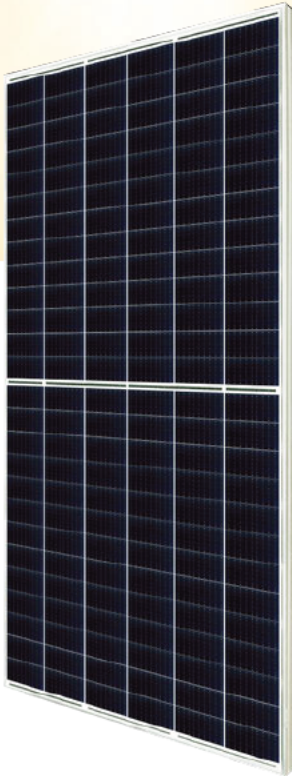




Preliminary Technical Information Sheet



BiHiKu6 Mono

BIFACIAL MONO PERC

550 W ~ 565 W

UP TO 30% MORE POWER FROM THE BACK SIDE

CS6Y-550 | 555 | 560 | 565MB-AG

MORE POWER



Module power up to 565 W
Module efficiency up to 20.8 %



Lower LCOE & BOS cost,
cost effective product for utility power plant



Comprehensive LID / LeTID mitigation
technology, up to 50% lower degradation



Compatible with mainstream trackers



Better shading tolerance

MORE RELIABLE



Minimizes micro-crack impacts



Heavy snow load up to 5400 Pa,
wind load up to 2400 Pa*



Enhanced Product Warranty on Materials
and Workmanship*



Linear Power Performance Warranty*

1st year power degradation no more than 2%
Subsequent annual power degradation no more than 0.45%

*According to the applicable Canadian Solar Limited Warranty Statement.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001 2015 / Quality management system
ISO 14001 2015 / Standards for environmental management system
OHSAS 18001 2007 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

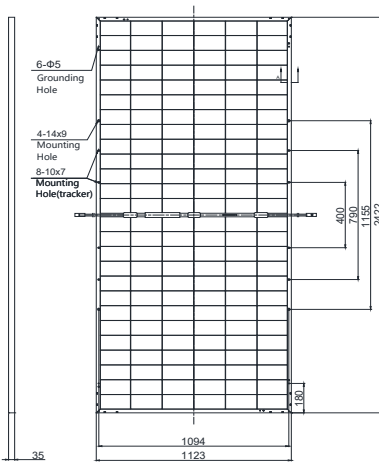
* As there are different certification requirements in different markets, please contact your local Canadian Solar sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

CANADIAN SOLAR INC. is committed to providing high quality solar products, solar system solutions and services to customers around the world. No. 1 module supplier for quality and performance/price ratio in IHS Module Customer Insight Survey. As a leading PV project developer and manufacturer of solar modules with over 40 GW deployed around the world since 2001.

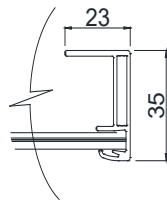
* For detailed information, please refer to the Installation Manual.

ENGINEERING DRAWING (mm)

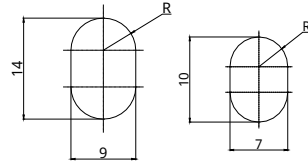
Rear View



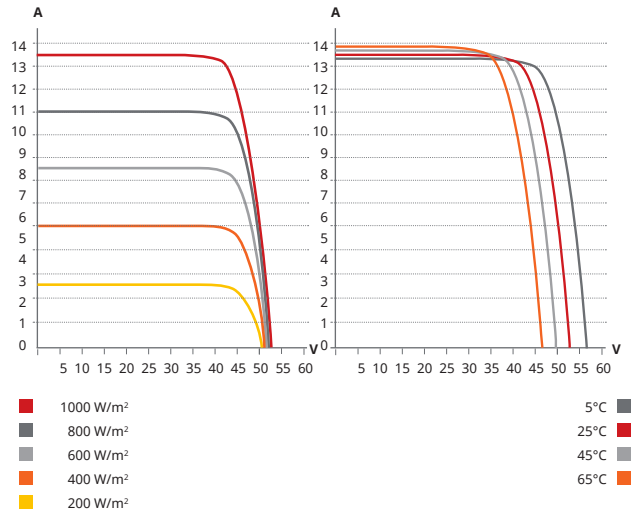
Frame Cross Section A-A



Mounting Hole



CS6Y-560MB-AG ~~REDACTED~~ - Matter No. 21-00750



ELECTRICAL DATA | STC*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)	Module Efficiency	
CS6Y-550MB-AG	550 W	43.6 V	12.62 A	52.4 V	13.41 A	20.2%	
	5% Bifacial Gain**	578 W	43.6 V	13.26 A	52.4 V	14.08 A	21.3%
	10%	605 W	43.6 V	13.88 A	52.4 V	14.75 A	22.2%
	20%	660 W	43.6 V	15.14 A	52.4 V	16.09 A	24.3%
	30%	715 W	43.6 V	16.41 A	52.4 V	17.43 A	26.3%
CS6Y-555MB-AG	555 W	43.8 V	12.68 A	52.6 V	13.46 A	20.4%	
	5% Bifacial Gain**	583 W	43.8 V	13.31 A	52.6 V	14.13 A	21.4%
	10%	611 W	43.8 V	13.96 A	52.6 V	14.81 A	22.5%
	20%	666 W	43.8 V	15.22 A	52.6 V	16.15 A	24.5%
	30%	722 W	43.8 V	16.49 A	52.6 V	17.50 A	26.5%
CS6Y-560MB-AG	560 W	44.0 V	12.73 A	52.8 V	13.51 A	20.6%	
	5% Bifacial Gain**	588 W	44.0 V	13.37 A	52.8 V	14.19 A	21.6%
	10%	616 W	44.0 V	14.00 A	52.8 V	14.86 A	22.6%
	20%	672 W	44.0 V	15.28 A	52.8 V	16.21 A	24.7%
	30%	728 W	44.0 V	16.55 A	52.8 V	17.56 A	26.8%
CS6Y-565MB-AG	565 W	44.2 V	12.79 A	53.0 V	13.56 A	20.8%	
	5% Bifacial Gain**	593 W	44.2 V	13.43 A	53.0 V	14.24 A	21.8%
	10%	622 W	44.2 V	14.08 A	53.0 V	14.92 A	22.9%
	20%	678 W	44.2 V	15.35 A	53.0 V	16.27 A	24.9%
	30%	735 W	44.2 V	16.64 A	53.0 V	17.63 A	27.0%

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.
 ** Bifacial Gain: The additional gain from the back side compared to the power of the front side at the standard test condition. It depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

ELECTRICAL DATA | NMOT*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)
CS6Y-550MB-AG	412 W	40.8 V	10.10 A	49.4 V	10.81 A
CS6Y-555MB-AG	415 W	41.0 V	10.13 A	49.6 V	10.85 A
CS6Y-560MB-AG	419 W	41.2 V	10.17 A	49.8 V	10.89 A
CS6Y-565MB-AG	423 W	41.4 V	10.22 A	50.0 V	10.93 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline
Cell Arrangement	156 [2x (13 x 6)]
Dimensions	2422 x 1123 x 35 mm (95.4 x 44.2 x 1.38 in)
Weight	34.4 kg (75.8 lbs)
Front / Back Glass	2.0 mm heat strengthened glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 diodes
Cable	4.0 mm ² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	Portrait: 400 mm (15.7 in) (+) / 280 mm (11.0 in) (-); landscape: 1400 mm (55.1 in); leap-frog connection: 2000 mm (78.7 in)*
Connector	T4 series or MC4
Per Pallet	30 pieces
Per Container (40' HQ)	540 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

ELECTRICAL DATA

Operating Temperature	-40°C ~ +85°C
Max. System Voltage	1500 V (IEC/UL) or 1000 V (IEC/UL)
Module Fire Performance	TYPE 3 (UL 61730) or CLASS C (IEC61730)
Max. Series Fuse Rating	30 A
Application Classification	Class A
Power Tolerance	0 ~ +10 W
Power Bifaciality*	70 %

* Power Bifaciality = $P_{max_{rear}} / P_{max_{front}}$, both $P_{max_{rear}}$ and $P_{max_{front}}$ are tested under STC, Bifaciality Tolerance: $\pm 5\%$

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.35 % / °C
Temperature Coefficient (Voc)	-0.27 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	41 \pm 3°C

PARTNER SECTION



* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. Canadian Solar Inc. reserves the right to make necessary adjustment to the information described herein at any time without further notice.

Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.



**INSTALLATION
MANUAL OF BIFACIAL
MODULE**

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1.0 GENERAL INFORMATION

This general manual provides important safety information relating to the installation, maintenance and handling of bifacial double glass solar modules.

Professional installer must read these guidelines carefully and strictly follow these instructions. Failure to follow these instructions may result in death, injury or property damage. The installation and handling of PV modules require professional skills and should only be performed by qualified professionals. The installers must inform end-users (consumers) the aforesaid information accordingly.

The word “module” or “PV module” used in this manual refers to one or more double glass solar modules. This manual is only valid for the bifacial double glass module types CS3W-PB-AG, CS3W-MB-AG, CS3U-MB-AG, CS3K-MB-AG, CS3U-PB-AG, CS3K-PB-AG, CS3Y-MB-AG, CS3Y-PB-AG, CS6W-MB-AG, CS7N-MB-AG and CS7L-MB-AG. Please retain this manual for future reference.

We recommend visiting www.csisolar.com regularly for the most updated version of bifacial module installation manual.

1.1 INSTALLATION MANUAL DISCLAIMER

The information contained in this manual is subject to change by Canadian Solar without prior notice. Canadian Solar gives no warranty of any kind whatsoever, either explicitly or implicitly, with respect to the information contained herein.

In the event of any inconsistency among different language versions of this document, the English version shall prevail. Please refer to our product lists and documents published on our website at: www.csisolar.com as these lists are updated on a regular basis.

1.2 LIMITATION OF LIABILITY

Canadian Solar shall not be held responsible for damages of any kind, including – without limitation – bodily harm, injury or damage to property, in connection with handling PV modules, system installation, or compliance or non-compliance with the instructions set forth in this manual.

2.0 SAFETY PRECAUTIONS



Warning

Before attempting to install, wire, operate and/or service the module and other electrical equipment, all instructions should be read and understood. PV module connectors pass direct current (DC) when exposed to sunlight or other light sources. Contact with electrically active parts of the module, such as terminals, can result in injury or death, irrespective of whether or not the module and the other electrical equipment have been connected.



Avertissement

Toutes les instructions devront être lues et comprises avant de procéder à l'installation, le câblage, l'exploitation et/ou l'entretien des panneaux.

Les interconnexions des panneaux conduisent du courant continu (CC) lorsque le panneau est exposé à la lumière du soleil ou à d'autres sources lumineuses. Tout contact avec des éléments sous tension du panneau tels que ses bornes de sortie peut entraîner des blessures ou la mort, que le panneau soit connecté ou non.

General Safety

All modules must be installed by licensed electricians in accordance to the applicable electrical codes such as, the latest National Electrical Code (USA) or Canadian Electric Code (Canada) or other national or international applicable electrical codes.



Protective clothing (non-slip gloves, clothes, etc.) must be worn during installation to prevent direct contact with 30 V DC or greater, and to protect hands from sharp edges.



Prior to installation, remove all metallic jewelry to prevent accidental exposure to live circuits.



When installing modules in light rain, morning dew, take appropriate measures to prevent water ingress into the connector.



Do not allow children or unauthorized persons near the installation site or module storage area.

- Use electrically insulated tools to reduce the risk of electric shock.
- If the disconnects and over current protection devices (OCPDs) cannot be opened or the inverter cannot be powered down, cover the fronts of the modules in the PV array with an opaque material to stop the production of electricity when installing or working on a module or wiring.
- Carry the panels using both hands and do not use the junction box or cables as a grip
- Do not allow the panels to sag or bow under their own weight when being carried.
- Do not subject panels to loads or stresses, e.g., leaning on them or through the placing of weight on them.
- Do not install modules in strong wind.
- Do not use or install broken modules.
- Do not contact module surface if the front or rear glass is broken. This may cause electric shock.
- Do not attempt to repair any part of the module The PV module does not contain any serviceable parts.

- Do not open the cover of the junction box at any time.
- Do not disassemble a module or remove any module part.
- Do not artificially concentrate sunlight on a module.
- Do not connect or disconnect modules when current from the modules or an external source is present.

3.0 MECHANICAL / ELECTRICAL SPECIFICATIONS

Module electrical ratings are measured under Standard Test Conditions (STC) of 1000 W/m² irradiance, with an AM1.5 spectrum, and a cell temperature of 25°C. Detailed electrical and mechanical characteristics of Canadian Solar crystalline silicon PV modules can be found in Annex A (Module Specifications) on www.csisolar.com. Main electrical characteristics at STC are also stated on each module label. Please refer to the datasheet or the product nameplate for the maximum system voltage.

Under certain conditions, a module may produce more current or voltage than its Standard Test Conditions rated power. As a result, the module short-circuit current under STC should be multiplied by 1.25, and a correction factor should be applied to the open-circuit voltage (see Table 1 below), when determining component ratings and capacities.

Table 1: Low temperature correction factors for open-circuit voltage

Lowest Expected Ambient Temperature (°C/°F)	Correction Factor
24 to 20 / 76 to 68	1.02
19 to 15 / 67 to 59	1.04
14 to 10 / 58 to 50	1.06
9 to 5 / 49 to 41	1.08
4 to 0 / 40 to 32	1.10
-1 to -5 / 31 to 23	1.12
-6 to -10 / 22 to 14	1.14
-11 to -15 / 13 to 5	1.16
-16 to -20 / 4 to -4	1.18
-21 to -25 / -5 to -13	1.20
-26 to -30 / -14 to -22	1.21
-31 to -35 / -23 to -31	1.23
-36 to -40 / -32 to -40	1.25

Alternatively, a more accurate correction factor for the open-circuit voltage can be calculated using the following formula:

$$C_{Voc} = 1 - \alpha_{Voc} \times (25 - T)$$

T (°C) is the lowest expected ambient temperature at the system installation site.

α_{Voc} (%/°C) is the voltage temperature coefficient of the selected module (refer to corresponding datasheet).

OCPD rating selection should be done per the following guidance, where the minimum OCPD rating possible is determined by calculating the expected maximum circuit current for the PV system, and the maximum OCPD rating constrained by the IEC 61215: 2016 and UL61730 standard requirements for the certified PV modules.

Minimum string fuse rating < X ≤ Maximum string fuse rating.

The maximum string fuse ratings can be found in ANNEX A: Mechanical and Electrical Ratings for all the certified Canadian Solar bifacial module types.

The minimum string fuse rating for compliance with NEC: 2017 code and IEC 62548: 2016 requirement is suggested to be determined as follows:

Minimum string fuse rating = $I_{sc_{STC}} \times 1.25 \times \text{Max} (1.175, I_{mpp_{\alpha}} \div I_{mpp_{STC}})$.

$I_{mpp_{\alpha}}$ = the highest 3-hour current average resulting from the simulated local simultaneous irradiances on the front and rear sides of the PV array accounting for elevation and orientation.

$I_{sc_{STC}}$ = the listed short circuit current at 0% bifacial gain on the PV module datasheet or nameplate label.

$I_{mpp_{STC}}$ = the listed MPP operating current at 0% bifacial gain on the PV module datasheet or nameplate label.

An assembly, together with its overcurrent device(s), that is listed for continuous operation at 100 percent of its rating shall be permitted to be used at 100 percent of its rating, and therefore shall not require the additional 1.25 multiplier.

Electrical calculations and design must be performed by a competent engineer or consultant.

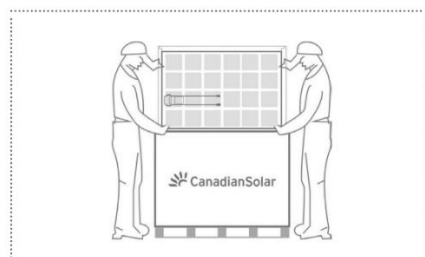
Please contact Canadian Solar’s technical support team for additional information pertaining to engineering optimization and approval of project specific module string lengths.

4.0 UNPACKING AND STORAGE

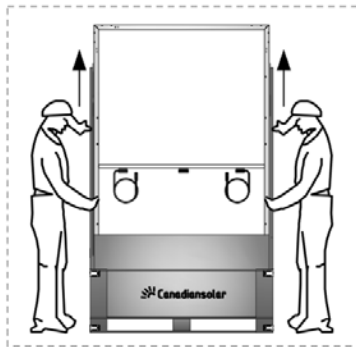
NOTICE

PRECAUTIONS

- Modules should be stored in a dry and ventilated environment to avoid direct sunlight and moisture. If modules are stored in an uncontrolled environment, the storage time should be less than 3 months and extra precautions should be taken to prevent connectors from being exposed to moisture or sunlight, like using connector endcaps. . Connector endcaps are available upon request.
- When unloading module pallets from containers, please use a fork lift to remove the module pallets and the forklift should be close to the ground in order to avoid the top of module pallets touching the top of the cabinet door. For 6W-MB-AG, the thickness of forklift teeth should be less than 75mm and the length of the forklift teeth should be longer than 2300mm when unloading the module pallets with short side. For unloading CS7N-MB-AG and CS7L-MB-AG modules, the length of the forklift teeth should be longer than 1250mm and the width of forklift teeth should be wider than 600mm (from outer edge to outer edge).
- Unpack module pallets carefully, following the steps shown on the pallet. Unpack, transport and store the modules with care.
- Modules must always be unpacked and installed by two people. Always use both hands when handling modules with gloves.



- For vertical package, unpacking and installing should be careful, for more information, please contact Canadian solar technical support team.



- **Do not** lift modules by their wires or junction box, lift them by the frame.
- **Do not** place excessive loads on the module or twist the module.
- **Do not** carry modules on your head.
- **Do not** drop or place objects (such as tools) on the modules.
- **Do not** use sharp instruments on the modules.
- **Do not** leave modules unsupported or unsecured.
- **Do not** stand, step, walk and/or jump on modules under any circumstances. Localized heavy loads may cause severe micro-cracks at cell level, which in turn may compromise module reliability and void Canadian Solar’s warranty.



- **Do not** change the wiring of bypass diodes.
- Keep all electrical contacts clean and dry at all times.
- **Do not** expose the modules and its electrical contacts to any unauthorized chemical substance (e.g. oil, lubricant, pesticide, etc.).

PRODUCT IDENTIFICATION

Each module has three identical barcodes (one in the

laminated under the front glass, the second on the rear side of the module and the third on the frame) that act as a unique identifier. Each module has a unique serial number containing 14 digits or 16 digits.

A nameplate is also affixed to the rear of each module. This nameplate specifies the model type, as well as the main electrical and safety characteristics of the module.

5.0 MODULE INSTALLATION



PRECAUTIONARY MEASURES AND GENERAL SAFETY

- Prior to installing modules, please obtain information about any requirements and necessary approvals for the site, installation and inspection from the relevant authorities.
- Check applicable building codes to ensure that the construction or structure (roof, facade, support, etc.) can bear the module system load.
- Canadian solar modules have been qualified for Application Class A (equivalent to Safety Class II requirements). Modules rated under this class should be used in systems operating at voltage above 50V or power above 240W, where general contact access is anticipated.
- Canadian Solar bifacial double glass modules have been certified as Type 29 according to UL 61730 and as Class A or Class C for fire performance according to IEC 61730-2 for fire class performance, please refer to the datasheet or the product nameplate for the detailed types.
- Consult your local authority for guidelines and requirements for building or structural fire safety.

