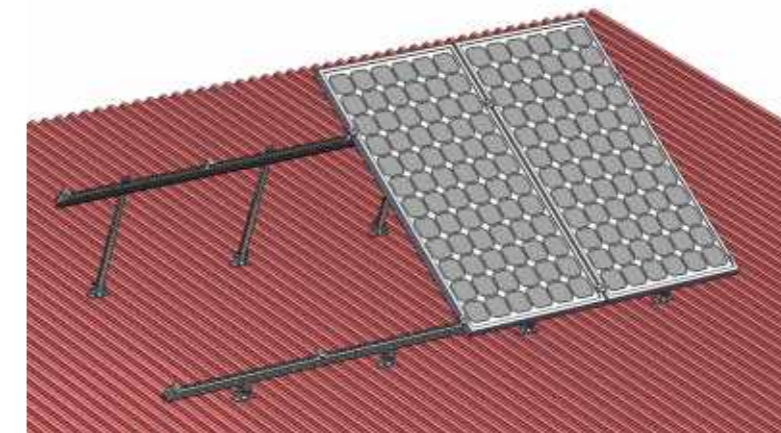


GR-AT-02	Adjustable Triangle Bracket 2#
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2#: Suitable for module height up to 1.1 meters

PROJECT EXAMPLE

ADJUSTABLE TILT SYSTEM 可调节倾斜支架工程案例



Solar Panels Size: 1580*808*46mm or 1585*826*46mm	Rail GR-R-	Front Leg GR-AD-FL	Front Leg GR-AD-RL	Inter Clamp GR-IC-F46	End Clamp GR-EC-F46	Rail Splice GR-R-SP
Adjustable 10/15 4 Panels install	3405mm 2 pcs	4	4	6	4	2
Adjustable 15/30 4 Panels install	3405mm 2 pcs	4	4	6	4	2
Adjustable 30/60 4 Panels install	3405mm 2 pcs	4	4	6	4	2

TRIANGLE FIXED TILT SYSTEM 三角固定倾斜支架工程案例



Solar Panels Size: 1580*808*46mm or 1585*826*46mm	Rail GR-R-	Triangle Bracket 1# GR-FT30-01	Inter Clamp GR-IC-F46	End Clamp GR-EC-F46	Rail Splice GR-R-SP
Fixed 30deg 3 Panels install	2560mm 2 pcs	2	4	4	2
Fixed 30deg 4 Panels install	3405mm 2 pcs	3	6	4	2

GRASOL BALLASTED MOUNTING SYSTEM

压载安装系统

BALLASTED MOUNTING

Grasol Ballasted Mounting System is a highly engineered solution that secures the array without damaging the flat roof. It is compatible with the usual framed modules and typically does not require roof penetrations. Made of lightweight and strong aluminum construction, the Grace Solar ballasted solution components are pre-assembled and pre-cut to prevent corrosion and save your installation time and labor cost.



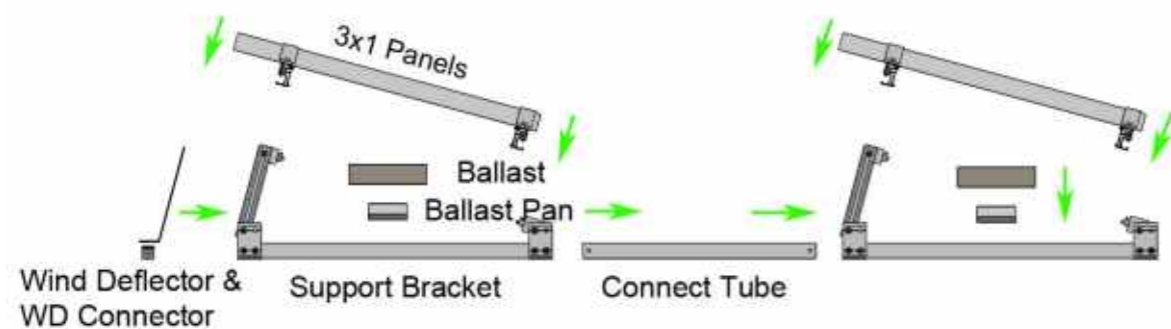
TECHNICAL INFORMATION

- Install site:** Flat roof
- Tilt Angle:** 5, 10, 15, 20deg
- Module Orientation:** Landscape
- Building Height:** up to 20m
- Max Wind Speed:** up to 60m/s
- Snow Load:** up to 1.4KN/m²
- Distributed Weight:** 10~25Kg/m²
- Standard:** AS/NZS 1170 and other international Standard
- Material:** High Class Aluminum alloy
Stainless steel
- Color:** Natural
- Anticorrosive:** Anodized
- Warranty:** Ten years warranty
- Duration:** More than 20 years

BENEFITS

- Easy Installation:**
The tilt-in module can be put into the extruded rail from any section and the high pre-assembled parts, minimizing time and cost of installation.
- Flexibility and Adjustable:**
These systems accommodate most commercially available framed or frameless solar panels and diverse roof types.
- Safety and Reliability:**
The racking systems can stand up to the extreme weather complied with the AS/NZS 1170 and other international structure load standards by skilled engineers. The main support components have also been tested to guarantee its structure and load-carrying capacity.