UL61730 SYSTEM FIRE RATING REQUIREMENTS

- The fire rating of this module is only valid when the product is installed as specified in the mechanical mounting instructions.
- When installing the modules, ensure the assembly is mounted over a fire-resistant roof covering rated for the application.
- Photovoltaic systems composed of UL 61730 certified

modules mounted on a UL 2703 certified mounting system should be evaluated in combination with roof coverings in accordance with UL 61730 standard, with respect to meeting the same fire classification as the roof assembly.

- Mounting systems with a System Fire Class Rating (Class A, B or C), tested in conjunction with fire rated “Type 29” rated modules, are considered acceptable for use with Canadian Solar modules, provides the mounting system does not violate any other requirements of this manual.
- Any mounting system limitations on inclination or accessories required to maintain a specific System Fire Class Rating should be clearly specified in the installation instructions and UL 2703 certification of the mounting system supplier.

ENVIRONMENTAL CONDITIONS

- The module is intended for use in general open-air climates, as defined in IEC 60721-2-1: Classification of environmental conditions Part 2-1: Environmental conditions appearing in nature. Temperature and humidity.
- Please consult the Canadian Solar technical support department for more information on the use of modules in special climates, such as an altitude greater than 2000m, heavy snow, severe hail storm, hurricane, etc.
- **Do not** install modules near open flames or flammable materials.
- **Do not** immerse modules in water or constantly expose modules to water (either fresh or salt, i.e. from fountains, sea spray).
- Exposing modules to salt (i.e. marine environments) or sulfur (i.e. sulfur sources, volcanoes) incurs the risk of module corrosion.
- Do not expose modules and their connectors to any unauthorized chemical substances (e.g. oil, lubricant, pesticide, etc.), as modules may incur damages.
- Canadian solar modules have passed salt mist corrosion resistance test according to IEC 61701, but

the corrosion may still occur on where the modules frame is connected to the bracket or where the grounding is connected. Should the installation location be near the ocean, Canadian solar recommends stainless steel or aluminum materials be used in the areas with direct contact with the PV modules, and the connection point should be protected with anti-corrosion measures. For more information, please contact Canadian solar technical support team.

- CS7L-MB-AG & CS7N-MB-AG modules shall not be used in any rooftop application.
- Failure to comply with these instructions will void Canadian Solar warranty.

INSTALLATION REQUIREMENTS

- Ensure that the module meets the general technical system requirements.
- Ensure that other systems components do not damage the module mechanically or electrically.
- Modules can be wired in series to increase voltage or in parallel to increase current. To connect modules in series, connect the cables from the positive terminal of one module to the negative terminal of the next module. To connect in parallel, connect the cables from the positive terminal of one module to the positive terminal on the next module.
- The quantity of bypass diodes in the module’s junction box provided may vary depending on the model series.
- Only connect the quantity of modules that corresponds to the voltage specifications of the inverters used in the system. In addition, modules must not be connected together to create a voltage higher than the maximum permitted system voltage stated on the module nameplate, even under the worst local temperature conditions (see Table 1 for the correction coefficients that apply to open-circuit voltage).
- A maximum of two strings can be connected in parallel without using an over-current protection device (fuses, etc.) incorporated in series within each string. Three or more strings can be connected in parallel if an appropriate and certified over-current protection device is installed in series within each string. And it

shall be ensured in the PV system design that the reverse current of any particular string is lower than the module maximum fuse rating at any circumstances.

- Only modules with similar electrical parameters should be connected in the same string to avoid or minimize mismatch effects in arrays.
- To minimize risk in the event of an indirect lightning strike, avoid forming loops with the wiring when designing the system.
- The recommended maximum series fuse rating is stated in a table in the Annex A.
- Modules should be safely fixed to bear all expected loads, including wind and snow loads.
- After the installation of double glass modules, a 30 mm deflection for framed module is allowed.
- For framed modules, a minimum clearance of 6.5 mm (0.25 in) between modules is required to allow thermal expansion of the frames and modules.

OPTIMUM ORIENTATION AND TILT

- To maximize the annual yield, please calculate the optimum orientation and tilt for PV modules in that specific installation site. The highest yields are achieved when sunlight shines perpendicularly onto the PV modules.

AVOID SHADING

- Even minor partial shading (e.g. from dirt deposits) reduces yields. A module can be considered to be unshaded if its entire surface is free from shading all year round. Sunlight should be able to reach at least the module even on the shortest day of the year.
- For optimizing the power generation of the rear side of bifacial modules, obstacles between modules and the mounting ground should be avoided as much as possible
- Constant shading conditions can affect module service lifetime, due to accelerated ageing of the encapsulation material and thermal stress on the bypass diodes.

RELIABLE VENTILATION

- Bifacial modules use direct, reflected, or diffuse

sunlight on the backside to generate additional power. Therefore, bifacial modules are not suggested to be used in building attached photovoltaic systems (BAPV). If BAPV, or similar mounting is still required, sufficient clearance of at least 10 cm (3.94 in) between the module and the mounting surface needs to be provided to allow cooling air to circulate around the back of the module. This also allows condensation or moisture to dissipate.

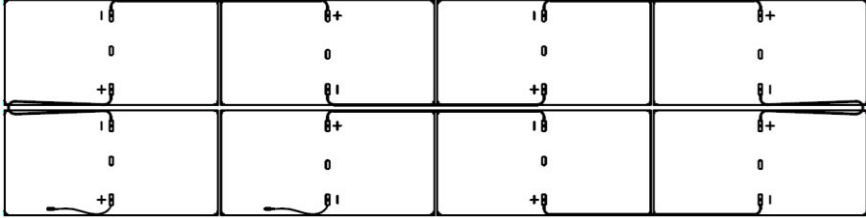
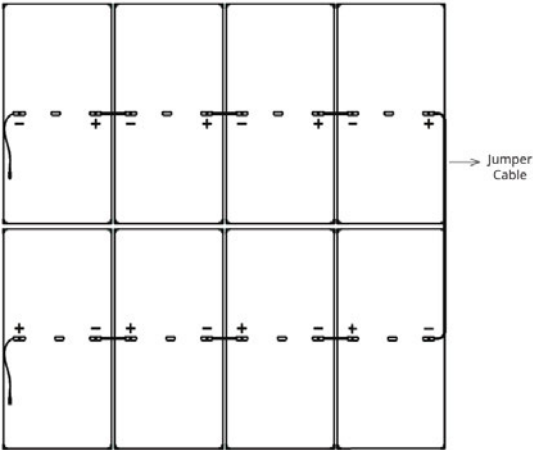
- According to UL61730, any other specific clearance required for maintaining a system fire rating should prevail. Detailed clearance requirements pertaining to system fire ratings must be provided by your racking supplier.

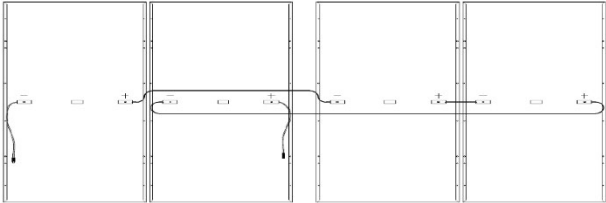
5.1 MODULE WIRING

CORRECT WIRING SCHEME

- Ensure that the wiring is correct before starting up the system. If the measured open circuit voltage (Voc) and short-circuit current (Isc) differ from the specifications, this indicates that there is a wiring fault.
- When modules have been pre-installed, but the system has not been connected to the grid yet, each module string should be kept under open-circuit conditions and proper actions should be taken to avoid dust and moisture penetration inside the connectors.
- Do not connect different connectors (brand and model) together.
- For CS3W, CS3U, CS3Y, CS3K, CS6W, CS7N and CS7L series modules, Canadian Solar offers several cable length options to match various system configurations, which are shown in table 2:
- On below figures, bold lines represent cable installation pathways, while + and - connector correspond to positive and negative module terminals respectively.
- Cables should always be fastened on module frames or mounting rails, in order to avoid shading on module rear side.
- In case where a cable connection method not included in below table is used, please confirm suitable cable length with Canadian Solar's sales representative.

Table 2: System Cable Scheme for CS3W, CS3U, CS3Y, CS3K, CS6W, CS7N and CS7L modules

Module types	Recommended wiring configurations
<p>CS3U-MB-AG, CS3K-MB-AG, CS3U-PB-AG, CS3K-PB-AG, CS3W-PB-AG, CS3W-MB-AG, CS3Y-PB-AG, CS3Y-MB-AG, CS6W-MB-AG, CS7N-MB-AG, CS7L-MB-AG</p>	<p>Landscape installation two rows: CS3U/CS3W/CS3Y/CS6W/CS7L/CS7N Cable length per lead = 1400 mm CS3K Cable length per lead = 1250 mm</p>
	 <p>Note: Adjacent modules in the same row need to be rotated 180 degrees for proper installation.</p>
	<p>Portrait installation one row: CS3U/CS3K/CS3W Cable length per lead = 400 mm (+), 280 mm (-) CS3Y/CS6W Cable length per lead = 410 mm (+), 290 mm (-) CS7L/CS7N Cable length per lead = 460 mm (+), 340 mm (-)</p>
<p>Module types</p>	<p>Recommended wiring configurations (continued)</p>
<p>CS3U-MB-AG, CS3K-MB-AG, CS3U-PB-AG, CS3K-PB-AG, CS3W-PB-AG, CS3W-MB-AG, CS3Y-MB-AG, CS3Y-PB-AG, CS6W-MB-AG, CS7N-MB-AG, CS7L-MB-AG</p>	<p>Portrait installation two rows: CS3U/CS3W Cable length = 400 mm (+), 280 mm (-) & 1800 mm jumper cable CS3K Cable length = 400 mm (+), 280 mm(-) & 1400 mm jumper cable CS3Y/CS6W Cable length = 410 mm (+), 290 mm (-) & 2000 mm jumper cable CS7L Cable length = 460 mm (+), 340 mm (-) & 2000 mm jumper cable CS7N Cable length = 460 mm (+), 340 mm (-) & 2150 mm jumper cable</p>
	 <p>Note: Modules in adjacent rows need to be rotated 180 degrees for proper installation.</p>

<p>CS3U-MB-AG, CS3K-MB-AG, CS3U-PB-AG, CS3K-PB-AG, CS3W-PB-AG, CS3W-MB-AG, CS3Y-MB-AG, CS3Y-PB-AG CS6W-MB-AG</p>	<p>Portrait installation one row: (Leap-frog for single-axis tracker) CS3U Cable length = 1670 mm (+), 1670 mm (-) CS3W/CS3Y Cable length = 1850 mm (+), 1850 mm (-) CS6W Cable length = 2000 mm (+), 2000 mm (-)</p>
	

The maximum distance between two adjacent module frames should be within 50 mm (1.96 in) for the side with mounting clamps, and within 25 mm (0.98in) for the side without mounting clamps, in order to meet the system cable scheme.

CORRECT CONNECTION OF CONNECTORS

- Make sure that all connections are safe and properly mated. The PV connector should not be subject to stress from the exterior. Connectors should only be used to connect the circuit. They should never be used to turn the circuit on and off.
- Connectors are not waterproof when unmated. When installing modules, connector should be connected to each other as soon as possible or appropriate measures (like using connector endcaps) should be taken to avoid moisture and dust penetrating into the connector.
- Do not clean or precondition the connectors using lubricants or any unauthorized chemical substances.

USE OF SUITABLE MATERIALS


- Only use dedicated solar cable and suitable connectors (wiring should be sheathed in a sunlight-resistant conduit or, if exposed, should itself be sunlight-resistant) that meet local fire, building and electrical regulations. Please ensure that all wiring is in perfect electrical and mechanical condition.
- Installers may only use single-conductor cable listed and labeled as PV wire which is 90°C wet rated in North America, and single conductor cable with a cross section area of at least 4mm² (12 AWG), 90°C wet rated in other areas (i.e. IEC 62930: 2017 approved), with proper insulation which is able to withstand the maximum possible system open-circuit voltage. Only copper conductor material should be used. Select a suitable conductor gauge to minimize voltage drop and ensure that the conductor ampacity complies with local regulations (i.e. NEC 690.8(D)).

CABLE AND CONNECTOR PROTECTION

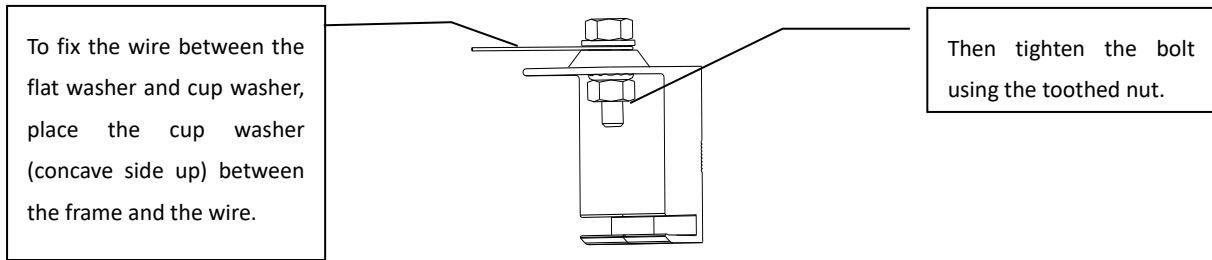
- Secure the cables to the mounting system using UV-resistant cable ties. Protect exposed cables from damage by taking appropriate precautions (e.g. placing them inside a metallic raceway like EMT conduit). Avoid exposure to direct sunlight.
- A minimum bending radius of 60 mm (2.36 in) is required when securing the junction box cables to the racking system.

- Protect exposed connectors from weathering damage by taking appropriate precautions. Avoid exposure to direct sunlight.
- Do not place connectors in locations where water could easily accumulate.

5.2 GROUNDING

- For grounding requirements in North America, a module with exposed conductive parts is considered to comply with UL61730 only when it is electrically grounded in accordance with both the instructions presented below and the requirements of the National Electrical Code. Any grounding means used with Canadian Solar modules should be NRTL certified to UL 467 and UL 2703 standards. Please consult our technical service team for the formal approval process.
- For grounding requirements in other areas, although the modules are certified to Safety Class II, we recommend them to be grounded and that module installation should comply with all applicable local electrical codes and regulations. Minimum size of equipment grounding conductors for ground raceway and equipment from NEC 690.8(D) should be considered. Grounding connections should be installed by a qualified electrician. Connect module frames together using adequate grounding cables: we recommend using 4-14 mm² (AWG 6-12) copper wire. Holes provided for this purpose are identified with a grounding symbol  (IEC 61730-1). All conductive connection junctions must be firmly fixed.
- Do not drill any extra ground holes for convenience as this will void the modules warranty.
- All bolts, nuts, flat washers, lock washers and other relevant hardware should be made of stainless steel, unless otherwise specified.
- Canadian Solar does not provide grounding hardware.
- The grounding method described below is recommended for Canadian Solar.

GROUNDING METHOD: BOLT + TOOTHED NUT + CUP WASHER.



- A grounding kit containing an M5 (3/16") SS cap bolt, an M5 (3/16") SS flat washer, an M5 (3/16") SS cup washer, and an M5 (3/16") SS nut (with teeth) is used to attach copper grounding wire to a pre-drilled grounding hole on the frame (see image above). The grounding holes are located at the upper and lower edges of the long side frame, close to the module short sides.
- Mounting rail designs should be such to allow easy access to the grounding holes located on the long side of the frame, in order to enable the equipment grounding function when required.
- Place the wire between the flat washer and the cup washer. Ensure that the cup washer is positioned between the frame and the wire with the concave side up to prevent galvanic corrosion. Tighten the bolt securely using the SS toothed nut. A wrench may be used to do this. The tightening torque is 3-7 Nm (2.2-5.2 ft-lbs).

6.0 MOUNTING INSTRUCTIONS



The applicable regulations pertaining to work safety, accident prevention and securing the construction site must be observed. Workers and third party personnel shall wear or install fall arrest equipment. Any third party need to be protected against injuries and damages.

- The mounting design must be certified by a registered professional engineer. The mounting design and procedures must comply with all applicable local codes and requirements from all relevant authorities.
- The loads described in this manual correspond to test loads. For installations complying with UL 61730 and IEC 61215-2:2016, a safety factor of 1.5 should be

applied for calculating the equivalent maximum authorized design loads. Project design loads depend on construction, applicable standards, location and local climate. Determination of the design loads is the responsibility of the racking suppliers and/or professional engineers. For detailed information, please follow local structural code or contact your professional structural engineer.

- Use appropriate corrosion-proof fastening materials. All mounting hardware (bolts, spring washers, flat washers, nuts) should be hot dip galvanized or stainless steel.
- Use a torque wrench for installation.
- Do not drill additional holes or modify the module frame. Doing so will void the warranty.

WHEN CLAMPS ARE USED AS FIXING MATERIAL

- Install and tighten the module clamps to the mounting rails using the torque stated by the mounting hardware manufacturer. System designer and installer are responsible for load calculations and for proper design of support structure. It is recommended to use a torque wrench for installation. Tightening torques must respectively be within 16–20 Nm (11.8–14.75 ft-lbs) for M8 x 1.25-Grade 8.8 (5/16"-18 Grade B7) galvanized or A2-70 stainless steel coarse thread bolts, depending on bolt class. The yield strength of bolt and nut should not be less than 450 MPa.
- Clamp material should be anodized aluminum alloy or steel of appropriate grade.
- Clamp positions are of crucial importance for the reliability of the installation, the clamp centerline must only be positioned within the authorized position

ranges indicated below, depending on the configuration and load.

6.1 MOUNTING METHODS FOR FRAMED BIFACIAL MODULE (Bolting)

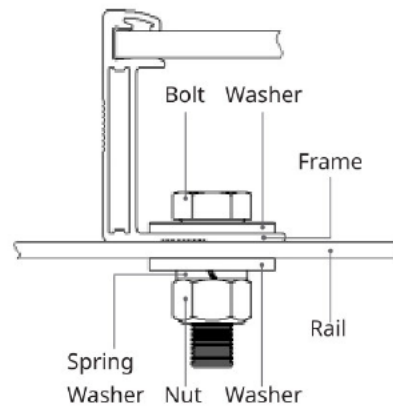
- The mechanical load test with these mounting methods were performed according to IEC 61215.
- Modules should be bolted to supporting structures through the mounting holes in the rear frame flanges only.
- Each module must be securely fastened at a minimum of 4 points on two opposite sides.
- M8 X 1.25 (5/16") bolt and nut should be used.
- Plain washer size should be M8 with outer diameter 16 mm.
- The yield strength of bolt and nut should not be less than 450MPa.

NOTICE Suitable bolt length should be chosen based on actual module frame height. For bifacial module with 30 mm frame height, our recommended maximum bolt length is 20 mm in order to properly insert the bolts through the mounting hole. The system designer is responsible to check that the racking supplier specified bolt length comply with above requirement and will not affect

installation.

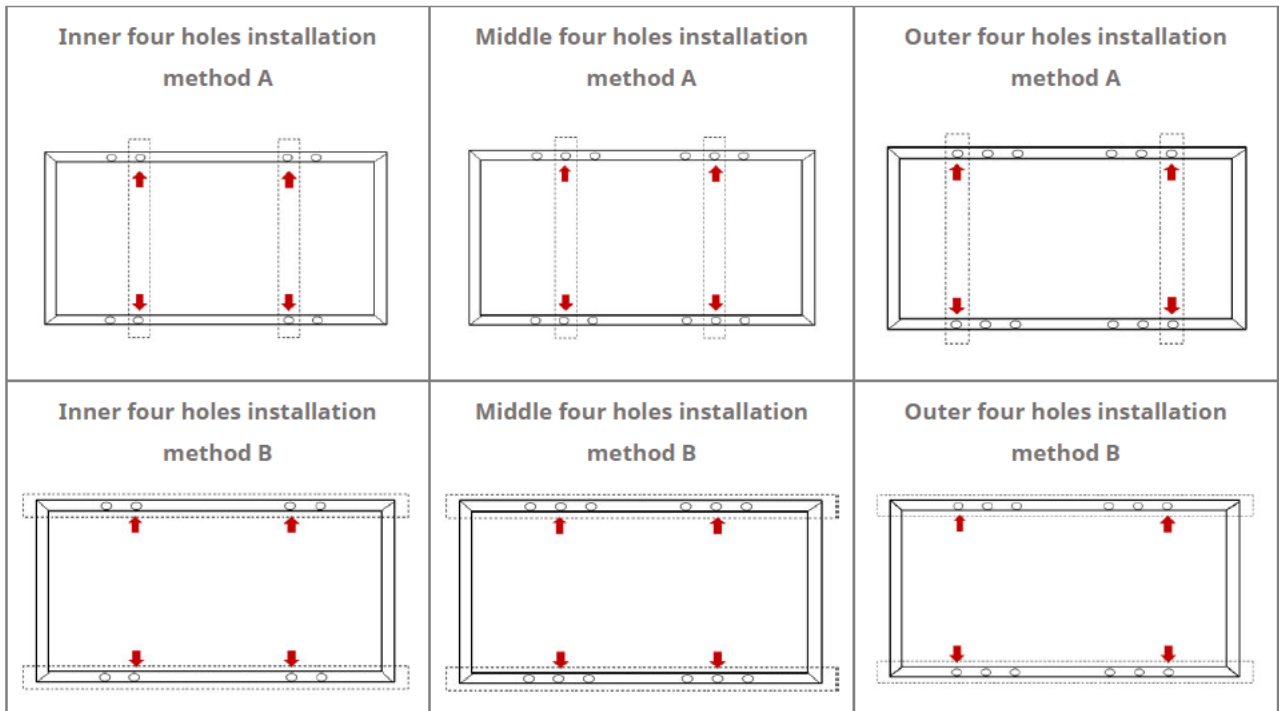
- Tightening torques should be within 16~20 Nm (11.8~14.75 ft-lbs) for M8 (5/16") coarse thread bolts, depending on bolt class.
- In areas with heavy wind loads, additional mounting points should be used. The system designer and the installer are responsible for correctly calculating the loads and ensuring that the supporting structure meets all the applicable requirements.

Mounting method: Bolting



- Modules should be bolted at the following hole locations depending on the configuration and loads:

Table 3: Approved bolting methods



Installation Method Module Types	Inner four holes installation method A	Inner four holes installation method B	Middle four holes installation method A	Middle four holes installation method B	Outer four holes installation method A	Outer four holes installation method B
CS3U/CS3W	/	/	+5400Pa/ -2400Pa	+3600Pa/ -2400Pa	/	/
CS3K	+5400Pa/ -2400Pa	+3600Pa/ -2400Pa	/	/	/	/
CS3Y	/	/	/	/	+5400Pa/ -2400Pa	+3600Pa/ -2400Pa
CS6W	/	/	/	/	+5400Pa/ -2400Pa	/
CS7N/CS7L	/	/	/	/	+5400Pa/ -2400Pa	+3600Pa/ -2400Pa

Note: The installation method of bolt is based on the experimental results, “/” means not tested.

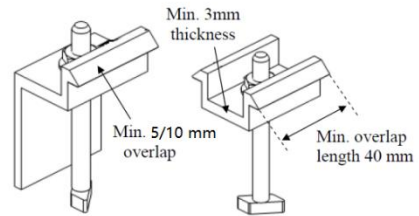
6.2 MOUNTING METHODS FOR FRAMED BIFACIAL MODULE (Clamping)

- The mechanical load test with these mounting methods were performed according to IEC 61215.
- Each module must be securely fastened at a minimum of four points on two opposite sides. The clamps should be positioned symmetrically. The clamps should be positioned according to the authorized position ranges defined in table below. Install and tighten the module clamps to the mounting rails using the torque stated by the mounting hardware manufacturer. M8 x 1.25 (5/16") bolt and nut are used for this clamping method. The yield strength of bolt and nut should not be less than 450 MPa.
- Tightening torques should be within 16~20 Nm (11.8~14.75 ft-lbs) for M8 (5/16"-18 Grade B7) coarse thread bolts, depending on the bolt class. For the bolt grade, the technical guideline from the fastener suppliers should be followed. Different recommendations from specific clamping hardware suppliers should prevail.
- The system designer and installer are responsible for load calculations and for proper design of support structure.
- The mounting rails shall be designed to limit as much as possible shade on module rear side cells.
- Canadian Solar's warranty may be void in cases where improper clamps or unsuitable installation methods are found. When installing inter-modules or end-type clamps, please take the following measures into account:

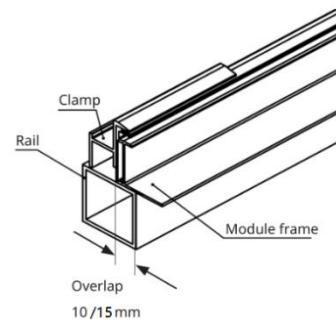
1. Do not bend the module frame.
2. Do not touch or cast shadows on the front glass.
3. Do not damage the surface of the frame (to the exception of the clamps with bonding pins).
4. Ensure the clamps overlap the module frame by at least 10 mm (0.4 in) for CS6W, CS7N, CS7L, and 5mm /0.2in) for others.
5. Overlap in length by at least

- a) 80 mm (3.15 in) when $2400 \text{ Pa} < \text{uplift load} \leq 4000 \text{ Pa}$ is required.
- b) 40 mm (1.57 in) when uplift load $\leq 2400 \text{ Pa}$ is required.

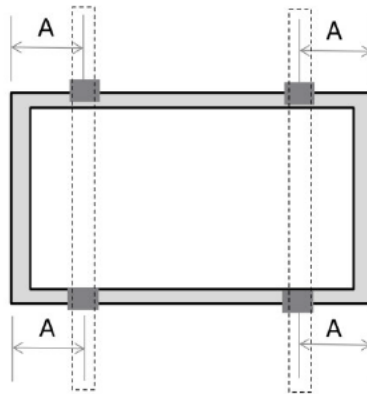
6. Ensure the clamp thickness is at least 3 mm (0.12 in).



- Clamp material should be anodized aluminum alloy or stainless steel.
- Clamp positions are of crucial importance for the reliability of the installation. The clamp centerlines must only be positioned within the ranges indicated in table below, depending on the configuration and load.
- For configurations where the mounting rails run parallel to the frame, precautions should be taken to ensure the bottom flange of the module frame overlaps the rail by at least 15 mm (0.59 in) for CS6W, CS7N, CS7L, and 10 mm (0.4 in) for other module series.

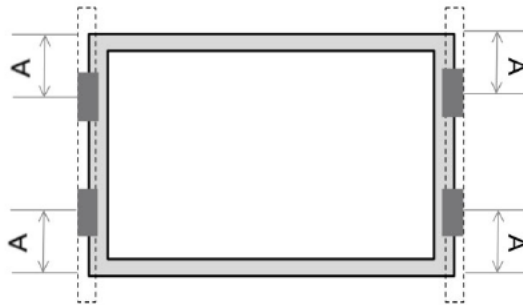


6.2.1 Clamp mounting on long side of frame and rails perpendicular to the long side frame



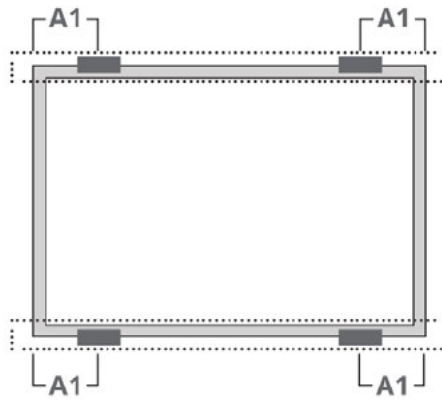
Module Types	Max Mechanical Load (Pa)		
	+3600/-2400	+5400/-2400	+5400/-3600
	A Range (mm)		
CS3K	/	/	270-380
CS3U	/	/	410-490
CS3W	/	/	410-490
CS3Y	300-600	/	400-550
CS6W	300-600	400-500	/
CS7N/CS7L	/	400-500	/

6.2.2 Clamp mounting on short side of frame and rails perpendicular to the long side frame.



Module Types	A Range (mm)	
	0-200	200-250
	Max Mechanical Load (Pa)	
CS3K	+2200/-1800	+2400/-2000
CS3U/CS3W	+800/-800	+1000/-1000

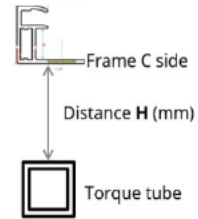
6.2.3 Clamp mounting on long side of frame and rails parallel to the long side frame.



Module Types	Max Mechanical Load (Pa)				
	+3600/-2400	+3800/-3200	+4000/-3200	+4400/-3200	+4400/-3600
	A1 Range (mm)				
CS3K	/	270-380	/	/	/
CS3U	/	410-490	/	/	/
CS3W	/	/	/	/	410-490
CS3Y	/	/	/	400-550	/
CS6W	/	/	400-500	/	/
CS7N/CS7L	400-500	/	/	/	/

6.3 MOUNTING METHODS FOR FRAMED BIFACIAL MODULE (SINGLE-AXIS TRACKER)

- The bolts and clamps used in this section should follow the requirements in 6.1 and 6.2.
- Under any conditions the junction box should not become in contact with the subjacent racking structure except torque tube. If any racking structures, especially bearing house, have to be located under the modules, the distance H between the frame and the racking structure should be at least 40mm.



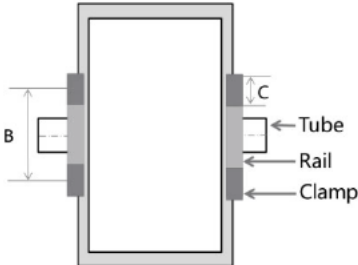
- If your tracker design cannot meet the above distance requirement, please contact Canadian Solar technical support department in writing for advice.

Tracker 1P Bolting method

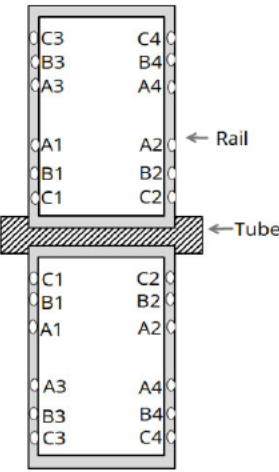
- Install and tighten the module clamps to the mounting rails using the torque stated by the mounting hardware manufacturer. M6 X 1 (1/4") bolt and nut are used for this bolting method.
- Tightening torques should be 6~9 Nm (4.5~6.6 ft-lbs) M6 X 1 (1/4") coarse thread bolts, depending on bolt class.

	Module type	Mounting hole space (mm)	Fixed mounting hole location	Plain washer outer diameter (mm)	Distance H (mm)	Test load (Pa)
	CS3W-PB-AG	A1-A3: 400	A1, A2, A3, A4	16	<80	+2400/-2400
	CS3W-MB-AG	B1-B3: 1155	A1, A2, A3, A4 B1, B2, B3, B4	16	≥80	+3000/-2800
	CS3Y-PB-AG	A1-A3: 400	A1, A2, A3, A4	16	<80	+2400/-2200
	CS3Y-MB-AG	B1-B3: 790	A1, A2, A3, A4 B1, B2, B3, B4	16	≥80	+2800/-2800
	CS6W-MB-AG	A1-A3: 400 B1-B3: 790	A1, A2, A3, A4	16	<80	+2000/-1800
			B1, B2, B3, B4	16	≥80	+2400/-2200
	CS7L-MB-AG	A1-A3: 400	A1, A2, A3, A4	16	<80	+2400/-2100
			B1, B2, B3, B4	16	≥80	+2800/-2100
	CS7N-MB-AG	B1-B3: 790	A1, A2, A3, A4	16	<80	+2400/-2100
			B1, B2, B3, B4	16	≥80	+2600/-2100

Tracker 1P Clamping method

 <p>Overlap width between clamp and frame: Frame top side ≥ 10mm Frame bottom side ≥ 15mm</p>	Module type	B Value (mm)	Clamp length C (mm)	Test load (Pa)
	CS3W-PB-AG CS3W-MB-AG	≥400	≥40	+2400/-1800
≥80			+2400/-2400	
CS3Y-MB-AG CS3Y-PB-AG CS6W-MB-AG	≥400 ≥600	≥40	+1800/-1800	
		≥80	+2400/-2400	
CS7L-MB	≥400 ≥600	≥40	+2100/-2100	
		≥80	+2400/-2400	
CS7N-MB	≥400 ≥600	≥40	+1800/-1800	
		≥80	+2100/-2100	

Tracker 2P Bolting method

	Module type	Mounting hole space (mm)	Mounting hole location	Plain washer outer diameter (mm)	Test load (Pa)
	CS3W-PB-AG CS3W-MB-AG	A1-A3: 400 B1-B3: 1155	B1, B2, A3, A4	B1, B2, A3, A4	16
B1, B2, B3, B4				16	+2200/-2000
CS3Y-MB-AG CS3Y-PB-AG CS6W-MB-AG CS7L-MB-AG CS7N-MB-AG	A1-A3: 400 B1-B3: 790	B1, B2, A3, A4	B1, B2, A3, A4	16	+1800/-1600
			B1, B2, B3, B4	16	+2200/-2000

- The allowable maximum twist angle of the module is 0.5 degree.
- Please contact the tracker manufacturer and Canadian Solar’s technical support department for details in regard to specific projects.

7.0 MAINTENANCE

- **Do not** make modifications to any component of the PV module (diode, junction box, connectors or others).
- Regular maintenance is required to keep modules clear of snow, bird droppings, seeds, pollen, leaves, branches, dirt spots, and dust.
- Modules with sufficient tilt (at least 15°), generally may not require cleaning (rain will have a self-cleaning effect). If the module has become soiled, wash with water and a non-abrasive cleaning implement (sponge) during the cool part of the day. Do not scrape or rub dry dirt away, as this may cause micro scratches.
- Snow should be removed using a soft brush.
- Periodically inspect the system to check the integrity of all wiring and supports.
- To protect against electric shock or injury, electrical or mechanical inspections and maintenance should be performed by qualified personnel only.

8.0 Module Cleaning Guidelines

This manual covers the requirements for the cleaning procedure of Canadian Solar's photovoltaic modules. The purpose of these cleaning guidelines is to provide general information for cleaning Canadian Solar modules. System users and professional installers should read these guidelines carefully and strictly follow these instructions.

Failure to follow these instructions may result in death, injury or damage to the photovoltaic modules. Damages induced by inappropriate cleaning procedures will void Canadian Solar warranty.



SAFETY WARNING

- Cleaning activities create risk of damaging the modules and array components, as well as increasing the potential electric shock hazard.
- Cracked or broken modules represent an electric shock hazard due to leakage currents, and the risk of shock is increased when modules are wet. Before cleaning, thoroughly inspect modules for cracks, damage, and

loose connections.

- The voltage and current present in an array during daylight hours are sufficient to cause a lethal electrical shock.
- Ensure that the circuit is disconnected before starting the cleaning procedure as contact with leakage of electrically active parts can result in injury.
- Ensure that the array has been disconnected to other active components (such as inverter or combiner boxes) before starting with the cleaning.
- Wear suitable protection (clothes, insulated gloves, etc.).
- **Do not** immerse the module, partially or totally, in water or any other cleaning solution.
- Rear side cleaning of the modules is not required, if cleaning the rear of a module is desired, care should be taken to ensure there is no damage caused to the module by simply clearing the growth by hand or with a soft sponge.

HANDLING NOTICE

NOTICE

- Use a proper cleaning solution and suitable cleaning equipment.
- **Do not** use abrasive or electric cleaners on the module.
- Particular attention should be taken to avoid the module rear glass or frame to come in contact with sharp objects, as scratches may directly affect product safety.
- **Do not** use abrasive cleaners, de-greasers or any unauthorized chemical substance (e.g. oil, lubricant, pesticide, etc.) on the module.
- **Do not** use cleaning corrosive solutions containing hydrofluoric acid, alkali, acetone, or industrial alcohol. Only substances explicitly approved by Canadian Solar are allowed to be used for cleaning modules.
- For cleaning methods using rotating brush, please consult with Canadian Solar's technical support before using.

- Dirt must never be scraped or rubbed away when dry, as this will cause micro-scratches on the glass surface.

OPERATION PREPARATION

- Noticeable dirt must be rubbed away by gentle cleaning implement (soft cloth, sponge or brush with soft bristles).
- Ensure that brushes or agitating tools are not abrasive to glass, EPDM, silicone, aluminum, or steel.
- Conduct the cleaning activities avoiding the hottest hours of the day, in order to avoid thermal stress on the module.

Canadian Solar recommends the use of:

- Water with low mineral content
- Near neutral pH water
- The maximum water pressure recommended is 4 MPa (40 bar)

CLEANING METHODS

Method A: Compressed Air

Canadian Solar recommends cleaning the soft dirt (like dust) on modules just with air pressure. This technique can be applied as long as the method is efficient enough considering the existing conditions.

Method B: Wet cleaning

If excessive soiling is present on the module surface, a non-conductive brush, sponge, or other mild agitating method may be used with caution.

- Ensure that any brushes or agitating tools are constructed with non-conductive materials to minimize risk of electric shock and that they are not abrasive to the glass or the aluminum frame.
- If grease is present, an environmental friendly cleaning agent may be used with caution.

ANNEX A: MECHANICAL AND ELECTRICAL RATINGS

Standard Test Conditions are: Irradiance of 1000 W/m², AM1.5 spectrum, and cell temperature of 25°C. The tolerance of electrical characteristics is respectively within ±3% for Pmax, and ±5% for Isc & Voc. Specifications are subject to change without notice.