ASSEMBLY FIGURE



COMPONENTS

Ballasted Support Bracket 压载底座

Features

- Material: Al6005-T5
- High Class Anodized Aluminum
- High Pre-Assembly

Item No.	Description
GR-BM5-SB	Ballasted Support Bracket for 5deg
GR-BM10-SB	Ballasted Support Bracket for 10deg
GR-BM15-SB	Ballasted Support Bracket for 15deg
GR-BM20-SB	Ballasted Support Bracket for 20deg



GR-BM15-SB

Connect Tube 连接管

Features

- Material: Al6005-T5
- High Class Anodized Aluminum

Item No.	Description
GR-CT40-	Connect Tube



GR-CT40-

Ballast Pan 压载托盘

Features

- Material: Al5052-H24
- Aluminum Sheet Metal

Item No.	Description
GR-BP-200	Ballast Pan width 200mm



GR-BP-200

Wind Deflector and WD Connector 挡风板及挡风板连接件

Features

- Material: Al5052-H24 & SUS304
- Sheet Metal

Item No.	Description
GR-WD15-760	Wind Deflector 760mm for 15 deg
GR-WD20-760	Wind Deflector 760mm for 20 deg



GR-WD15-760
GR-WD20-760

GR-BM-DC	WD Connector
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GR-BM-DC

GRASOL UB-GROUND MOUNTING SYSTEM

UB 地面支架系统

Ground Array

Grasol UB-Ground Mounting System is applicable for the photovoltaic array system on open fields. The steadiness and safety of this system is compliant with the structural mechanics and construction acts.

For different foundation solutions, such as concrete with pre-buried bolt, direct buried and ground screw, the system can be modified to install. Material used include hot galvanized steel and anodized aluminum alloy, with great anti-corrosive suitable for outdoor using.

As per practical requirements, the system is able to be planned and customized in the factory to avoid welding and cut on the spot, saving your time and cost.



TECHNICAL INFORMATION

- Install site:** Open field
- Tilt Angle:** 10~60deg
- Building Height:** up to 20m
- Max Wind Speed:** up to 60m/s
- Snow Load:** up to 1.4KN/m²
- Standard:** AS/NZS 1170 and other international Standard
- Material:** High Class Aluminum alloy
Stainless Steel
Galvanized Steel
- Color:** Natural
- Anticorrosive:** Anodized & Hot Galvanized
- Warranty:** Ten years warranty
- Duration:** More than 20 years

BENEFITS

- Easy Installation:**
Planning and machining in the factory saving your time and cost
- Steady and Safety:**
Design and check the structure according to the structural mechanics and construction acts.
- Excellent Duration:**
For outdoor using, all the material selected with high class anti-corrosion protection.
- Great Flexibility:**
The ground array can be planned from kilo-watt to mega-watt.

FOUNDATION SOLUTION



Concrete Foudation (Pre-buried Bolt)



Directly Buried



Ground Screw

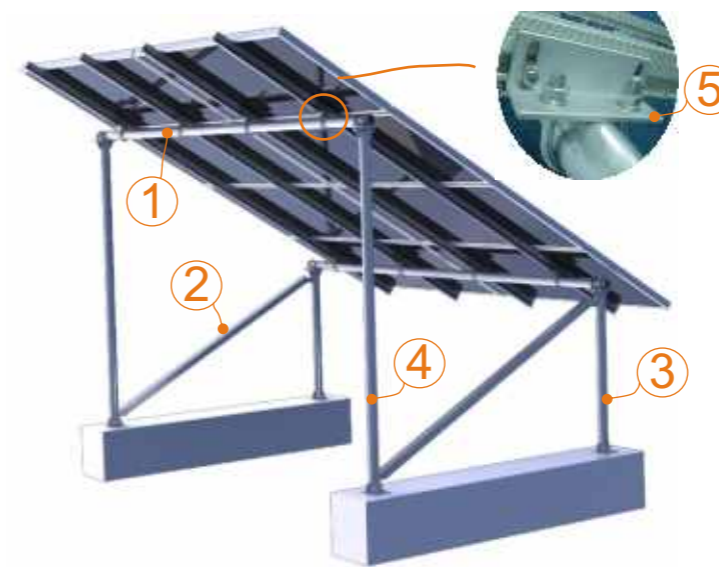
COMPONENTS

Integrated Type Ground Mounting 一体式地面支架

Features

- Material and finish: Hot galvanized steel Q235
- The Leg welded to be integral reduce the install step
- Foundation option: a. Concrete b. Ground Screw

Item No.	Description.
GR-CP-60/	Cross Pipe OD60
GR-AS-40/1820	Angle Steel Brace 1820mm with accessory
GR-GM-FL985	Front Leg 985mm with U bolt
GR-GM-BL1990	Back Leg 1990mm with U bolt



Concrete Foundation with Pre-buried Bolt

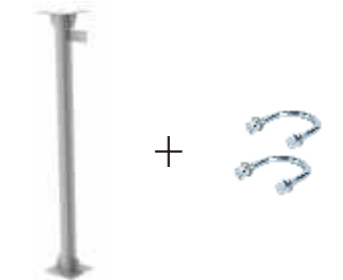
Item No.	Description
GR-GM-SK	Angle Splice for cross pipe and rail