Table A: Mechanical and electrical ratings under STC

Model Type	Maximum power Pmax <W>	Operating voltage Vmp <V>	Operating current Imp <A>	Open Circuit Voltage Voc <V>	Short Circuit Current Isc <A>	Max. Series Fuse Rating <A>	Overall Dimension <mm>	Weight <Kg>
CS3U-350MB-AG	350	38.8	9.03	46.6	9.53	25	2022 x 992 x 30 (79.6 x 39.1 x 1.18 in)	25.7 (56.7 lbs)
CS3U-355MB-AG	355	39.0	9.11	46.8	9.61	25		
CS3U-360MB-AG	360	39.2	9.19	47.0	9.69	25		
CS3U-365MB-AG	365	39.4	9.27	47.2	9.77	25		
CS3U-370MB-AG	370	39.6	9.35	47.4	9.85	25		
CS3U-375MB-AG	375	39.8	9.43	47.6	9.93	25		
CS3U-380MB-AG	380	40.0	9.50	47.8	10.01	25		
CS3U-385MB-AG	385	40.2	9.58	48.0	10.09	25		
CS3U-390MB-AG	390	40.4	9.66	48.2	10.17	25		
CS3U-395MB-AG	395	40.6	9.73	48.4	10.25	25		
CS3U-400MB-AG	400	40.8	9.81	48.6	10.33	25		
CS3U-405MB-AG	405	41.0	9.88	49.3	10.44	25		
CS3U-410MB-AG	410	41.2	9.96	49.5	10.52	25		
CS3K-280MB-AG	280	31.7	8.84	38.5	9.49	25	1696 x 992 x 30 (66.8 x 39.1 x 1.18 in)	22.1 (48.7 lbs)
CS3K-285MB-AG	285	31.9	8.94	38.7	9.57	25		
CS3K-290MB-AG	290	32.1	9.04	38.9	9.65	25		
CS3K-295MB-AG	295	32.3	9.14	39.1	9.73	25		
CS3K-300MB-AG	300	32.5	9.24	39.3	9.82	25		
CS3K-305MB-AG	305	32.7	9.33	39.5	9.90	25		
CS3K-310MB-AG	310	32.9	9.43	39.7	9.98	25		
CS3K-315MB-AG	315	33.1	9.52	39.9	10.06	25		
CS3K-320MB-AG	320	33.3	9.61	40.1	10.14	25		
CS3K-325MB-AG	325	33.5	9.71	40.3	10.22	25		
CS3K-330MB-AG	330	33.7	9.80	40.5	10.30	25		
CS3U-350PB-AG	350	39.2	8.94	46.6	9.51	25	2022 x 992 x 30 (79.6 x 39.1 x 1.18 in)	25.7 (56.7 lbs)
CS3U-355PB-AG	355	39.4	9.02	46.8	9.59	25		
CS3U-360PB-AG	360	39.6	9.10	47.0	9.67	25		
CS3U-365PB-AG	365	39.8	9.18	47.2	9.75	25		
CS3U-370PB-AG	370	40.0	9.26	47.4	9.83	25		
CS3U-375PB-AG	375	40.2	9.34	47.6	9.91	25		

Model Type	Maximum power Pmax <W>	Operating voltage Vmp <V>	Operating current Imp <A>	Open Circuit Voltage Voc <V>	Short Circuit Current Isc <A>	Max. Series Fuse Rating <A>	Overall Dimension <mm>	Weight <Kg>
CS3U-380PB-AG	380	40.4	9.42	47.8	9.99	25		
CS3U-385PB-AG	385	40.6	9.50	48.0	10.07	25		
CS3U-390PB-AG	390	40.8	9.56	48.6	10.17	25		
CS3U-395PB-AG	395	41.0	9.64	48.8	10.24	25		
CS3U-400PB-AG	400	41.2	9.71	49.0	10.30	25		
CS3U-405PB-AG	405	41.4	9.79	49.2	10.37	25		
CS3U-410PB-AG	410	41.6	9.86	49.4	10.43	25		
CS3U-415PB-AG	415	41.8	9.93	49.6	10.49	25		
CS3U-420PB-AG	420	42.0	10.00	49.8	10.55	25		
CS3K-265PB- AG	265	30.6	8.66	37.3	9.22	25	1696 x 992 x 30 (66.8 x 39.1 x 1.18 in)	22.1 (48.7 lbs)
CS3K-270PB- AG	270	30.8	8.77	37.5	9.30	25		
CS3K-275PB- AG	275	31.0	8.88	37.7	9.38	25		
CS3K-280PB- AG	280	31.2	8.98	37.9	9.47	25		
CS3K-285PB- AG	285	31.4	9.08	38.1	9.56	25		
CS3K-290PB- AG	290	32.3	8.98	38.9	9.49	25		
CS3K-295PB- AG	295	32.5	9.08	39.1	9.57	25		
CS3K-300PB- AG	300	32.7	9.18	39.3	9.65	25		
CS3K-305PB- AG	305	32.9	9.28	39.5	9.73	25		
CS3K-310PB- AG	310	33.1	9.37	39.7	9.81	25		
CS3K-315PB- AG	315	33.3	9.46	39.9	9.89	25		
CS3K-320PB- AG	320	33.5	9.56	40.1	9.97	25		
CS3K-325PB- AG	325	33.7	9.65	40.9	10.21	25		
CS3K-330PB- AG	330	33.9	9.74	41.1	10.29	25		
CS3K-335PB- AG	335	34.1	9.83	41.3	10.37	25		
CS3K-340PB-AG	340	34.3	9.92	41.5	10.45	25		
CS3K-345PB-AG	345	34.5	10.00	41.7	10.52	25		
CS3K-350PB-AG	350	34.7	10.09	41.9	10.60	25		
CS3W-380PB-AG	380	37.9	10.03	46.4	10.58	25	2132 x 1048 x 30 (83.9 x 41.3 x 1.18 in)	28.2 (62.2 lbs)
CS3W-385PB-AG	385	38.1	10.11	46.6	10.66	25		
CS3W-390PB-AG	390	38.3	10.19	46.8	10.74	25		
CS3W-395PB-AG	395	38.5	10.26	47.0	10.82	25		
CS3W-400PB-AG	400	38.7	10.34	47.2	10.9	25		
CS3W-405PB-AG	405	38.9	10.42	47.4	10.98	25		
CS3W-410PB-AG	410	39.1	10.49	47.6	11.06	25		
CS3W-415PB-AG	415	39.3	10.56	47.8	11.14	25		
CS3W-420PB-AG	420	39.5	10.64	48.0	11.26	25		

Model Type	Maximum power Pmax <W>	Operating voltage Vmp <V>	Operating current Imp <A>	Open Circuit Voltage Voc <V>	Short Circuit Current Isc <A>	Max. Series Fuse Rating <A>	Overall Dimension <mm>	Weight <Kg>
CS3W-425PB-AG	425	39.7	10.71	48.2	11.29	25		
CS3W-430PB-AG	430	39.9	10.78	48.4	11.32	25		
CS3W-435PB-AG	435	40.1	10.85	48.6	11.35	25		
CS3W-440PB-AG	440	40.3	10.92	48.7	11.40	25		
CS3W-445PB-AG	445	40.5	10.99	48.8	11.45	25		
CS3W-415MB-AG	415	39.7	10.46	47.7	11.22	25	2132 x 1048 x 30 (83.9 x 41.3 x 1.18 in)	28.4 (62.6 lbs)
CS3W-420MB-AG	420	39.9	10.53	47.9	11.27	25		
CS3W-425MB-AG	425	40.1	10.60	48.1	11.32	25		
CS3W-430MB-AG	430	40.3	10.68	48.3	11.37	25		
CS3W-435MB-AG	435	40.5	10.75	48.5	11.42	25		
CS3W-440MB-AG	440	40.7	10.82	48.7	11.48	25		
CS3W-445MB-AG	445	40.9	10.89	48.9	11.54	25		
CS3W-450MB-AG	450	41.1	10.96	49.1	11.60	25		
CS3W-455MB-AG	455	41.3	11.02	49.3	11.66	25		
CS3W-460MB-AG	460	41.5	11.09	49.5	11.72	25		
CS3W-465MB-AG	465	41.7	11.16	49.7	11.78	25		
CS3Y-465MB-AG	465	43.6	10.67	52.3	11.42	25		
CS3Y-470MB-AG	470	43.8	10.74	52.5	11.47	25		
CS3Y-475MB-AG	475	44.0	10.81	52.7	11.52	25		
CS3Y-480MB-AG	480	44.2	10.87	52.9	11.57	25		
CS3Y-485MB-AG	485	44.4	10.94	53.1	11.62	25		
CS3Y-490MB-AG	490	44.6	11.00	53.3	11.67	25	2260 x 1048 x 32 (89.0 x 41.3 x 1.26 in)	29.9 (65.9 lbs)
CS3Y-430PB-AG	430	41.6	10.34	50.8	11.08	25		
CS3Y-435PB-AG	435	41.8	10.41	51.0	11.13	25		
CS3Y-440PB-AG	440	42.0	10.48	51.2	11.18	25		
CS3Y-445PB-AG	445	42.2	10.55	51.4	11.23	25		
CS3Y-450PB-AG	450	42.4	10.62	51.6	11.28	25		
CS3Y-455PB-AG	455	42.6	10.69	51.8	11.33	25		
CS3Y-460PB-AG	460	42.8	10.75	52.0	11.38	25		
CS3Y-465PB-AG	465	43.0	10.82	52.2	11.43	25		
CS3Y-470PB-AG	470	43.2	10.88	52.4	11.48	25		
CS3Y-475PB-AG	475	43.4	10.95	52.6	11.53	25		
CS6W-510MB-AG	510	40.1	12.72	48.0	13.60	30	2266 x 1134 x 35 (89.2 x 44.6 x 1.38 in)	32.3 (71.0 lbs)
CS6W-515MB-AG	515	40.3	12.78	48.2	13.65	30		
CS6W-520MB-AG	520	40.5	12.84	48.4	13.70	30		
CS6W-525MB-AG	525	40.7	12.90	48.6	13.75	30		

Model Type	Maximum power Pmax <W>	Operating voltage Vmp <V>	Operating current Imp <A>	Open Circuit Voltage Voc <V>	Short Circuit Current Isc <A>	Max. Series Fuse Rating <A>	Overall Dimension <mm>	Weight <Kg>
CS6W-530MB-AG	530	40.9	12.96	48.8	13.80	30		
CS6W-535MB-AG	535	41.1	13.02	49.0	13.85	30		
CS6W-540MB-AG	540	41.3	13.08	49.2	13.90	30		
CS6W-545MB-AG	545	41.5	13.14	49.4	13.95	30		
CS6W-550MB-AG	550	41.7	13.20	49.6	14.00	30		
CS6W-555MB-AG	555	41.9	13.25	49.8	14.05	30		
CS7L-570MB-AG	570	33.7	16.93	40.1	18.17	35	2172 x 1303 x 35 (85.5 x 51.3 x 1.38 in)	34.6 (76.3 lbs)
CS7L-575MB-AG	575	33.9	16.97	40.3	18.22	35		
CS7L-580MB-AG	580	34.1	17.02	40.5	18.27	35		
CS7L-585MB-AG	585	34.3	17.06	40.7	18.32	35		
CS7L-590MB-AG	590	34.5	17.11	40.9	18.37	35		
CS7L-595MB-AG	595	34.7	17.15	41.1	18.42	35		
CS7L-600MB-AG	600	34.9	17.20	41.3	18.47	35		
CS7L-605MB-AG	605	35.1	17.25	41.5	18.52	35		
CS7L-610MB-AG	610	35.3	17.29	41.7	18.57	35		
CS7N-630MB-AG	630	37.1	16.99	44.2	18.23	35	2384 x 1303 x 35 (93.9 x 51.3 x 1.38 in)	37.9 (83.6 lbs)
CS7N-635MB-AG	635	37.3	17.03	44.4	18.27	35		
CS7N-640MB-AG	640	37.5	17.07	44.6	18.31	35		
CS7N-645MB-AG	645	37.7	17.11	44.8	18.35	35		
CS7N-650MB-AG	650	37.9	17.16	45.0	18.39	35		
CS7N-655MB-AG	655	38.1	17.20	45.2	18.43	35		
CS7N-660MB-AG	660	38.3	17.24	45.4	18.47	35		
CS7N-665MB-AG	665	38.5	17.28	45.6	18.51	35		
CS7N-670MB-AG	670	38.7	17.32	45.8	18.55	35		

AMENDED EDITIONS AND DATES

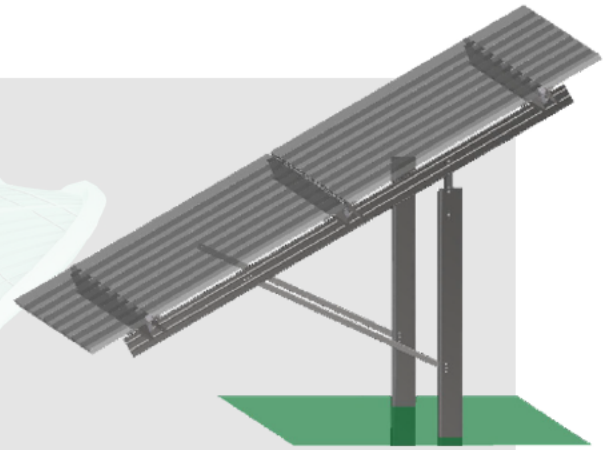
- Rev 1.2 is released in June, 2019.
- Rev 1.21 is released in July, 2019.
- Rev 1.3 is released in September, 2019.
- Rev 1.4 is released in December, 2019.
- Rev 1.4 is released in December, 2019.
- Rev 1.5 is released in April, 2020.
- Rev 1.6 is released in May, 2020.
- Rev 1.7 is released in December, 2020.
- Rev 1.71 is released in December, 2020.
- Rev 1.8 is released in March, 2021.
- Rev 1.9 is released in June, 2021.
- Rev 1.91 is released in June, 2021.

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G-Max



- ▶ **Innovative fixed-tilt ground mount system**
- ▶ **Certified to LTR AE-001**
- ▶ **Four major components: post, girder assembly, purlin, and splice (as needed)**
- ▶ **25% increase in girder strength***
- ▶ **40% increase in purlin spans***
- ▶ **Standardized hardware, reduces installation time**



Unlike any steel PV mounting system on the market, the **G-Max** design is a direct result of customer and installer feedback, combined with years of engineering and manufacturing experience. G-Max pulls from Schletter’s legacy FS System for unbeatable ease-of-assembly and applies that concept to a steel system. The G-Max design principals include; increased adjustment capability, larger spans between foundations, and hardware standardization to reduce the number of part variables.

Reduction of Piles Means Reduction of Costs

Based on initial findings, the average utility- scale layout will experience a pile (foundation) quantity reduction of 20% and capture the following cost efficiencies:

- Reduced manufacturing time/cost savings
- Reduced freight time, weight/cost savings
- Site deployment time/cost savings
- Installation time/cost savings

Factory Pre-Assembly

In order to speed installation time in the field, Schletter pre-assembles 30% of the G-Max components in-house. Benefits include:

- Fewer touch points in the field reduces install time, saving installation costs
- Less loose hardware in field reduces material loss on site
- Partially pre-assembled support kits
- Ease-of-assembly
- Optimum price: performance ratio
- Attractive design



Girder Assembly: Factory pre-assembled to unfold in field for incredible ease-of-assembly, reducing touch points, increasing assembly speed



Factory pre-assembled purlin mounting clips, reduces touch points in the field, installation time, and margin of error

Combined Purlin Design

A major design feature integrated into G-Max is a reduction of purlins required to secure PV modules. Traditional mounting systems use four purlins, while G-Max requires only three without the need for additional cross bracing or cross rails. The result is a reduction of material handling by 25%, increase in spans, reduction of foundations (piles), and consequently lower project installation costs.

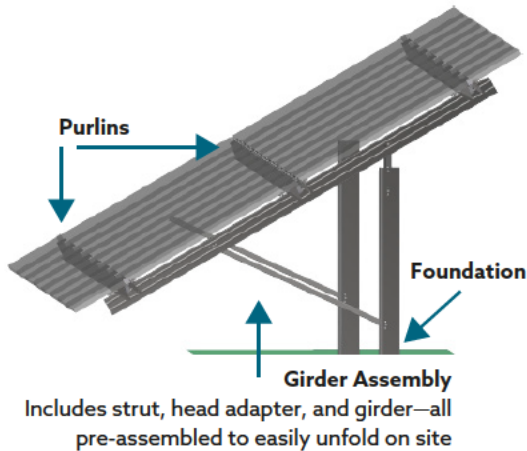
¹Grounding & Bonding (UL 2703), identified with ETL Listed Mark and tested with specific modules. See G-Max installation manual for complete list. See Intertek© ETL Listed Directory for more information.

* Compared to previous steel products offered by Schletter.

Intuitive Design Features

Through the years, Schletter has taken customer and installer feedback seriously. Within the G-Max design are visual quality assurance measures incorporated during manufacturing into the system. What this means for our customers is:

- Part identification numbers on every major component to clearly identify the part and the location for installation
- Embedment depth call-out (score line) on piles—provides a clear visual quality control indicator, increasing installation efficiency and reducing margin of error
- Torque check clips provides a simplified visual quality control check during installation reducing the need for manual torque checks



Safety and Ergonomic Improvements

It is well known that falls from elevated surfaces, such as from ladders, are one of the leading causes of occupational fatalities and injuries (OSHA). Schletter has designed the G-Max system to allow the option of module installation either from the top-down or bottom-up, reducing the necessity for ladders or scaffolding, and thereby reducing the likelihood of injuries during installation.

TECHNICAL DATA

Foundation Options (Current)	Hat channel: Galvanized steel, G210 coating, ASTM A653
Fixed Tilt Angles	10 – 35 °
Purlin and Mounting Superstructure	Galvanized steel, ASTM A653
Module Layout	Portrait
Module Compatibility	See installation manual for approved module list for UL Ed.1 requirements
Cable Management	Purlin integrated component materials available
Structural Design Standards	IBC 2006, 2009, 2012, or 2015 (ASCE 7-05, ASCE 7-10) with local amendments National Building Code of Canada compliant; PE Wet Stamps available
Testing and Certifications	Wind Tunnel, Validation Conforms to UL 2703 (pending), Certified to ULC/ORD STD C1703 (pending)
Warranty	20 year standard limited manufacturer warranty
Country of Manufacture	United States of America

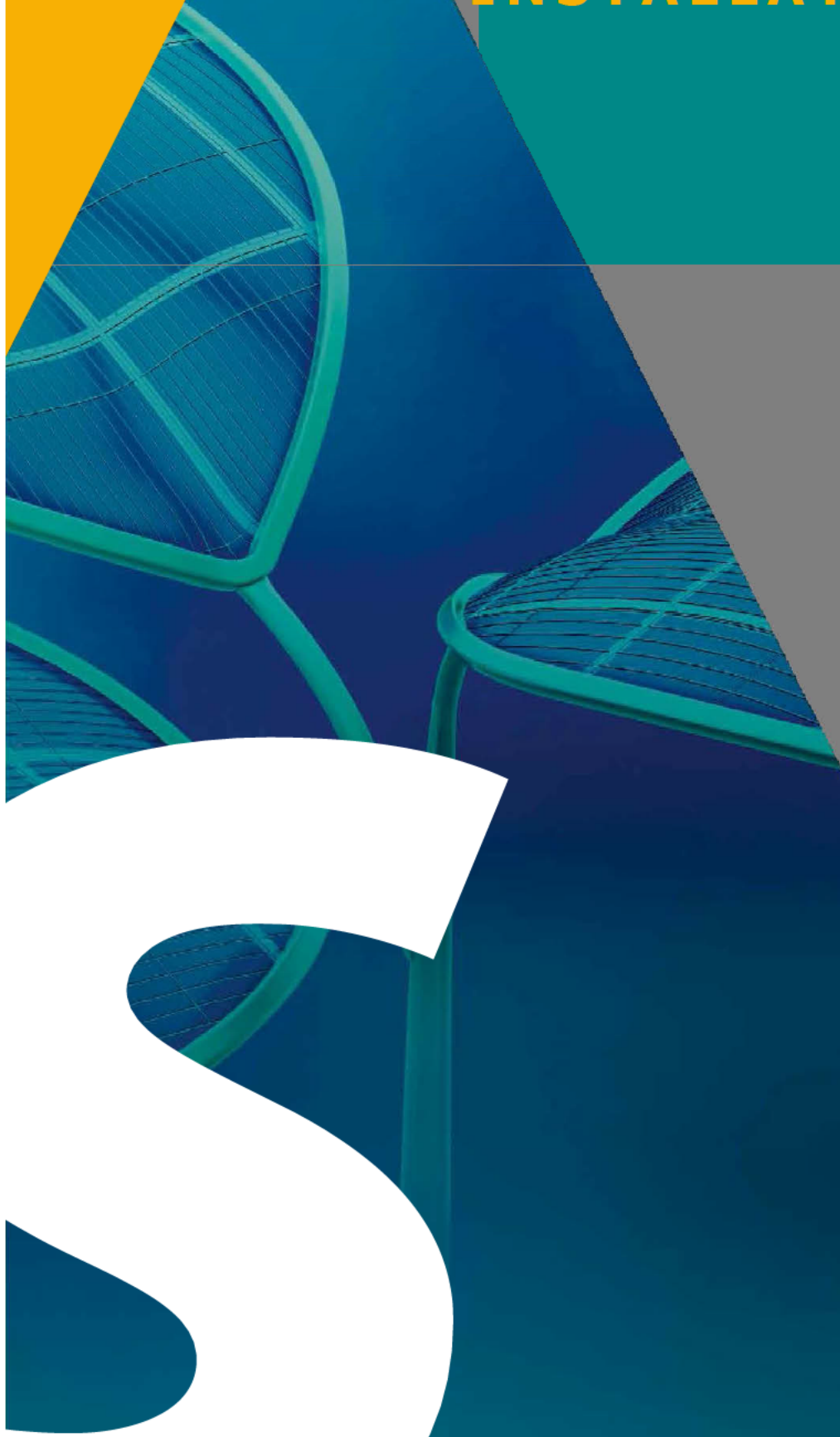


For more information, visit www.schletter-group.com or send us an email to fixedtiltNA@schletter-group.com.