Features

- Material: Al6005-T5 & A2-70 bolt
- High pre-assembly with the tilt-in module
- Cooperate with the U bolt to connect the pipe OD60mm with the Rail



1. GR-CP-60



2. GR-AS-40/1820



3. GR-GM-FL985
4. GR-GM-BL1990



5. GR-GM-SK



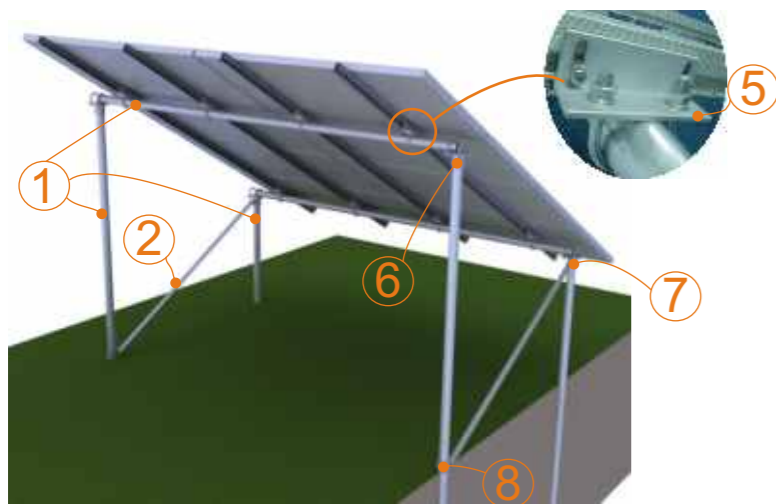
COMPONENTS

Cap Type Ground Mounting 管帽式地面支架

Features

- Material and finish: Hot galvanized steel Q235
- The steel cap is applied flexibly on various condition
- Foundation option: a. Concrete b. Ground Screw c. Directly Buried

Item No.	Description.
GR-GM-C01	Steel Cap 1# for Pipe OD60
GR-GM-C02	Steel Cap 2# for Pipe OD60
GR-GM-C03	Steel Cap 3# for Pipe OD60



Directly Buried



6. GR-GM-C01



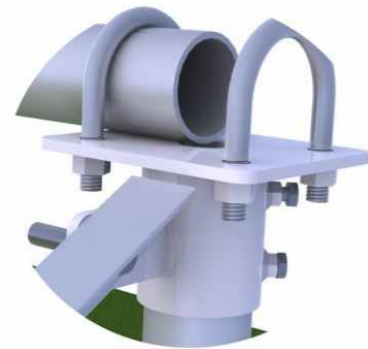
7. GR-GM-C02



8. GR-GM-C03



Installation of Steel Cap 1#



Installation of Steel Cap 2#



Installation of Steel Cap 3#

COMPONENTS

Accessories

GR-FA-UB60	U bolt kit M12x76, DACROMET
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U型螺栓组件

GR-GS-N68-1000	Ground Screw OD68*T2*1000, galvanized Fixed by set screw
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钻地螺栓

GR-GS-F68-1000	Ground Screw OD68*T2*1000, galvanized Weld with flange plate
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钻地螺栓 (带有法兰面)



Grace Solar Project in Greece



PROJECT EXAMPLE

Project Information

Solar Panels Size:	1580*808*46mm	Flood Height:	600mm
Tilt Angle:	30 Deg	Wind Speed:	Normal
Unit Array:	4*2 (8 pcs panels)	4*3 (12 pcs panels)	

Solution 1: Integrated Ground Mount

Product Item	Spec.	Qty	
		Array 4*2	Array 4*3
GR-R-3405	3405mm	4pcs	6pcs
GR-IC-F46	46mm	12pcs	18pcs
GR-EC-F46	46mm	8pcs	12pcs
GR-GM-SK	50*6*140mm	8pcs	12pcs
GR-GM-FL985	985mm	2pcs	2pcs
GR-GM-BL1990	1990mm	2pcs	2pcs
GR-AS-40/1820	1820mm	2pcs	2pcs
GR-CP-60/3200	3200mm	2pcs	X
GR-CP-60/4800	4800mm	X	2pcs



Concrete Foundation



PROJECT EXAMPLE

Solution 2: Cap type Ground Mount

Product Item	Spec.	Qty	
		Array 4*2	Array 4*3
GR-R-3405	3405mm	4pcs	6pcs
GR-IC-F46	46mm	12pcs	18pcs
GR-EC-F46	46mm	8pcs	12pcs
GR-GM-SK	50*6*140mm	8pcs	12pcs
GR-GM-C01	1#	2pcs	2pcs
GR-GM-C02	2#	2pcs	2pcs
GR-GM-C03	3#	2pcs	2pcs
GR-FA-UB60	M12x76	8pcs	8pcs
GR-CP-60/1985	1985mm	2pcs	2pcs
GR-CP-60/2990	2990mm	2pcs	2pcs
GR-AS-40/1820	1820mm	2pcs	2pcs
GR-CP-60/3200	3200mm	2pcs	X
GR-CP-60/4800	4800mm	X	2pcs

Note: The above is suitable for the directly buried solution.