G-MAX™

REDACTED – Matter No. 21-00750

GROUND MOUNT INSTALLATION MANUAL



G-MAX FEATURES

The Schletter G-Max solar mounting system for ground mount photovoltaic (PV) installation is specifically designed to meet or exceed applicable IBC, ASCE, and UL standards.

G-Max Features

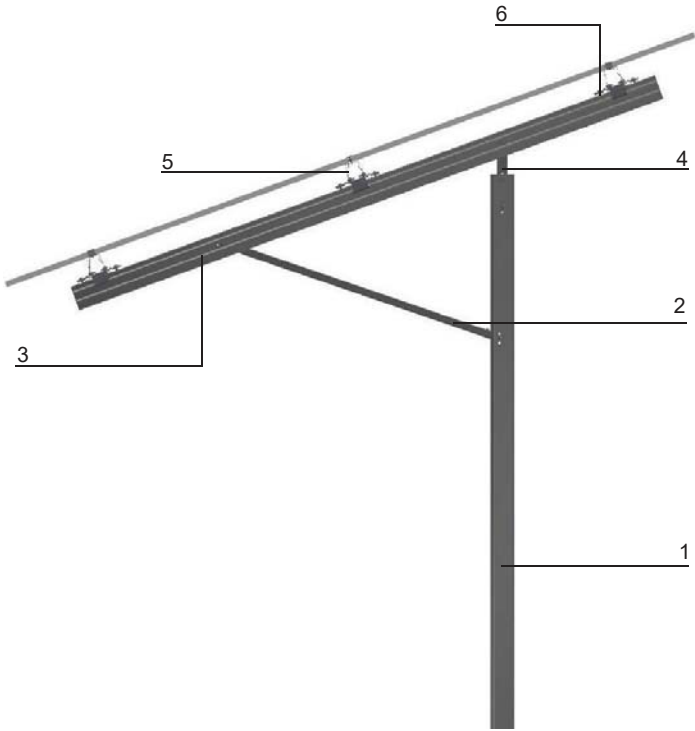
- Conforms to UL 2703¹ and ULC/ORD StdC1703
- Certified to LTR AE-001
- Electrically bonded unit
- 30 Amp fuse series rating
- Pre-assembled components
- Fully integrated and modular components
- Includes grounding module clamps

The G-Max is capable of accommodating nearly any framed PV module in portrait orientation.² Each G-Max is custom designed to meet specific structural load requirements.³ Included in G-Max are clamps specifically designed to secure and bond frame of a PV module.⁴ In turn, the components and assemblies that comprise G-Max form an electrically bonded unit. While individual components and structural sections will vary between designs, the primary assemblies and installation methods will remain the same. During installation, fully assemble system before securing bolts to the final torque.⁵ The following is a guide to properly install a G-Max in order to meet design and test standards.⁶

Key Components

1. Post
 2. Strut*
 3. Girder*
 4. Head*
 5. Purlin
 6. Module Clamp
-  Pre-assembled girder assembly

*Strut, girder, and head make-up pre-assembled girder assembly



¹The G-Max is evaluated for electrical bonding only. G-Max meets all IBC and ASCE requirements for structural loading; it was not evaluated for loading under UL 2703. G-Max is not to be used in corrosive atmospheres.

² Maximum number of modules shall not exceed maximum system voltage.

³ Individual parts and components will vary from system-to-system. Please reference system specific drawings.

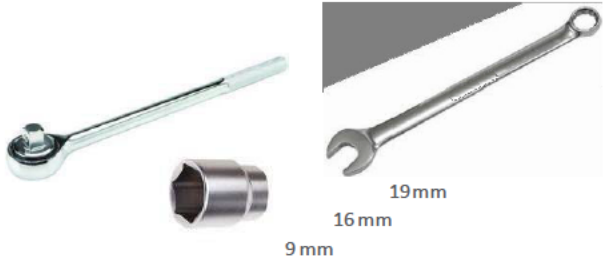
⁴This mounting system may be used to ground and/or mount a PV module complying with UL1703 only when specific module has been evaluated for grounding and/or mounting in compliance with included manual.

⁵Project drawings supersede installation instructions; see project drawings for all measurements, torques, and tolerances.

⁶Installer is responsible for verifying that system meets applicable NEC and CSA standards.

INSTALLATION TOOL LIST

- String line with wood line blocks for foundation post installation and purlin alignment
- Permanent marker
- Tape measure
- Two (2) foot carpenter’s square for girder-to-purlin connection
- Bubble level
- A 9 mm, 16 mm, and 19 mm wrench and/or socket is required for all bolted connections
- Torque wrench and Socket Extension
 - A 9 mm deep socket is required for module installation using an M8 bolted connection or bottom-up clamp.
 - 16 mm wrench and/or deep socket is required for all flanged M12 bolted connections at purlin clamps.
 - 19 mm wrench and or deep socket required for all non-flanged M12 bolted connections at posts and purlin splice
- Ratchet and/or rechargeable power drill with controlled speeds
- Torx® bit (TX40) for Rapid16™ module clamps



CONFIGURATION OPTIONS

G-Max Configuration Options

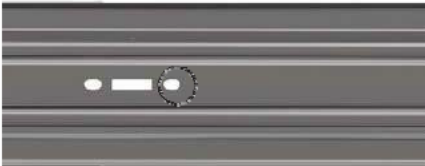
The G-Max Ground Mount System can be configured in a variety of ways based on project requirements. Below are some of the most common configurations and site designations.

- Direct Bolt Connection (Figure 1)
- **Rapid16** clamps (Figure 2)
- Bottom Up Clamp (Figure 3)

Figure 1a. — Direct Bolt



Figure 1b. — Direct Bolt



Note:
 First Solar Module — see supplement for detailed information.

Direct bolt connection using bolts on first and third purlins and Schletter's Rapid16 clamp on the middle purlin


Purlin includes small slots for direct bolt connection (shown as )

Figure 2a. — Rapid16 Clamp
 (available in 50 or 100mm lengths)

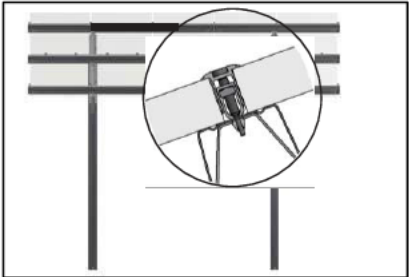
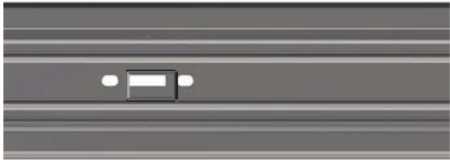



Figure 2b. — Rapid16 Clamp
 (available in 50 or 100mm lengths)



Purlin includes long slots for Rapid16 clamp connection (shown as )

Rapid16 clamp may be used to install all modules

FOUNDATION POST INSTALLATION

1. Survey proposed site:

- Review final drawing. Drawing will include information vital to proper installation of foundation posts.
- Refer to project drawing for tolerances for:
 - Embedment depth (Figure 6)
 - Support distance (Figure 7)
 - Lateral cantilever (Figure 7)
 - Post height variation (Figure 8)
 - Post verticality (Figure 9)
 - Post rotation (Figure 10)
- For longer racks, intermediate stakes may be required.
- Posts are installed vertically.
- For East-West slopes greater than 5.7° (10% slope) (Figure 11), contact your Schletter representative to discuss custom rack options. Racks can be designed for slopes up to 40° (84% slope).



Note:
For G-Max Duo post, please see the supplemental instructions for additional installation instructions.

Figure 6

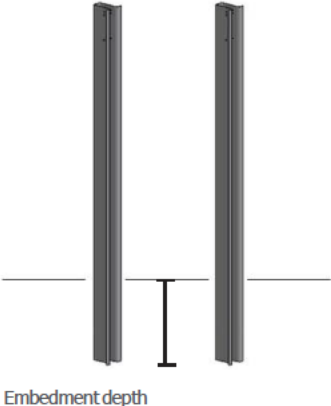


Figure 7

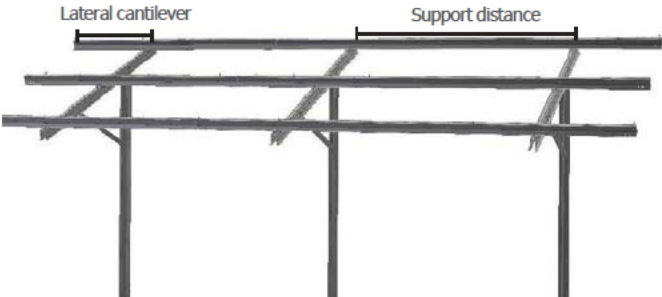


Figure 8

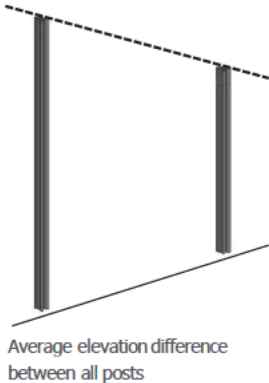


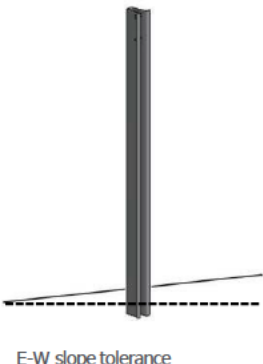
Figure 9



Figure 10



Figure 11



FOUNDATION POST INSTALLATION

1. Post installation

- Position each post at respective installation locations based on completed stake-out.
- Advance post to embedment depth as shown on final drawing.
- **Position string lines:** bottom string line is used for correct placement of post; top string line indicates correct embedment depth: string is run from top of first post to top of first post of adjacent rack.
- When installing subsequent posts, ram until hammer head touches top string line.
- Upon completion of post pile drive, check that each post meets appropriate tolerances.
- If posts do not fall within tolerances, contact your Schletter representative.

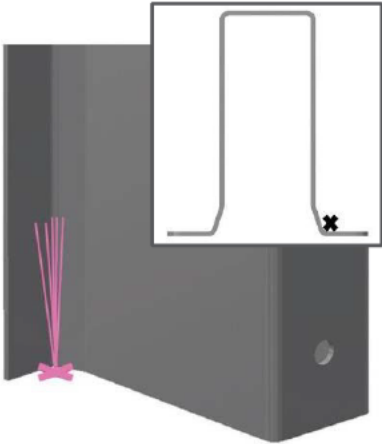


Notes:

If after ramming post, there are signs of cracking, use 95% zinc paint to touch up post



Mark each post location using soil nails with flagging



Position posts on marked locations



Ram two posts at opposite ends of array for string line



Use string line as guide to determine correct placement and depth of posts



Position hydraulic ram and lift post into position beneath ram head

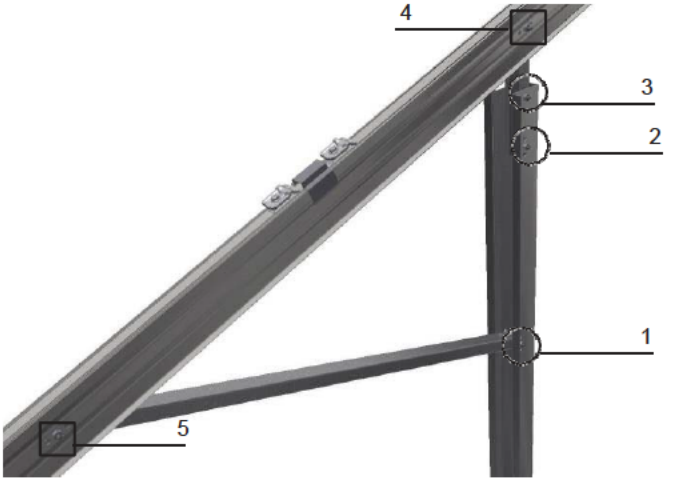
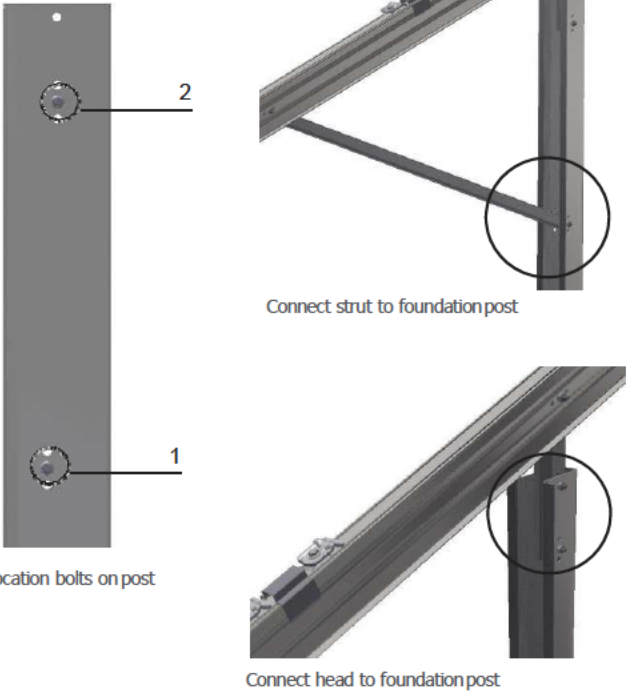




Hammer head touching top string line indicates correct depth is reached

MOUNTING THE INDIVIDUAL ASSEMBLY GROUPS

1. Mount Girder Assembly

- Girder, strut, and head are pre-assembled for ease of installation and adjustability to ensure that specified tilt angle and clearance tolerances are maintained.
- Install location bolts (shown as 1 and 2); hand tighten to allow for installation of girder assembly.
- Position strut onto previously installed lower location bolt.
- Position head onto upper location bolt
- Pivot girder until head and post align.
- Secure girder assembly in place by installing bolt at upper post hole location (shown as 3).
- Check angle of girder and ground clearance; refer to construction drawings for measurement.
- Ground clearance is a reference dimension only and can be affected by adjustment to rack. See project drawings.
- Tighten post bolts using 19 mm socket.



Overview of Field Installed Bolts and Factory Installed Bolts: Bolts 1, 2, and 3 (shown as ) are field installed during the girder assembly installation and should be snug tight and NOT torqued. Bolts 4 and 5 (shown as ) are factory installed to snug tight and should NOT be torqued.



Notes:

Multiple hole patterns are provided to ensure that specified tilt angle and ground clearances are maintained.

Field installed bolts (shown as 1, 2 and 3) are to be installed snug tight⁷ and are NOT to be torqued!

Factory installed bolts (shown as 4 and 5) have been factory installed to snug tight and should NOT be torqued!

⁷ Snug-tight is the condition that exists when all of the plies in a connection have been pulled into firm contact by the bolts in the joint, and all the bolts in the joint have been tightened sufficiently to prevent the removal of the nuts without the use of a wrench.

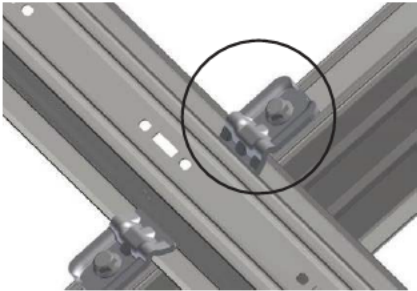
MOUNTING THE INDIVIDUAL ASSMEBY GROUPS

2. Mount Purlins

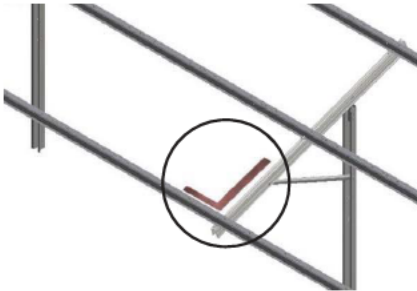
- Mount purlin to girder assembly starting with top purlin and working toward grade.
- Position purlin into lower purlin clamps.
- Check that purlins are square to girder using a carpenters square.
- Purlin clamps should not be torqued until racking is squared, prior to module installation; adjust as required.
- Tighten and torque purlin clamp to girder, while ensuring purlin stiffener is nested tightly.
- Tighten purlin clamps using 16 mm socket ensuring spring clip is properly oriented.



Mount purlin perpendicular to girder



Position purlin in purlin clamps



Use a carpenter's square to check that purlins and girder are square



Torque purlin clamps as specified on project drawings using 16 mm socket



Notes:

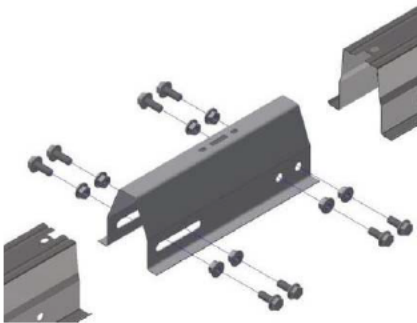
Purlin must be mounted square to girder.

The purlin cantilever and distances between purlins must be observed as specified in provided project drawing.

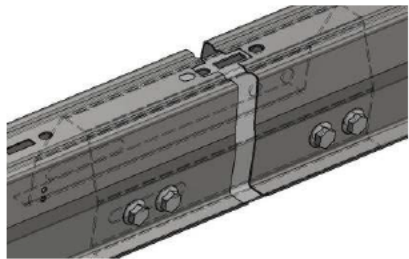
Please consult project drawings for purlin orientation.

3. Splice Connection

- Consult system specific drawings for splice locations.
- Splice sleeve bolts should not be torqued until racking is squared prior to module installation adjust as required.
- Torque to specification with 19 mm socket. Refer to project drawings for torque values.



Secure splice connection with M12x30 bolts and nuts



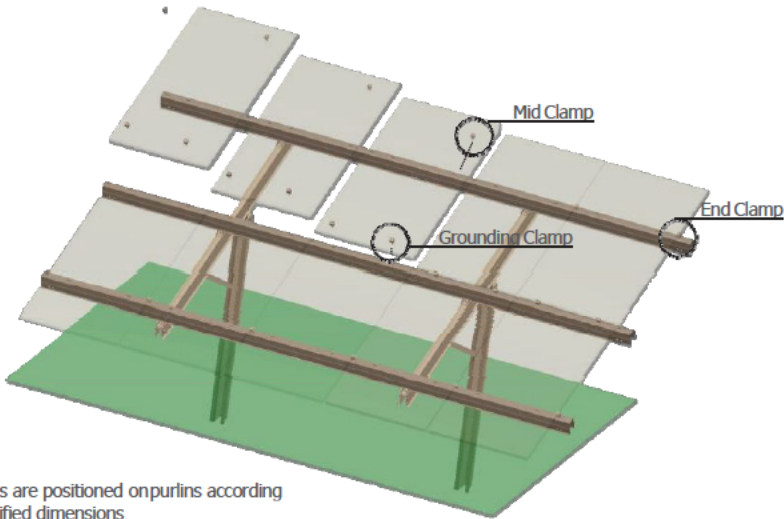
Complete splice

MODULE MOUNTING

Module Mounting

1. Position Modules

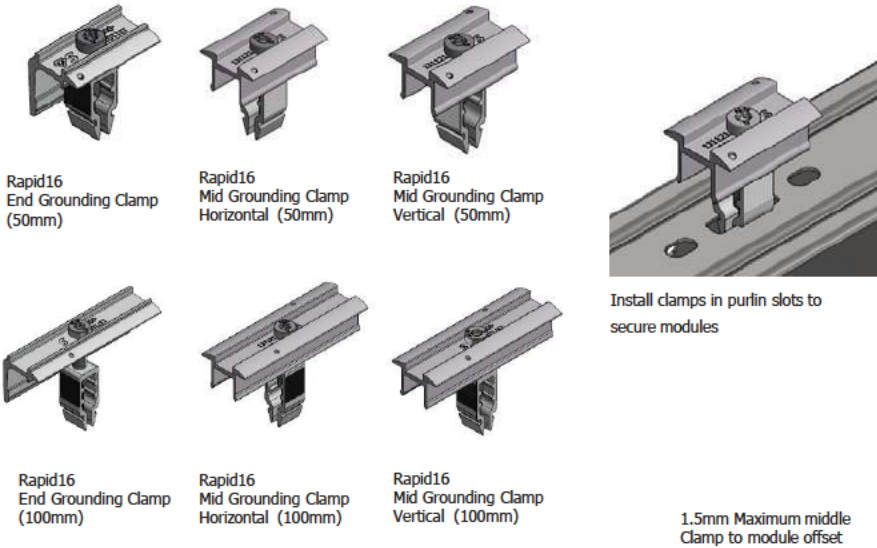
- Install clamps in purlin slots.
- Purlins are positioned according to module dimensions.
- **Rapid16™** clamps 2.0 (referred to as Rapid16 clamps) must be used on middle purlins.