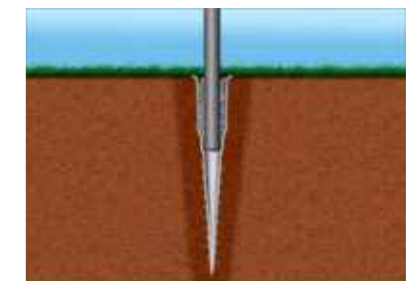
Foundation Option 2: Ground Screw

GR-GS-N68-1000	OD68*1000	4pcs	4pcs
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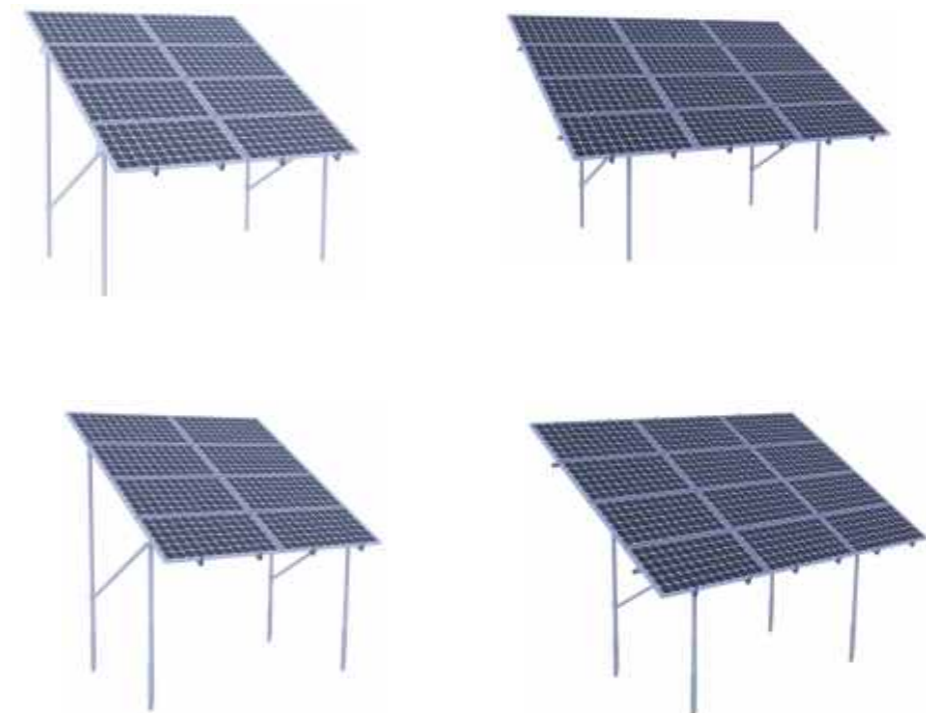
Note: The front and back leg can be shorted 500mm.



Directly Buried



Ground Screw Foundation



GRASOL PILE-GROUND MOUNTING SYSTEM

打桩式地面支架

INTRODUCE

Grasol Pile Ground System is applied for large commercial and utility PV systems on non-sandy ground, suitable for both framed and frameless module installation.

In Grasol Pile Ground System, Open Post can be pile into the ground 1-2 meters by pile machine quickly, then easily mounting the pre-assembled Al-Beam structure, B-Rail with clamps.

Our mission is to simplify your installation and ensure the structure safety. Grace Solar, your best choice.



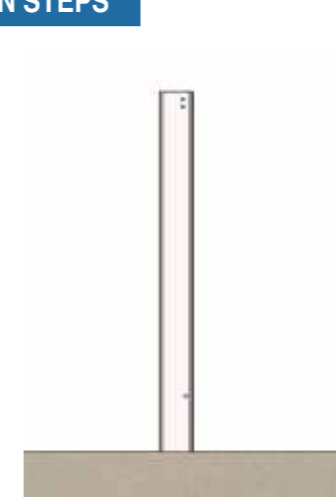
TECHNICAL

- Installation Site:** Open field
- Wind Load:** Up to 60m/s
- Snow Load:** up to 1.4KN/m²
- Applicable Module:** Framed or Frameless
- Module Orientation:** Portrait
- Rail Material:** Anodized Aluminum
- Post Material:** Hot-dip Galvanized Steel
- Adjustability:** Post height deviation: 10mm
Post angle deviation: 2°
Post verticality deviation: 2°
Pile driving depth: 1000-2000mm
- Soil Condition:** Non-sandy

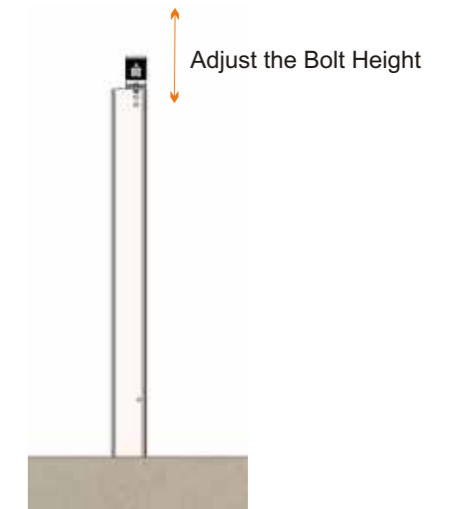
BENEFIT

- Easy Installation:** Parts have been high pre-assembly on factory to save your installation time
- Safety and Reliability:** Check and test the structure strictly to against the extreme weather condition
- Flexibility and Adjustable:** Smart design reduce the difficulty of the installation on the most condition
- 10-Year Warranty** Grace Solar provides a 10-years warranty for the material and structure

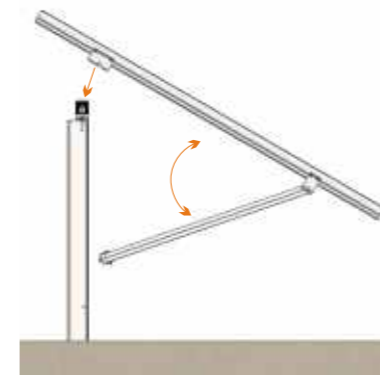
INSTALLATION STEPS



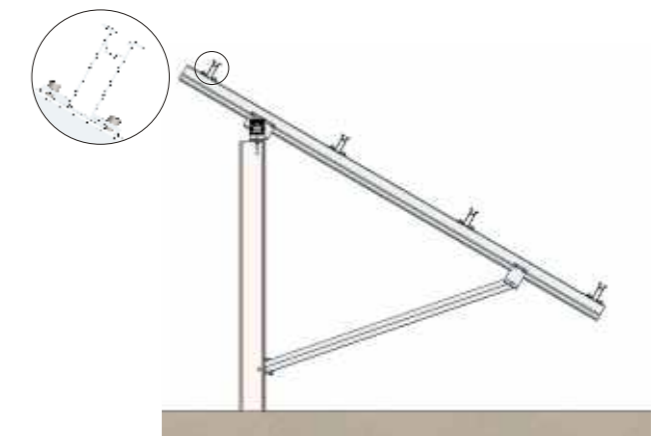
Step 1: Pile the Open Post by Pile Machine



Step 2: Install and adjust the Top Cap



Step 3: Install the Assembly of Beam



Step 4: Install the B-Rail by Rail Clamp



Step 5: Install the Modules



Finish



COMPONENTS

Hot Galvanized Steel Parts

Item No.	Description
GR-PG-OP2950	Open Post 2950mm

Material: Q235 Steel

Anodized Aluminum Parts

GR-PG-TC	Assembly of Top Cap
GR-PG-BA30	Assembly of Support Beam, 30deg -For Module length 1400~1700mm -High Pre-Assembly
GR-BR-4990	B-Rail 4990mm
GR-BR-SP	B-Rail Splice
GR-BR-C60	B-Rail Clamp

Material: Aluminum Alloy 6005-T5



1. GR-PG-OP2950
2. GR-PG-TC
2. GR-PG-BA30



GR-BR-4990



GR-BR-SP



GR-BR-C60

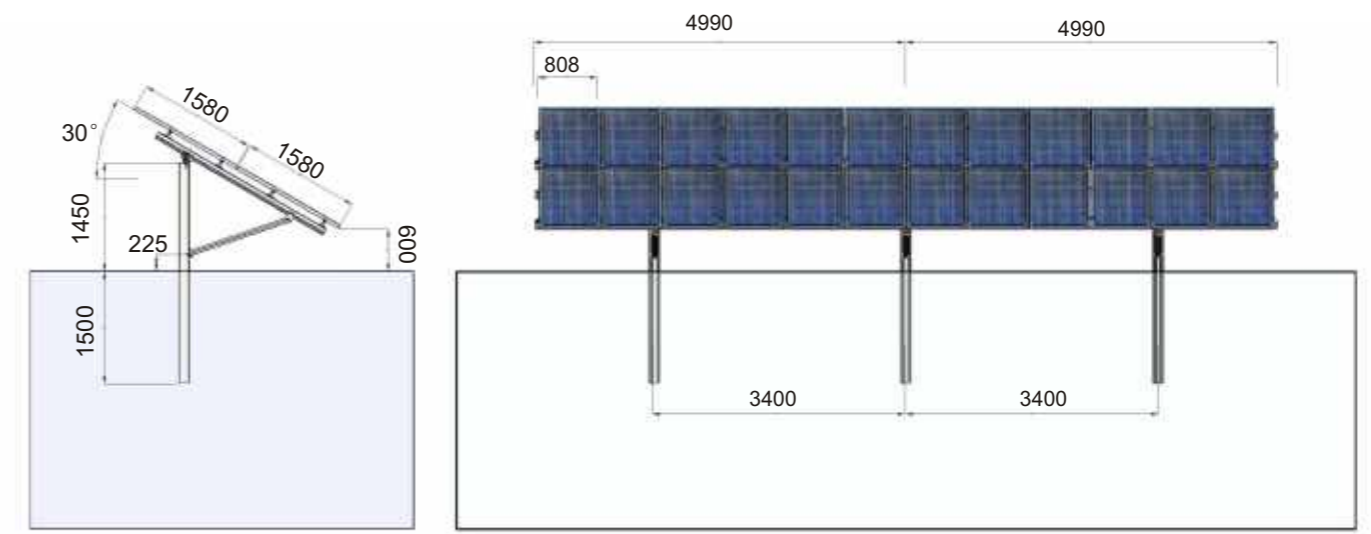


PROJECT EXAMPLE

Project Information

Solar Panels Size:	1580*808*46mm	Flood Height:	600mm
Tilt Angle:	30 Deg	Wind Speed:	<60m/s
Module Orientation:	Portrait	Soil Condition:	Non Sandy
Unit Array:	2*12 (24pcs panels)	Pile Height:	1500mm