Modules are positioned on purlins according to specified dimensions

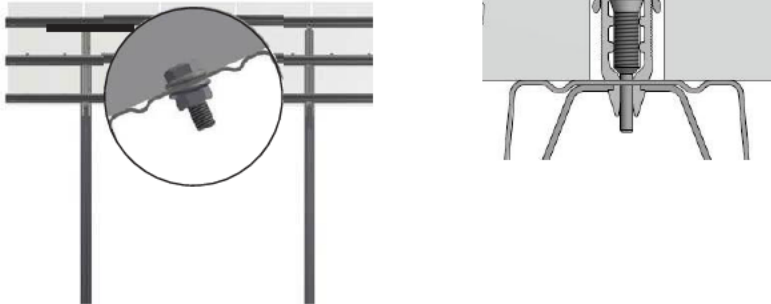
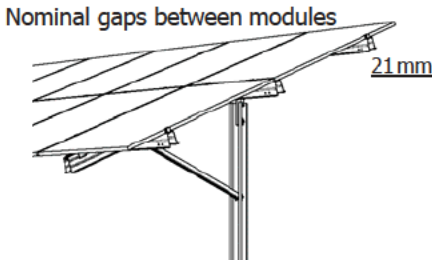
2. Secure Modules

- **Do NOT** use impact driver.
- Verify that module clamp is fully engaged on purlin and that module clamp is aligned with module frame.
- When mounting modules, please observe clamping points specified by module manufacturer.
- Install module clamps/hardware
- Speed setting on power drill **SHOULD NOT EXCEED** 1,000 rpm. Installation speed exceeding 1,000 rpm may damage clamp hardware.
- Torque clamps and hardware to specification.



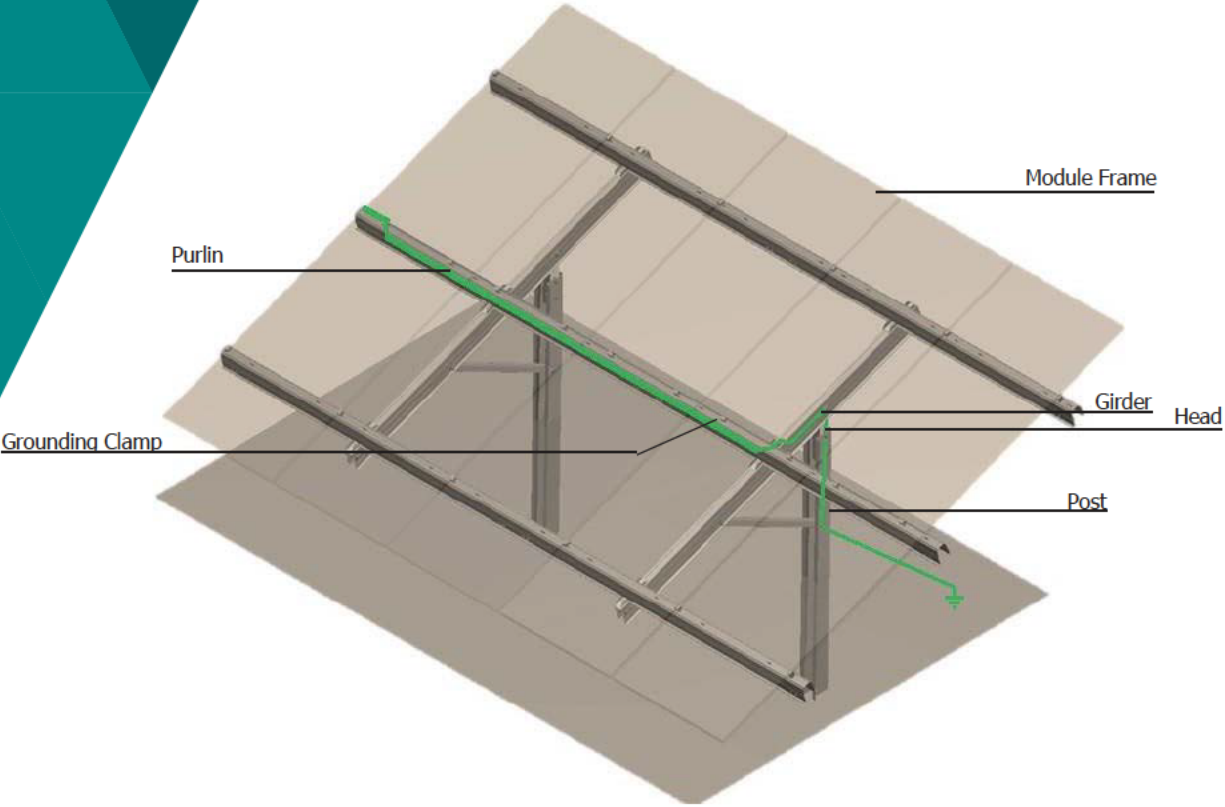
3. Module Mounting Options

- Direct bolt connection



Direct bolt connection using bolts on first and third purlins and Schletter's Rapid16 Clamp on the middle purlin

GROUNDING PATH DIAGRAM



OPTIONAL ACCESSORIES

1. Bonding Jumper

- Install bonding jumper on pre-punched holes at end of purlin using M12 bolt, washer, and M12 nut.



Notes:

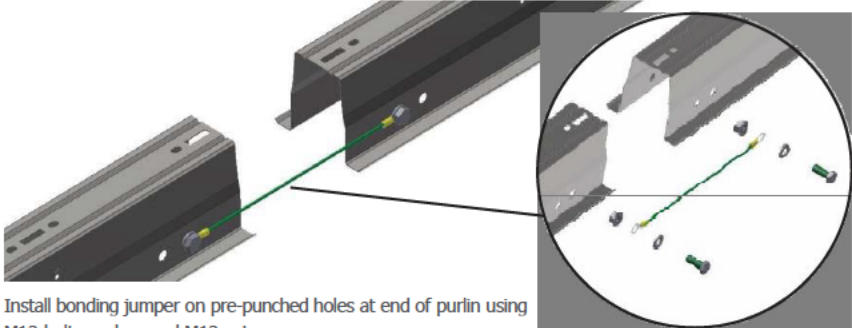
Electrically bonds adjacent systems forming a continuous ground path.

Connects directly to purlin.

Available in 12-inch lengths (additional lengths available upon request).

Used for expansion joints or other breaks in solar mounting system.

See electrical drawings for locations and quantities of bonding jumpers



Install bonding jumper on pre-punched holes at end of purlin using M12 bolt, washer, and M12 nut

2. Install Overcurrent Protection Device (Grounding)

- Shares bolt that connects strut to post.
- Remove serrated flange and install grounding lug, torque to specification. See Project drawings for torque values.
- Accommodates stranded or solid copper wire (14 gauge to 2 gauge).
- Must use bare copper wire to connect to grounding lug. If using insulated grounding wire, remove at least two inches of insulation to expose copper wire.



Loosen or remove top portion of grounding lug and insert grounding wire into appropriate groove

Grounding wire must extend through grounding lug by at least 1/4"

TORQUE SPECIFICATIONS AND TOLERANCES

Systems are specifically designed for each project. Please reference the specific project drawing for allowable tolerances and recommended torque for each size of bolt used in the system.

In the event of deviation from approved drawings, contact Schletter immediately.

Torx Bolt for Rapid16 Module Clamps	13–15 N-M	10–11 FT-LBS
M6 and 1/4” Bolt	5–7 N-M	4–5 FT-LBS
M8 and 5/16” Bolt	13–15 N-M	10–11 FT-LBS
M12 and 1/2” Bolt	47–53 N-M	35–39 FT-LBS
M20 and 3/4” Bolt	232–256 N-M	171–189 FT-LBS

MAINTENANCE

- Yearly inspection of system should be conducted to maintain optimal performance.
- Visually inspect for signs of damage, wear, corrosion, or movement. Replace any affected components immediately.
- Check for loose wiring.
- Maintenance should only be performed by qualified personnel.
- Check mechanical details of structure:
 - At least 2% of bolted connections must be checked using a calibrated torque wrench. The torque wrench must have a display or be a click type torque wrench.
 - Torque wrench should be set at 50% of intended tightening torque. Check is successful if bolt cannot be loosened.
 - If >10% of checked bolted connections are loose, check has to be increased to 10% of all bolted connections.
 - If more than 10% of connections are still loose, all bolted connections must be checked.
 - Tighten all non-conforming bolts to specified torques
 - Requirements per ASME B107 and AISC



WARNING: Risk of death by electric shock.

AVERTISSEMENT: Danger de mort par secousse électrique.

SAFETY PRECAUTIONS

Follow proper installation and safety procedures at all times. Edges of parts may be sharp. Follow proper lifting procedures.

FOR MORE INFORMATION

For United States, visit www.schletter.us or call 888-608-0234 or for Canada, visit www.schletter.ca or call 519-946-3800 to speak to a Schletter representative for more information.

APPENDIX I

UL 2703 Qualified Modules for use with the following Schletter racking systems:

Fix-RL, Flushmount, FixGrid 18, FixGrid18-100, PvMax, G-Max

Revision Date: 30-Sep-20

Manufacturer	Model
Boviet Solar	BVM6612
Canadian Solar	CS6X-P-FG
	CS6X-P
	CS6V-M
	CS6U-P
	CS6U-M
	CS6U
	CS6P-P-SD
	CS6P-P
	CS6P-M
	CS6K-P-FG
	CS6K-P
	CS6K-MS
	CS6K-M AB
	CS6K-M
	CS6K
	CS5A-M
	CS3W-PB-AG
	CS3W-P
	CS3W-MS
	CS3W-MB-AG
	CS3W
	CS3U-PB-AG
	CS3U-P
	CS3U-MS
	CS3U-MB-AG
	CS3U
	CS3L-P
	CS3L-MS
	CS3L
	CS3K-PB-AG
	CS3K-P
	CS3K-MS
	CS3K-MB-AG
	CS3K
	CS1Y-MS

CS1U-MS
 CS1K-MS
 CS1H-MS

ET Solar

ET-M660 290|285|280|275|270 WW|WB
 ET-M672 340|335|330|325|320 BB
 ET-M672 345|340|335|330|325 WW|WB
 ET-P660 265|260|255|250 BB
 ET-P660 270|265|260|255 WW|WB
 ET-P672 315|310|305|300 BB
 ET-P672 320|315|310|305 WW|WB

Hanwha Q Cells

L-G2
 L-G3
 L-G4
 Q.PEAK DUO BLK-G5
 Q.Peak DUO BLK-G6
 Q.Peak DUO G6
 Q.Peak DUO LG6
 Q.PEAK DUO-G5.X
 Q.PEAK DUO-G5
 B.LINE PRO L G4.1
 B.LINE PLUS L G4.2
 B.LINE PRO L G4.2
 B.LINE PLUS BFR G4.1
 B.LINE PRO BFR G4.1
 Q.PEAK BLK G4.1/TAA
 Q.PEAK L G4.2 / 4.5
 Q.PEAK-G4.1|G4.1/MAX
 Q.PLUS BFR G4.1/ TAA or MAX
 Q.PLUS G4
 Q.PLUS L G4.1|G4.2
 Q.PRO BFR G4|G4.1|G4.3|G4.4
 Q.PRO G4
 Q.PRO L G4.1
 Q.PRO L G4.2
 Q.PRO L G4.5
 Q.PEAK DUO BLK-G5/SC
 Q.PEAK DUO BLK-G6+
 Q.PEAK DUO BLK-G6+ /TS
 Q.PEAK DUO BLK-G6+/AC
 Q.PEAK DUO BLK-G6+/SC
 Q.PEAK DUO BLK-G7
 Q.PEAK DUO BLK-G8
 Q.PEAK DUO BLK-G8+
 Q.PEAK DUO G6+/AC
 Q.PEAK DUO L-G5
 Q.PEAK DUO L-G5.1

- Q.PEAK DUO L-G5.2
- Q.PEAK DUO L-G5.3
- Q.PEAK DUO L-G6
- Q.PEAK DUO L-G6.1
- Q.PEAK DUO L-G6.2
- Q.PEAK DUO L-G6.3
- Q.PEAK DUO L-G6.4
- Q.PEAK DUO L-G6.5
- Q.PEAK DUO L-G6.6
- Q.PEAK DUO L-G6.7
- Q.PEAK DUO L-G7
- Q.PEAK DUO L-G7.1
- Q.PEAK DUO L-G7.2
- Q.PEAK DUO L-G7.3
- Q.PEAK DUO L-G7.4
- Q.PEAK DUO L-G7.5
- Q.PEAK DUO L-G7.6
- Q.PEAK DUO L-G7.7
- Q.PEAK DUO L-G8
- Q.PEAK DUO L-G8.1
- Q.PEAK DUO L-G8.2
- Q.PEAK DUO L-G8.3
- Q.PEAK DUO L-G8.3/BFF
- Q.PEAK DUO L-G8.3/BFG
- Q.PEAK DUO ML BLK-G9
- Q.PEAK DUO ML BLK-G9+
- Q.PEAK DUO ML-G9
- Q.PEAK DUO ML-G9+
- Q.PEAK DUO XL-G9
- Q.PEAK DUO XL-G9.1
- Q.PEAK DUO XL-G9.2
- Q.PEAK DUO XL-G9.3
- Q.PEAK DUO-G5
- Q.PEAK DUO-G5/SC
- Q.PEAK DUO-G6
- Q.PEAK DUO-G6/SC
- Q.PEAK DUO-G6+
- Q.PEAK DUO-G6+/SC
- Q.PEAK DUO-G7
- Q.PEAK DUO-G8
- Q.PEAK DUO-G8+
- Q.PLUS DUO L-G5
- Q.PLUS DUO L-G5.1
- Q.PLUS DUO L-G5.2
- Q.PLUS DUO L-G5.3 B10B68:B138

Heliene

Heliene 36|60|72|96M
Heliene 36|60|72|96P

Heliene MAX HOME PV Black 350
 Heliene MAX Series 430
 Helien 72 M G1

Hyundai Solar

HiS-M250|255|260|265RG
 HiS-M310|315|320|325TI
 HiS-S265|270|275RG
 HiS-S330|335|340|345|350TI

Jinko Solar

Eagle 60|72
 Eagle Black 60|72
 Eagle MX JK07A|JK07B
 Eagle PERC
 JKM265PP-60
 JKM270P-60-V
 JKM275P-60
 JKM275PP-60-V
 JKM320P-72-V
 JKM330P-72
 JKM330PP-72-V
 JKM390/395/400/405/410M-72HL-V
 JKMxxxM-60HBL
 JKMxxxM-72HL-TV
 JKMxxxM-7RL3-TV
 JKMxxxM-7RL3-V

Kyocera

KD260|265GX-LFB2
 KU260|265|270-6MCA
 KU260-6MCA
 KU315|320-7ZPA

LG

LGxxxN1C-A5
 LGxxxN1C-G4
 LGxxxN1K-G4
 LGxxxN1W-G4
 LGxxxN2C-B3
 LGxxxN2W-A5
 LGxxxN2W-B3
 LGxxxS1C-A5
 LGxxxS1C-G4
 LGxxxS1W-G4
 LGxxxS2W-A5
 LGxxxN2T-A5
 LGxxxN1T-V5
 LGxxxN2T-V5
 LGxxxQ1C-V5
 LGxxxQ1K-V5
 LGxxxA1C-V5

LGxxxN2T-J5
LGxxxN1C-V5
LGxxxN1K-V5
LGxxxN1C-N5
LGxxxN1C-A6
LGxxxN1K-L5
LGxxxN1K-A6
LGxxxQ1C-A6
LGxxxQ1K-A6
LGxxxN2W-L5
LGxxxN2W-E6
LGxxxN2T-E6
LGxxxN2T-L5

Longi

LR6-60PE 300-320M
LR6-60HPH xxx M
LR6-72BP 355-375M
LR6-72HPH xxx M
LR6-72PH xxx M
LR4-72HBD 415-435M
LR4-72HBH 420-440M
LR4-72HBD xxx M
LR4-60HBD xxx M
LR4-72HPH/HIH xxx M
LR4-60HPH/HIH xxx M
LR4-60HPB/HIB xxx M

Philadelphia Solar

PS-M60
PS-M60(BF)
PS-M72
PS-M72(BF)
PS-P60
PS-P72

Phono Solar

PS xxx P-20/U
PS xxx PH-20/U
PS xxx M-20/UH
PS xxx MH-20/UH

REC Solar

PEAK Energy Series REC245|250|255|260|265|270PE
PEAK Energy BLK2 Series REC245|250|255|260PE BLK2
TWINPEAK SERIES REC265|270|275|280|285TP
PEAK Energy 72 Series REC300|295 - 315PE
TWINPEAK REC330|335|340TP72
TWINPEAK 2 BLK2 SERIES RECxxxTP2 BLK2
TWINPEAK 2 SERIES
TWINPEAK 2S 72 Series RECxxxTP2S 72
REC Alpha - RECxxxAA

	<p>REC Alpha 72 - RECxxxAA 72 REC Alpha Black - RECxxx Black REC N-Peak-RECxxxNP REC N-Peak-RECxxxNP Black REC TP2SM72-RECxxxTP2SM72 Twin Peak 3M - RECxxxTP3M Twin Peak 3M - RECxxxTP3M Black</p>
Risen	RSM60-6-270M-290M/5BB
Silfab	<p>Silfab-SIL-330-BL Silfab-SIL-330-NL Silfab-SIL-380-NT Silfab-SIL-400 HU Silfab-SIL-400-HL-B</p>
Solaria	<p>PowerXT-400R-PM PowerXT-400R-PM-AC</p>
SolarWorld	<p>Sunmodule Plus SW 275-290 MONO BLACK Sunmodule Plus SW 280-290 MONO BLACK (5-busbar) Sunmodule Plus SW 280-295 MONO Sunmodule Plus SW 285-300 MONO (5-busbar) Sunmodule Pro-Series SW 260 POLY WOB Sunmodule Protect SW 275-280 MONO BLACK Sunmodule SW 100 POLY RGP Sunmodule SW 150 MONO R6A Sunmodule SW 150 POLY R6A Sunmodule SW 320-325 340-350 XL MONO Sunmodule SW 80 MONO RHA</p>
SUNPOWER	SPR-X21-xxx-COM
Suntech	<p>STPxxxS – A60U/Wfhb STPxxxS - A72U/Vfh STPxxxS - A72U/Vnh STPxxxS-24/Vfw</p>
Talesun	<p>FEATHER 2.0 TP660P Hipro M295+ TP660M Hipro M350+ TP672M PID ZERO TP672M TD660M TD660P TP660 672M TP660 672P TP660 672P(H)</p>

Trina

- TSM-xxx PA05.08
- TSM-DE14A
- TSM-DD14A
- TSM-PD05
- TSM-PD05.05
- TSM-PD05.08
- TSM-xxx DD05A.05(II)
- TSM-xxx PD05.08
- TSM-xxx PD05.10
- TSM-PD14
- TSM-PE14
- TSM-PEG14
- TSM-PEG40.07
- TSM-PEG5
- TSM-PEG5.07
- TSM-DD06M.05(II)
- TSM-DE06H
- TSM-DE06M
- TSM-DE15H
- TSM-DE15M
- TSM-DE18M
- TSM-DEG06H
- TSM-DEG06M
- TSM-DEG15HC.20(II)
- TSM-DEG15M.20(II)
- TSM-DEG15MC.20(II)
- TSM-DEG18MC.20(II)
- TSM-PE06H
- TSM-PE15H
- TSM-PEG06H
- TSM-PEG15H.20

WattPower

- Glacier Series G3
- WP-xxxM/G3-60H-V (325 | 330 | 335 | 340PC)

Yingli Green Energy

- YL260P | 255P | 250P | 245P | 240P-29b
- YL275P | 270P | 265P | 260P | 255P | 250P-29b
- YL290D | 285D | 280D | 275D | 270D-30b
- YL300C | 295C | 290C | 285C | 280C | 275C-30b
- YL325P | 320P | 315P | 310P | 305P | 300P-35b
- YL340D | 335D | 330D | 325D | 320D | 315D-36b

ZNShine

- ZXM6-60-xxx_M
- ZXM6-H120-xxx_M
- ZXM6-H144-xxx_M
- ZXM6-HLD120-xxx_M
- ZXM6-HLD144-xxx_M
- ZXM6-HLDD144-xxx_M

ZXM6-LD60-xxx_M
ZXM6-LD72-xxx_M
ZXM6-LDD72-xxx_M
ZXM6-NH120-xxx_M
ZXM6-NH144-xxx_M
ZXM6-NHLD120-xxx_M
ZXM6-NHLD144-xxx_M
ZXM6-NHLDD120-xxx_M
ZXM6-NHLDD144-xxx_M
ZXP6-72-xxx_P
ZXP6-H144-xxx_P
ZXP6-HLD120-xxx_P
ZXP6-HLD144-xxx_P
ZXP6-LD72-xxx_P

APPENDIX II

Approved Micro-Inverters for use with the following Schletter racking systems:

Fix-RL, Flushmount, FixGrid 18, FixGrid18-100, PvMax, G-Max

Revision Date: 13-October-20

Manufacturer	Model
Enphase	M215 M250
Darfon	G320
AEconversion	INV500-90

SCHLETTER
The Solar Mounting Group

SCHLETTER NA INC.
5200 77 Center Drive Suite 250
Charlotte, NC
28217

Phone: +1 704 595-4200
Fax: +1 704 595-5210
fixedtiltNA@schletter-group.com

www.schletter-group.com

We reserve the right to changes, including technical modification.

blueplanet 150 TL3

Transformerless, three-phase string inverter.