2D Planning Drawing



Side View

Front View

Component List

Item	Description	Spec.	Qty
GR-BR-4990	B-Rail 4990	4990mm	8pcs
GR-BR-SP	B-Rail Splice	200mm	4pcs
GR-BR-C60	B-Rail Clamp	60mm	24pcs
GR-IC-F46	Inter Clamp Kit	46mm	44pcs
GR-EC-F46	End Clamp Kit	46mm	8pcs
GR-PG-BA30	Assembly of Support Beam, 30deg	30°	3pcs
GR-PG-TC	Aluminum Top Cap	80mm	3pcs
GR-PG-OP2950	Open Post 2950	2950mm	3pcs



GRASOL AL-GROUND MOUNTING SYSTEM

全铝合金地面支架

INTRODUCE

Grasol AL-Ground Mounting System is made of 100% aluminum to mount on concrete strip foundations or ground screws. It is featured with light weight, strong structure, and recyclable material.

In Grasol AL-Ground Mounting System, with pre-assembled Beam, the size of the legs and the B-Rail is manufactured in the factory avoid welding and cut on the spot, saving your time and cost.

Our mission is to simplify your installation and ensure the structure safety. Grace Solar, your best choice.



TECHNICAL

- Installation Site:** Open field
- Wind Load:** Up to 60m/s
- Snow Load:** 1.4KN/m
- Applicable Module:** Framed or Frameless
- Module Orientation:** Portrait
- Main Material:** 100% Anodized Aluminum
- Fastener Material:** Stainless Steel

BENEFIT

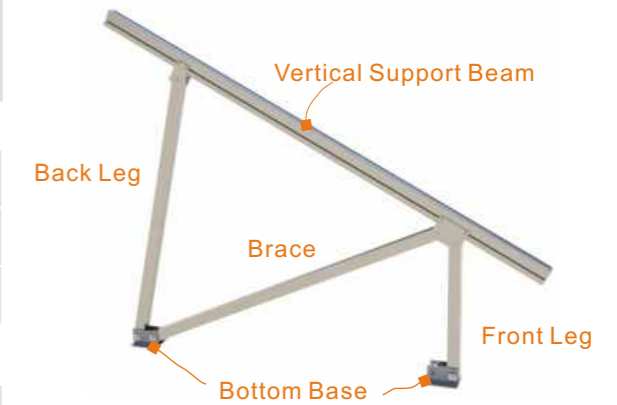
- Easy Installation**
Parts have been high pre-assembly on factory to save your installation time
- Safety and Reliability:**
Check and test the structure strictly to against the extreme weather condition
- Flexibility and Adjustable:**
Smart design reduce the difficulty of the installation on the most condition
- 10-Year Warranty**
Grace Solar provides a 10-years warranty for the material and structure



COMPONENTS

Anodized Aluminum Parts 阳极氧化铝合金件

Item No.	Description
GR-AG-BA-2600	Assembly of Support Beam, 2600mm -For 2xModule length 1400~1700mm -High Pre-Assembly
GR-AG-T-700	Front Leg, Square Tube, 700mm
GR-AG-T-1600	Back Leg, Square Tube, 1600mm
GR-AG-T-1814	Brace, Square Tube, 1814mm
GR-AG-B	Front and Bottom Base for AG



Purlin is the B-Rail.

PROJECT EXAMPLE

Project Information

Solar Panels Size:	1580*808*46mm	Flood Height:	600mm
Tilt Angle:	30 Deg	Wind Speed:	<60m/s
Module Orientation:	Portrait	Unit Array:	2*12 (24pcs panels)

Components List

Item	Description	Spec.	Qty
GR-BR-4990	B-Rail 4990	4990mm	8pcs
GR-BR-SP	B-Rail Splice	200mm	4pcs
GR-BR-C60	B-Rail Clamp	60mm	24pcs
GR-IC-F46	Inter Clamp Kit	46mm	44pcs
GR-EC-F46	End Clamp Kit	46mm	8pcs
GR-AG-BA-2600	Assembly of Support Beam, 2600mm	2600mm	3pcs
GR-AG-T-700	Front Leg, Square Tube, 700mm	700mm	3pcs
GR-AG-T-1600	Back Leg, Square Tube, 1600mm	1600mm	3pcs
GR-AG-T-1814	Brace, Square Tube, 1814mm	1814mm	3pcs
GR-AG-B	Front and Bottom Base for AG	160mm	3pcs



GRASOL POLE MOUNTING SYSTEM

立柱支架系统

POLE MOUNT SOLUTIONS



Full Figure



Grasol Pole Mount System is designed to install solar panels on a single pole. According to different conditions, several kinds of solutions are available.

Grasol Pole Mount System takes the importance of safety and duration. The systems have been calculated compliable with the structural mechanics and tested strictly. Material used include hot galvanized steel and anodized aluminum alloy, with great anti-corrosive suitable for outdoor using.



Detail Figure

TECHNICAL INFORMATION

- Install site:** Open field
- Tilt Angle:** 10~60deg
- Building Height:** up to 5m
- Max Wind Speed:** up to 60m/s
- Snow Load:** up to 1.4KN/m²
- Standard:** AS/NZS 1170 and other international Standard
- Material:** High Class Aluminum alloy
Stainless Steel
Galvanized Steel
- Color:** Natural
- Anticorrosive:** Anodized & Hot Galvanized
- Warranty:** Ten years warranty
- Duration:** More than 20 years

BENEFITS

- Easy Installation:**
Integrated Design for the support pole minimizing time and cost of installation
- Steady and Safety:**
Design and check the structure according to the structural mechanics and construction acts.
- Excellent Duration:**
For outdoor using, all the material selected with high class anti-corrosion protection.
- Great Flexibility:**
Tilt angle can be adjusted according to the actual needs on the install site.

COMPONENTS

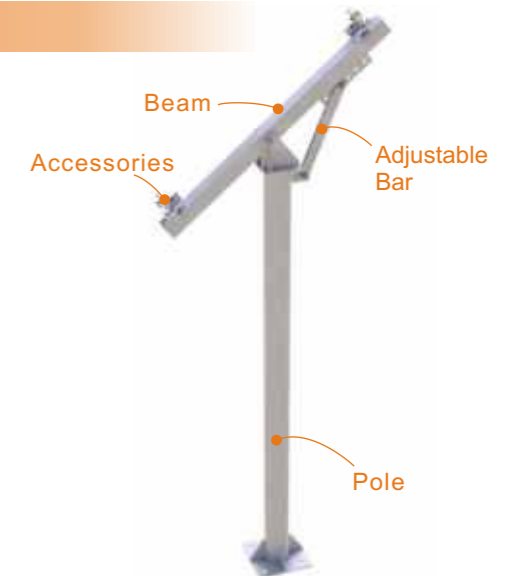
POLE MOUNT 2# 2片装立柱支架

Features

- Material: Hot galvanized steel Q235
- High integrated to reduce the bolt
- Install area of modules: up to 3.2 m² (wind speed < 45m/s)
- Foundation: concrete with pre-buried bolt

Item No.	Description
GR-PM02-01	Pole support for 2 pcs module (1580x808mm) - Pole OD89x1490mm x 1pc - Beam 50x900mm x 1pc - Adjustable bar x 1pc - Accessories and Fastens

Note: the length of the Beam and Pole can be customized for different conditions



POLE MOUNT 6# 6片装立柱支架

Features

- Material: Hot galvanized steel Q235
- High integrated to reduce the bolt
- Install area of modules: up to 8.3 m² (wind speed < 45m/s)
- Foundation: concrete with pre-buried bolt

Item No.	Description
GR-PM06-01	Pole support for 6 pcs module (1580x808mm) - Pole OD140x1490mm x 1pc - Beam 80x1300mm x 1pc - Purlin C100x2600mm x 2pcs - Adjustable bar x 1pcs - Accessories and Fastens

Note: the length of the Pole, Beam and Purlin can be customized for different conditions



COMPONENTS

POLE MOUNT 8# 8片装立柱支架

Features

- Material: Hot galvanized steel Q235
- High integrated to reduce the bolt
- Install area of modules: up to 11.5 m² (wind speed < 45m/s)
- Foundation: concrete with pre-buried bolt

Item No.	Description
GR-PM08-01	Pole support for 8 pcs module (1580x808mm) - Pole OD165x1490mm x 1pc - Beam 100x1800mm x 1pc - Purlin C100x2600mm x 3 pcs - Adjustable bar x 1pc - Accessories and fastens

Note: the length of the Pole, Beam and Purlin can be customized for different conditions



PROJECT EXAMPLE

Project Information

Solar Panels Size:	1580*808*46mm	Pole Height:	1500mm
Tilt Angle:	10-60 Deg	Wind Speed:	<45m/s
Foundaion:	Concrete with pre-buried bolt		
Array 1#	1*2 (2 pcs panels)		
Array 2#	3*2 (6 pcs panels)		
Array 3#	4*2 (8 pcs panels)		

Array 1#

Product Item	Spec.	Qty
		1x2
GR-R-1700	1700mm	2pcs
GR-IC-F46	46mm	2pcs
GR-EC-F46	46mm	4pcs
GR-PM02-01	1500mm	1pcs

Array 2#

Product Item	Spec.	Qty
		3x2
GR-R-2560	2560mm	4pcs
GR-IC-F46	46mm	8pcs
GR-EC-F46	46mm	8pcs
GR-PM06-01	1500mm	1pcs

Array 3#

Product Item	Spec.	Qty
		4x2
GR-R-3405	3405mm	4pcs
GR-IC-F46	46mm	12pcs
GR-EC-F46	46mm	8pcs
GR-PM08-01	1500mm	1pcs



GRASOL GROUNDING SCREW

钻地螺栓

INTRODUCE

Grace Solar has developed different series of screws to meet varied applications. The Ground Screws are installed with a number of specific aids and machines, perfectly perpendicular at the exact point after minutes. This screw-in foundation system is not only suitable for natural ground, but also for dense and even tarred surfaces. Applications are countless, from securing garden umbrellas, windy dryers and fences to carports, flag poles and traffic signs, solar panel systems, advertising boards and even outdoor building for events and expositions for its quick and easy created and removed advantages.