The trendsetter among inverters.

Optimized for solar power plants
with 1500 volt modules

Extensive grid management
functions

Special properties for extreme
climatic conditions

Farsighted technical features for
future requirements

Lean commissioning and
maintenance via remote services

Technical Data

DC input data	
Max. recommended PV generator power	150 TL3 225 000 W
MPP range	960 – 1 300 V
Operating range	960 – 1 450 V
Rated DC voltage / start voltage	1 000 V / 1 100 V
Max. no-load voltage	1 500 V
Max. input current	160 A
Max. short circuit current $I_{sc\ max}$	300 A
Number of MPP tracker	1
Connection per tracker	1 - 2
AC output data	
Rated output	150 000 VA
Max. power	150 000 VA
Line voltage	660 V (3P+PE)
Voltage range (Ph-Ph)	480 – 760 V
Rated frequency (range)	50 Hz / 60 Hz (45 – 65 Hz)
Rated current	3 x 131,2 A
Max. current	3 x 132,3 A
Reactive power / cos phi	0 – 100 % Snom / 0,30 ind. – 0,30 cap.
Max. total harmonic distortion (THD)	≤ 3 %
Number of grid phases	3
General data	
Max. efficiency	99.2 %
Europ. efficiency	99.1 %
CEC efficiency	99.0 %
Standby consumption	< 10 W
Circuitry topology	transformerless
Mechanical data	
Display	LEDs
Control units	webserver, supports mobile devices
Interfaces	Ethernet (Modbus TCP, Sunspec) RS485 (Modbus RTU, Sunspec, KACO-protocol) USB, optional: 4-DI, WIFI
Fault signalling relay	potential-free NOC max. 30 V / 1 A
DC connection	cable lug, max. 240 mm ² (0.372 in ²) Cu or Al
AC connection	cable lug, max. 240 mm ² (0.372 in ²) Cu or Al
Ambient temperature	-25 °C – +60 °C ¹⁾
Humidity	0 – 100 %
Max. installation elevation (above MSL)	3 000 m
Min. distance from coast	500 m
Cooling	temperature controlled fan
Protection class	IP66 / NEMA 4X
Noise emission	59.2 db (A)
H x W x D	719 x 699 x 450 mm
Weight	78.2 kg
Certifications	
Safety	UL62109-1, UL1741, CSA-C22.2 No. 62109-1, CSA-C22.2 No. 62109-2, CSA-C22.2 No. 107.1 IEC 62109-1/-2, EN 61000-6-1/-2/-3, EN 61000-3-11/-12
Grid connection rule	overview see homepage / download area

¹⁾ Power derating at high ambient temperatures

Versions	S	XL
Number of DC inputs	1 - 2	1 - 2
DC switch	-	✓
DC SPD	Type 1 + 2	Type 1 + 2
AC SPD	○	○
RS485 interface SPD	○	○
Ethernet interface SPD	○	○
PID Set	○	○

standard = ✓ upgradeable = ○

Text und Abbildungen entsprechen dem technischen Stand bei Drucklegung. Technische Änderungen vorbehalten. Keine Haftung für Druckfehler. Mit der aktuellen Version werden alle älteren Versionen ungültig. Die jeweils aktuelle Version finden Sie unter www.kaco-newenergy.com

DESCRIPTION

The patented Lumark Crosstour™ LED Wall Pack Series of luminaires provides an architectural style with super bright, energy efficient LEDs. The low-profile, rugged die-cast aluminum construction, universal back box, stainless steel hardware along with a sealed and gasketed optical compartment make the Crosstour impervious to contaminants. The Crosstour wall luminaire is ideal for wall/surface, inverted mount for façade/canopy illumination, post/bollard, site lighting, floodlight and low level pathway illumination including stairs. Typical applications include building entrances, multi-use facilities, apartment buildings, institutions, schools, stairways and loading docks test.

SPECIFICATION FEATURES

Construction

Slim, low-profile LED design with rugged one-piece, die-cast aluminum hinged removable door and back box. Matching housing styles incorporate both a small and medium design. The small housing is available in 12W, 18W and 26W. The medium housing is available in the 38W model. Patented secure lock hinge feature allows for safe and easy tool-less electrical connections with the supplied push-in connectors. Back box includes three half-inch, NPT threaded conduit entry points. The universal back box supports both the small and medium forms and mounts to standard 3-1/2" to 4" round and octagonal, 4" square, single gang and masonry junction boxes. Key hole gasket allows for adaptation to junction box or wall. External fin design extracts heat from the fixture surface. One-piece silicone gasket seals door and back box. Minimum 5" wide pole for site lighting application. Not recommended for car wash applications.

Optical

Silicone sealed optical LED chamber incorporates a custom engineered mirrored anodized reflector providing high-efficiency illumination. Optical assembly includes impact-resistant tempered glass and meets IESNA requirements for full cutoff compliance. Available in seven lumen packages; 5000K, 4000K and 3000K CCT.

Electrical

LED driver is mounted to the die-cast housing for optimal heat sinking. LED thermal management system incorporates both conduction and natural convection to transfer heat rapidly away from the LED source. 12W, 18W, 26W and 38W series operate in -40°C to 40°C [-40°F to 104°F]. High ambient 50°C models available. Crosstour luminaires maintain greater than 89% of initial light output after 72,000 hours of operation. Three half-inch NPT threaded conduit entry points allow for thru-branch wiring. Back box is an authorized

Catalog #		Type
Project		
Comments		Date
Prepared by		

electrical wiring compartment.

Integral LED electronic driver incorporates surge protection. 120-277V 50/60Hz or 347V 60Hz models.

Finish

Crosstour is protected with a Super durable TGIC carbon bronze or summit white polyester powder coat paint. Super durable TGIC powder coat paint finishes withstand extreme climate conditions while providing optimal color and gloss retention of the installed life.

Warranty

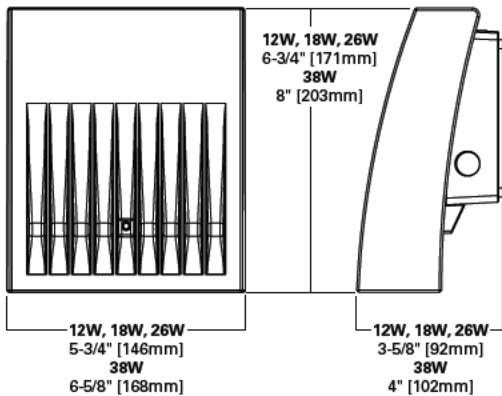
Five-year warranty.



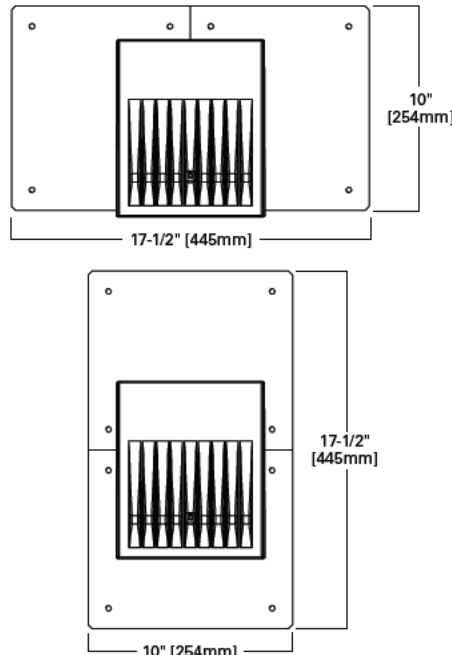
**XTOR
CROSTOUR LED**

- APPLICATIONS:**
 WALL / SURFACE
 POST / BOLLARD
 LOW LEVEL
 FLOODLIGHT
 INVERTED
 SITE LIGHTING

DIMENSIONS



ESCUTCHEON PLATES



CERTIFICATION DATA
 Dark Sky Approved (Fixed mount, Full cutoff, and 3000K CCT only)
 UL/cUL Wet Location Listed
 LM79 / LM80 Compliant
 ROHS Compliant
 ADA Compliant
 NOM Compliant Models
 IP66 Ingressed Protection Rated
 Title 24 Compliant
 DesignLights Consortium® Qualified*

TECHNICAL DATA
 40°C Maximum Ambient Temperature
 External Supply Wiring 90°C Minimum

EPA
 Effective Projected Area (Sq. Ft.):
 XTOR1B, XTOR2B, XTOR3B=0.34
 XTOR4B=0.45

SHIPPING DATA:
 Approximate Net Weight:
 3.7 – 5.25 lbs. [1.7 – 2.4 kgs.]

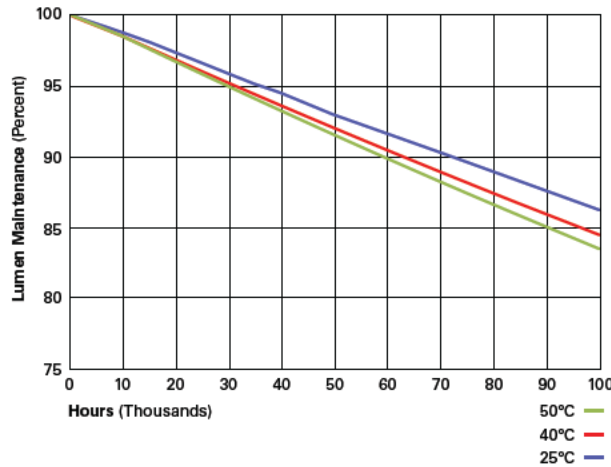
POWER AND LUMENS BY FIXTURE MODEL

LED Information	XTOR1B	XTOR1B-W	XTOR1B-Y	XTOR2B	XTOR2B-W	XTOR2B-Y	XTOR3B	XTOR3B-W	XTOR3B-Y	XTOR4B	XTOR4B-W	XTOR4B-Y
Delivered Lumens (Wall Mount)	1,418	1,396	1,327	2,135	2,103	1,997	2,751	2,710	2,575	4,269	4,205	3,995
Delivered Lumens (With Flood Accessory Kit) ¹	1,005	990	940	1,495	1,472	1,399	2,099	2,068	1,965	3,168	3,121	2,965
B.U.G. Rating ²	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B2-U0-G0	B2-U0-G0	B2-U0-G0
CCT (Kelvin)	5,000	4,000	3,000	5,000	4,000	3,000	5,000	4,000	3,000	5,000	4,000	3,000
CRI (Color Rendering Index)	70	70	70	70	70	70	70	70	70	70	70	70
Power Consumption (Watts)	12W	12W	12W	18W	18W	18W	26W	26W	26W	38W	38W	38W

NOTES: 1 Includes shield and visor. 2 B.U.G. Rating does not apply to floodlighting.

LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (72,000 Hours)	Theoretical L70 (Hours)
XTOR1B Model		
25°C	> 90%	255,000
40°C	> 89%	234,000
50°C	> 88%	215,000
XTOR2B Model		
25°C	> 89%	240,000
40°C	> 88%	212,000
50°C	> 87%	196,000
XTOR3B Model		
25°C	> 89%	240,000
40°C	> 88%	212,000
50°C	> 87%	196,000
XTOR4B Model		
25°C	> 89%	222,000
40°C	> 87%	198,000
50°C	> 87%	184,000



CURRENT DRAW

Voltage	Model Series			
	XTOR1B	XTOR2B	XTOR3B	XTOR4B
120V	0.103A	0.15A	0.22A	0.34A
208V	0.060A	0.09A	0.13A	0.17A
240V	0.053A	0.08A	0.11A	0.17A
277V	0.048A	0.07A	0.10A	0.15A
347V	0.039A	0.06A	0.082A	0.12A

ORDERING INFORMATION

Sample Number: XTOR2B-W-WT-PC1

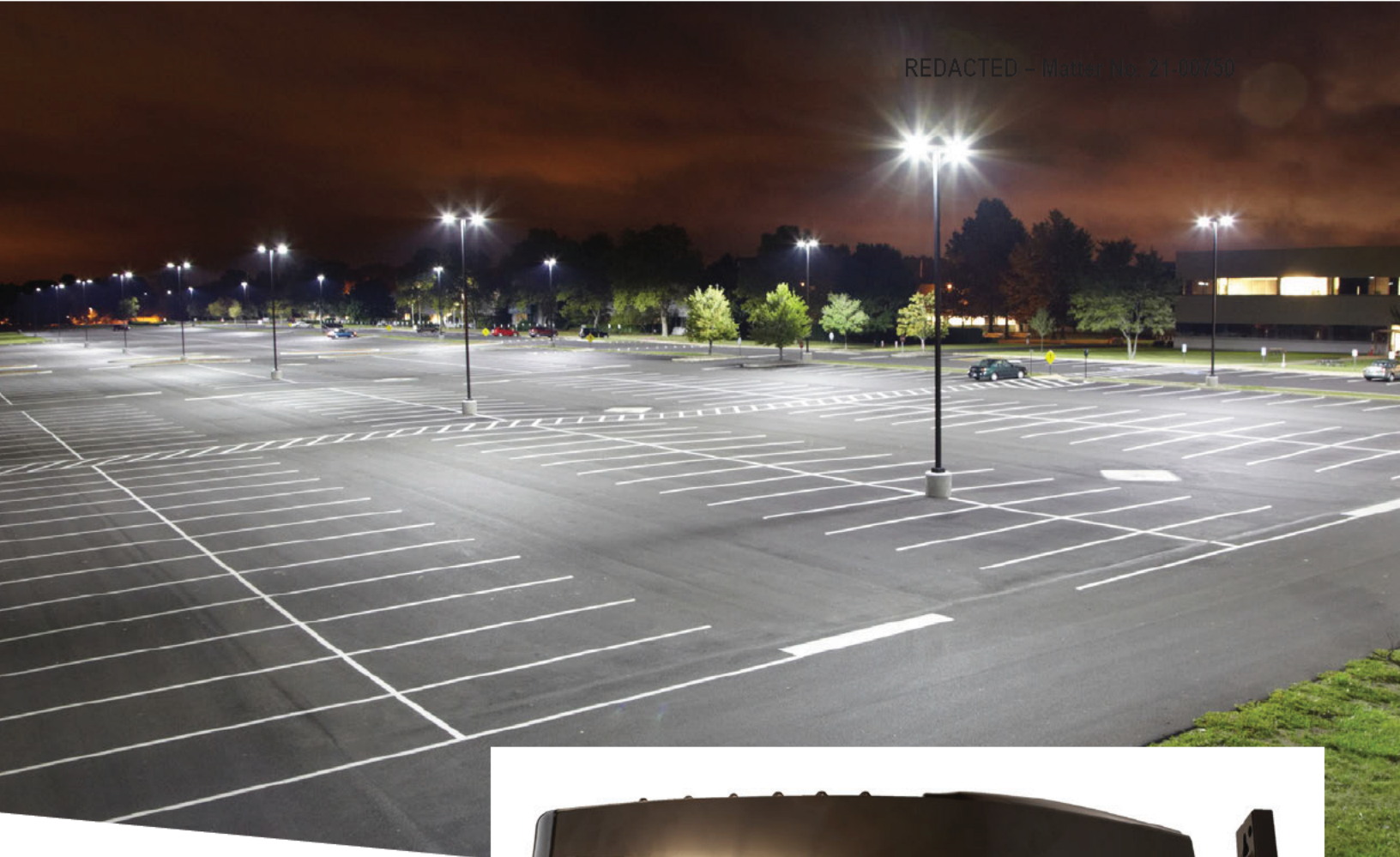
Series ¹	LED Kelvin Color	Housing Color	Options (Add as Suffix)	Accessories (Order Separately)
XTOR1B =Small Door, 12W XTOR2B =Small Door, 18W XTOR3B =Small Door, 26W XTOR4B =Medium Door, 38W	[Blank] =Bright White (Standard), 5000K W =Neutral White, 4000K Y =Warm White, 3000K	[Blank] =Carbon Bronze (Standard) WT =Summit White BK =Black BZ =Bronze AP =Grey GM =Graphite Metallic DP =Dark Platinum	PC1 =Photocontrol 120V ² PC2 =Photocontrol 208-277V ^{2 3} 347V =347V ⁴ HA =50°C High Ambient ⁴	WG/XTOR =Wire Guard ⁵ XTORFLD-KNC =Knuckle Floodlight Kit ⁶ XTORFLD-TRN =Trunnion Floodlight Kit ⁶ XTORFLD-KNC-WT =Knuckle Floodlight Kit, Summit White ⁶ XTORFLD-TRN-WT =Trunnion Floodlight Kit, Summit White ⁶ EWP/XTOR =Escutcheon Wall Plate, Carbon Bronze EWP/XTOR-WT =Escutcheon Wall Plate, Summit White

NOTES:

1. DesignLights Consortium® Qualified and classified for both DLC Standard and DLC Premium, refer to www.designlights.org for details.
2. Photocontrols are factory installed.
3. Order PC2 for 347V models.
4. Thru-branch wiring not available with HA option or with 347V. XTOR3B not available with HA and 347V or 120V combination.
5. Wire guard for wall/surface mount. Not for use with floodlight kit accessory.
6. Floodlight kit accessory supplied with knuckle (KNC) or trunnion (TRN) base, small and large top visors and small and large impact shields.