City and Parts



Docking Post and Trestle Stand



Fencing



Flag Poles and Banners



Garden and Leisure



Sheds and Containers



Solar Power Systems



Street Lamp



Traffic Sign

TECHNICAL INFORMATION

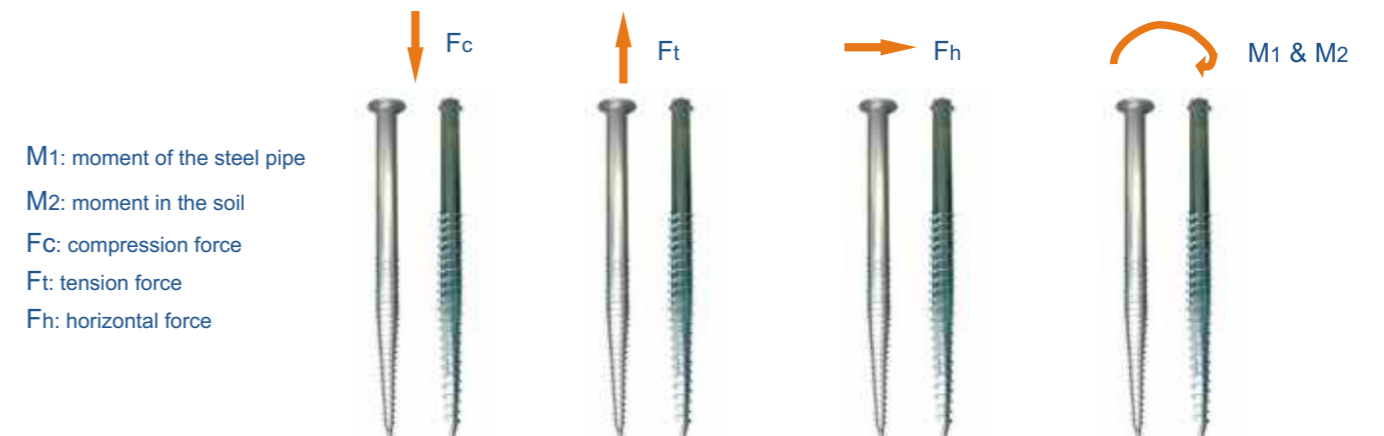
- Install site:** All types of Soil
- Pipe Material:** Q235B
- Pipe Diameters:** 50~140mm
- Pipe Length:** 1000~2000mm
- Pipe Thickness:** 2~4mm
- Standard:** GB50021-2001
GB50007-2002
GB50011-2001
- Anticorrosive:** Hot Dip Galvanized
- Warranty:** Ten years warranty
- Duration:** More than 20 years

BENEFITS

- Easy Installation:** Available with installation machines is easier and more quickly than other foundation solution to save your time and money.
- Steady and Safety:** Many kinds of types can be selected comply with the static load analysis and testing result to make sure the foundation safe.
- Quality System:** Grace Solar have the perfect system to ensure the product quality and have been certificated by the ISO.

Cross-section Values and Burdens of Grasol Ground Screws

Item No.	Tube Dia mm	Tube Thk mm	M1 KN*m	M2 KN*m	Fc KN	Ft KN	Fh KN
GR-GS 68x1000	68	2.0	1.587	1.811	10.50	5.50	3.50
GR-GS 76x1200	76	2.0	1.834	2.846	18.50	11.50	5.50
GR-GS 76x1600	76	3.5	3.386	4.398	35.00	21.50	8.50
GR-GS 76x2000	76	3.5	3.386	5.951	45.00	32.50	11.50
GR-GS 90x1200	88.9	3.5	4.729	3.881	30.00	16.50	7.50
GR-GS 90x2000	88.9	3.5	4.729	7.245	55.00	35.00	14.00
GR-GS 114x1200	114.3	3.5	8.058	4.916	35.00	20.50	9.50
GR-GS 114x2000	114.3	3.5	8.058	8.797	66.00	37.50	17.00





COMPONENTS

N Series

Features

- Material: Q235
- Finish: Hot-dip Galvanized
- Fixed by set screw

Item No.	Description
GR-GS-N68-1000	Ground Screw 68x1000xT2
GR-GS-N76-1200	Ground Screw 76x1200xT2
GR-GS-N76-1600	Ground Screw 76x1600xT3.5
GR-GS-N76-2000	Ground Screw 76x2000xT3.5



UB Ground Mounting installed on Ground Screw 68x1000



COMPONENTS

F Series

Features

- Material: Q235
- Finish: Hot-dip Galvanized
- Weld with Round Flange

Item No.	Description
GR-GS-F68-1000	Ground Screw 68x1000xT2, with Flange
GR-GS-F76-1200	Ground Screw 76x1200xT2, with Flange
GR-GS-F76-1600	Ground Screw 76x1600xT3.5, with Flange
GR-GS-F76-2000	Ground Screw 76x2000xT3.5, with Flange
GR-GS-F90-1200	Ground Screw 90x1200xT3.5, with Flange
GR-GS-F90-2000	Ground Screw 90x2000xT3.5, with Flange
GR-GS-F114-1200	Ground Screw 114x1200xT3.5, with Flange
GR-GS-F114-2000	Ground Screw 114x2000xT3.5, with Flange



Install by the Profession Person



Install by Machine