STOCK ORDERING INFORMATION

12W Series	18W Series	26W Series	38W Series
XTOR1B =12W, 5000K, Carbon Bronze	XTOR2B =18W, 5000K, Carbon Bronze	XTOR3B =26W, 5000K, Carbon Bronze	XTOR4B =38W, 5000K, Carbon Bronze
XTOR1B-WT =12W, 5000K, Summit White	XTOR2B-W =18W, 4000K, Carbon Bronze	XTOR3B-W =26W, 4000K, Carbon Bronze	XTOR4B-W =38W, 4000K, Carbon Bronze
XTOR1B-PC1 =12W, 5000K, 120V PC, Carbon Bronze	XTOR2B-WT =18W, 5000K, Summit White	XTOR3B-WT =26W, 5000K, Summit White	XTOR4B-WT =38W, 5000K, Summit White
XTOR1B-W =12W, 4000K, Carbon Bronze	XTOR2B-PC1 =18W, 5000K, 120V PC, Carbon Bronze	XTOR3B-PC1 =26W, 5000K, 120V PC, Carbon Bronze	XTOR4B-PC1 =38W, 5000K, 120V PC, Carbon Bronze
	XTOR2B-W-PC1 =18W, 4000K, 120V PC, Carbon Bronze	XTOR3B-W-PC1 =26W, 4000K, 120V PC, Carbon Bronze	XTOR4B-W-PC1 =38W, 4000K, 120V PC, Carbon Bronze
	XTOR2B-347V =18W, 5000K, Carbon Bronze, 347V	XTOR3B-347V =26W, 5000K, Carbon Bronze, 347V	XTOR4B-347V =38W, 5000K, Carbon Bronze, 347V
	XTOR2B-WT-PC1 =18W, 5000K, 120V PC, Summit White	XTOR3B-PC2 =26W, 5000K, 208-277V PC, Carbon Bronze	



GE Evolve™
LED Area Lighting
EALS-03 & EALP-03

Product Features

The **EAL Area Light** luminaires offer a wide range of optical patterns, color temperatures, lumen packages, and mounting configurations to optimize area light applications, as well as provide versatility in lighting design within the same form-factor. They are ideal for commercial property site-lighting applications such as retail and commercial exteriors. The EALS (standard) area light has a lumen range from 7,500-30,000 lumens. The EALP (premium) offers a similar lumen range of 25,000 to 70,000 lumens but with higher LPW and better lumen maintenance.

Both the **EALS-03** and **EALP-03** feature our innovative, highly flexible Universal Mounting Arm option, which provides installers the ability to mount the EAL fixtures on both round and square poles of multiple sizes. In addition, it features both in-line and offset bolt patterns which enable it to easily be affixed to the majority of the bolt patterns one would encounter in the field.

Applications

- Site and area light applications such as parking lots, retail exteriors, commercial exteriors, roadways and other general lighting applications

Housing

- Slim architectural design incorporates an integral heat sink and light engine, ensuring maximum heat transfer, and long LED life.
- Die cast aluminum housing
- 3G vibration per ANSI C136.31-2010

LED & Optical Assembly

- LM-79 tests and reports in accordance with IESNA standards
- 70CRI at 3000K, 4000K and 5000K
- Distributions: II, III, IV, V
- Upward Light Output Ratio (ULOR) = 0 (horizontal orientation)

Lumen Maintenance

- Projected Lxx per IES TM-21 at 25 °C for reference:

EALS03 Optical code	Lxx (10k) @ Hours		
	25,000 hr	50,000 hr	100,000 hr
C2, C3, C4, C5, D2, D3, D4, D5	L95	L92	L86
F5, H2, H3, H4, H5	L95	L92	L86
F2, F3, F4, J2, J3, J4, J5	L94	L89	L81
K2, K3, K4, K5	L94	L89	L81



EALP03 Optical code	Lxx (10k) @ Hours		
	25,000 hr	50,000 hr	100,000 hr
J5, K2, K3, K4, K5	L97	L96	L94
L2, L3, L4, L5, M2, M3, M4, M5	L97	L96	L94
J2, J3, J4, N2, N3, N4, N5	L94	L91	L84
P2, P3, P4, P5, Q2, Q3, Q4, Q5	L94	L91	L84

Note: 1) Projected Lxx based on LM80 (10,000 hour testing). 2) DOE Lighting Facts Verification Testing Tolerances apply to initial luminous flux and lumen maintenance measurements

Lumen Ambient Temperature Factors:

Ambient Temp (°C)	Initial Flux Factor
10	1.02
20	1.01
25	1.00
30	0.99
40	0.98

Ratings

-  cUL Listed
-  UL 1598 Listed Suitable for Wet Locations
- IP65 optical enclosure per ANSI C136.25-2013
- Operating Temperature -40°C to +40°C (maximum of +35°C for 570W)
- California Title 24 compliant (w/ "H" motion sensor option)

Mounting

Option C1: Integral Slipfitter for 1.25"-2" Pipe (1.66in. OD-2.378in. OD) supplied with leads. +/- 5 deg adjustment for leveling.

Option D1: Universal Mounting Arm, fitted for round or square pole mounting supplied with 16/3 3ft cable.

Option K1: Knuckle Slipfitter for 1.9 in.-2.3 in. OD Tenon with leads. Restricted aiming angle 0° to +45°.

Option S1: Knuckle Slipfitter for 2.3in.- 3.0in OD Tenon with leads. Restricted aiming angle 0° to +45°.

Option V1: Knuckle Wall Mount with leads. Restricted aiming angle 0° to +45°.

Finish

- Corrosion resistant polyester powder paint, minimum thickness 2.0 mil.
- Standard colors: Black, Dark Bronze, Aluminum, Gray & White.
- RAL & custom colors available.
- Optional coastal finish available.

Electrical

- 120-277 VAC and 347-480 VAC available.
- System power factor is >90% and THD <20%.
- ANSI C136.41 7-pin dimming receptacle, standard.
- ANSI photo electric sensors (PE) available for all voltages.
- LightGrid™ compatible.
- Dimming/Occupancy:
 - Standard: 0-10V; Optional: DALI (120-277V, excluding 400 watts and above)
 - Externally wired 0-10V dimming (optional)
 - DALI digital dimming. Contact manufacturer for availability.
 - Standalone dimming occupancy sensor with ambient light sensor, option code "H".
 - Daintree occupancy sensor available.
- Surge Protection tested per ANSI C136.2-2015.
 - 6kV/3kA "Basic" surge protection, standard.
 - 10kV/5kA "Enhanced" surge protection optional.

Warranty

- 5 Year Standard

Accessories

- Photoelectric Controls (see page 9)
- Light Shields (see Data Sheet OLP 3120 Shielding for EAL Area Light Fixtures)

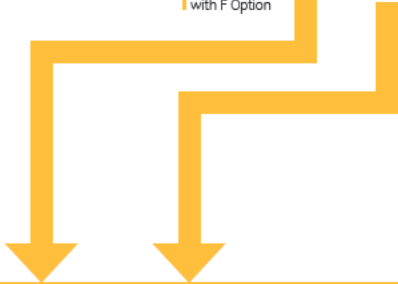
Ordering Number Logic

Evolve™ LED Area Light (EALS-03)



EALS 03 7

PROD. ID	GENERATION	VOLTAGE	OPTICAL DISTRIBUTION CODE	CRI	CCT	DIMMING	CONTROLS	MOUNTING ARM	COLOR	OPTIONS
E = Evolve AL = Area Light S = Standard	03 = 3rd Generation	0 = 120-277* 1 = 120 2 = 208 3 = 240 4 = 277 5 = 480 D = 347 H = 347-480* <small>*Not available with Fusing. Must choose a discreet voltage with F Option</small>	SM = Symmetric Medium SW = Symmetric Wide SH = Symmetric High Angle AF = Asymmetric Forward AH = Asymmetric High Angle AW = Asymmetric Wide AN = Asymmetric Narrow/Auto	7 = 70 (min)	30 = 3000K 40 = 4000K 50 = 5000K	N = Dimming thru PE receptacle D = External Dimming 18/2-3ft cable X = Non-dimmable* <small>All constructions supplied with ANSI C136.41 7-pin Receptacle</small> Note: Standard dimming 0-10V	A = ANSI 7-pin PE receptacle (no control) D = ANSI 7-pin PE receptacle with shorting cap provided Note: See accessories section on page 7 for PE Control ordering	C1 = Integral Slipfitter for 1.25" - 2" Pipe (1.66in. OD - 2.378in. OD)* D1 = Universal Mounting Arm, fitted for round or square pole mounting** K1 = Knuckle Slipfitter for 1.9 in - 2.3in. OD Tenon*** S1 = Knuckle Slipfitter for 2.3in. - 3.0in OD Tenon*** V1 = Knuckle Wall Mount*** <small>* Supplied with 3FT leads ** Supplied with 3FT #14/3 power cable *** Restricted Aiming Angle 0° to +45°</small>	GRAY = Gray BLCK = Black DKBZ = Dark Bronze WHITE = White	F = Fusing H = Motion Sensor (Sensor Switch) H2 = Motion Sensor (Daintree) J = cUL/Canada L = Tool-Less Entry R = Enhanced Surge Protection (10kV/5kA) S1 = Rotated Left † S2 = Rotated Right † U = DALI dimming ~+ V = 3-Position Terminal Block Y = Coastal Finish XXX = Special Options <small>* Contact Manufacturer for availability † Compatible with LightGrid 2.0 nodes ‡ Not compatible at 347-480V or with motion sensor control § For aimed left or right light distribution orientation as assembled in manufacturing Not applicable for Symmetric Distributions Note: H2 option not available at 370V-480V</small>

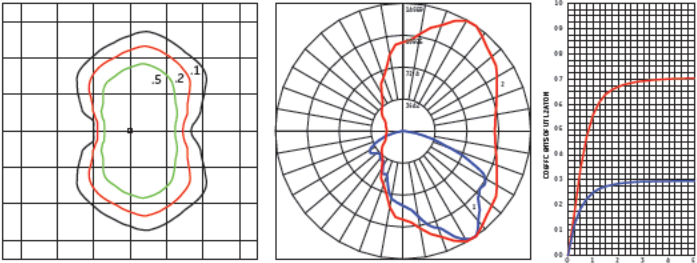


TYPE	OPTICAL CODE	DISTRIBUTION	TYPICAL INITIAL LUMENS		TYPICAL SYSTEM WATTAGE	BUG RATING		IES FILE NUMBER		
			3000K	4000K & 5000K	120-277V & 347-480V	3000K B-U-G	4000 & 5000K B-U-G	IES FILE NUMBER 3000K	IES FILE NUMBER 4000K	IES FILE NUMBER 5000K
Type V	C5	Symmetric Medium (SM)	7300	7500	46	B3-U0-G1	B3-U0-G1	EALS03 C5SM730 .IES	EALS03 C5SM740 .IES	EALS03 C5SM750 .IES
	D5	Symmetric Medium (SM)	9800	10000	64	B3-U0-G1	B3-U0-G1	EALS03 D5SM730 .IES	EALS03 D5SM740 .IES	EALS03 D5SM750 .IES
	F5	Symmetric Medium (SM)	14700	15000	101	B4-U0-G2	B4-U0-G2	EALS03 F5SM730 .IES	EALS03 F5SM740 .IES	EALS03 F5SM750 .IES
	H5	Symmetric Medium (SM)	19600	20000	140	B4-U0-G2	B4-U0-G2	EALS03 H5SM730 .IES	EALS03 H5SM740 .IES	EALS03 H5SM750 .IES
	J5	Symmetric Medium (SM)	24500	25000	186	B4-U0-G2	B4-U0-G2	EALS03 J5SM730 .IES	EALS03 J5SM740 .IES	EALS03 J5SM750 .IES
	K5	Symmetric Medium (SM)	29400	30000	239	B5-U0-G3	B5-U0-G3	EALS03 K5SM730 .IES	EALS03 K5SM740 .IES	EALS03 K5SM750 .IES
	C5	Symmetric Wide (SW)	7300	7500	46	B2-U0-G1	B2-U0-G1	EALS03 C5SW730 .IES	EALS03 C5SW740 .IES	EALS03 C5SW750 .IES
	D5	Symmetric Wide (SW)	9800	10100	64	B3-U0-G1	B3-U0-G1	EALS03 D5SW730 .IES	EALS03 D5SW740 .IES	EALS03 D5SW750 .IES
	F5	Symmetric Wide (SW)	14700	15100	101	B3-U0-G2	B3-U0-G2	EALS03 F5SW730 .IES	EALS03 F5SW740 .IES	EALS03 F5SW750 .IES
	H5	Symmetric Wide (SW)	19700	20200	140	B4-U0-G2	B4-U0-G2	EALS03 H5SW730 .IES	EALS03 H5SW740 .IES	EALS03 H5SW750 .IES
	J5	Symmetric Wide (SW)	24600	25200	186	B4-U0-G2	B4-U0-G2	EALS03 J5SW730 .IES	EALS03 J5SW740 .IES	EALS03 J5SW750 .IES
	K5	Symmetric Wide (SW)	29600	30300	239	B5-U0-G2	B5-U0-G2	EALS03 K5SW730 .IES	EALS03 K5SW740 .IES	EALS03 K5SW750 .IES
	C5	Symmetric High Angle (SH)	7000	7200	46	B3-U0-G1	B3-U0-G1	EALS03 C5SH730 .IES	EALS03 C5SH740 .IES	EALS03 C5SH750 .IES
	D5	Symmetric High Angle (SH)	9400	9600	64	B3-U0-G2	B3-U0-G2	EALS03 D5SH730 .IES	EALS03 D5SH740 .IES	EALS03 D5SH750 .IES
	F5	Symmetric High Angle (SH)	14200	14500	101	B4-U0-G2	B4-U0-G2	EALS03 F5SH730 .IES	EALS03 F5SH740 .IES	EALS03 F5SH750 .IES
H5	Symmetric High Angle (SH)	18900	19300	140	B4-U0-G2	B4-U0-G2	EALS03 H5SH730 .IES	EALS03 H5SH740 .IES	EALS03 H5SH750 .IES	
J5	Symmetric High Angle (SH)	23600	24100	186	B5-U0-G3	B5-U0-G3	EALS03 J5SH730 .IES	EALS03 J5SH740 .IES	EALS03 J5SH750 .IES	
K5	Symmetric High Angle (SH)	28400	29000	239	B5-U0-G3	B5-U0-G3	EALS03 K5SH730 .IES	EALS03 K5SH740 .IES	EALS03 K5SH750 .IES	
Type IV	C4	Asymmetric Forward (AF)	7300	7500	50	B1-U0-G2	B1-U0-G2	EALS03 C4AF730 .IES	EALS03 C4AF740 .IES	EALS03 C4AF750 .IES
	D4	Asymmetric Forward (AF)	9800	10000	70	B2-U0-G2	B2-U0-G2	EALS03 D4AF730 .IES	EALS03 D4AF740 .IES	EALS03 D4AF750 .IES
	F4	Asymmetric Forward (AF)	14700	15000	116	B2-U0-G2	B2-U0-G2	EALS03 F4AF730 .IES	EALS03 F4AF740 .IES	EALS03 F4AF750 .IES
	H4	Asymmetric Forward (AF)	19600	20000	140	B3-U0-G3	B3-U0-G3	EALS03 H4AF730 .IES	EALS03 H4AF740 .IES	EALS03 H4AF750 .IES
	J4	Asymmetric Forward (AF)	24500	25000	186	B3-U0-G3	B3-U0-G3	EALS03 J4AF730 .IES	EALS03 J4AF740 .IES	EALS03 J4AF750 .IES
	K4	Asymmetric Forward (AF)	29400	30000	239	B3-U0-G4	B3-U0-G4	EALS03 K4AF730 .IES	EALS03 K4AF740 .IES	EALS03 K4AF750 .IES
	C4	Asymmetric High Angle (AH)	7000	7200	50	B2-U0-G2	B2-U0-G2	EALS03 C4AH730 .IES	EALS03 C4AH740 .IES	EALS03 C4AH750 .IES
	D4	Asymmetric High Angle (AH)	9400	9600	70	B2-U0-G2	B2-U0-G2	EALS03 D4AH730 .IES	EALS03 D4AH740 .IES	EALS03 D4AH750 .IES
	F4	Asymmetric High Angle (AH)	14200	14500	116	B3-U0-G3	B3-U0-G3	EALS03 F4AH730 .IES	EALS03 F4AH740 .IES	EALS03 F4AH750 .IES
	H4	Asymmetric High Angle (AH)	18900	19300	140	B3-U0-G3	B3-U0-G4	EALS03 H4AH730 .IES	EALS03 H4AH740 .IES	EALS03 H4AH750 .IES
J4	Asymmetric High Angle (AH)	23600	24100	186	B3-U0-G4	B3-U0-G4	EALS03 J4AH730 .IES	EALS03 J4AH740 .IES	EALS03 J4AH750 .IES	
K4	Asymmetric High Angle (AH)	28400	29000	239	B3-U0-G4	B3-U0-G4	EALS03 K4AH730 .IES	EALS03 K4AH740 .IES	EALS03 K4AH750 .IES	
Type III	C3	Asymmetric Wide (AW)	7300	7500	50	B2-U0-G1	B2-U0-G1	EALS03 C3AW730 .IES	EALS03 C3AW740 .IES	EALS03 C3AW750 .IES
	D3	Asymmetric Wide (AW)	9800	10100	70	B2-U0-G2	B2-U0-G2	EALS03 D3AW730 .IES	EALS03 D3AW740 .IES	EALS03 D3AW750 .IES
	F3	Asymmetric Wide (AW)	14700	15100	116	B2-U0-G2	B2-U0-G2	EALS03 F3AW730 .IES	EALS03 F3AW740 .IES	EALS03 F3AW750 .IES
	H3	Asymmetric Wide (AW)	19700	20200	140	B3-U0-G2	B3-U0-G3	EALS03 H3AW730 .IES	EALS03 H3AW740 .IES	EALS03 H3AW750 .IES
	J3	Asymmetric Wide (AW)	24600	25200	186	B3-U0-G3	B3-U0-G3	EALS03 J3AW730 .IES	EALS03 J3AW740 .IES	EALS03 J3AW750 .IES
K3	Asymmetric Wide (AW)	29600	30300	239	B3-U0-G3	B3-U0-G3	EALS03 K3AW730 .IES	EALS03 K3AW740 .IES	EALS03 K3AW750 .IES	
Type II	C2	Asymmetric Narrow/Auto (AN)	7300	7500	50	B2-U0-G2	B2-U0-G2	EALS03 C2AN730 .IES	EALS03 C2AN740 .IES	EALS03 C2AN750 .IES
	C3	Asymmetric Narrow/Auto (AN)	9800	10100	70	B2-U0-G2	B2-U0-G2	EALS03 D2AN730 .IES	EALS03 D2AN740 .IES	EALS03 D2AN750 .IES
	F2	Asymmetric Narrow/Auto (AN)	14700	15100	116	B3-U0-G3	B3-U0-G3	EALS03 F2AN730 .IES	EALS03 F2AN740 .IES	EALS03 F2AN750 .IES
	H2	Asymmetric Narrow/Auto (AN)	19700	20200	140	B3-U0-G3	B3-U0-G3	EALS03 H2AN730 .IES	EALS03 H2AN740 .IES	EALS03 H2AN750 .IES
	J2	Asymmetric Narrow/Auto (AN)	24600	25200	186	B3-U0-G3	B3-U0-G3	EALS03 J2AN730 .IES	EALS03 J2AN740 .IES	EALS03 J2AN750 .IES
K2	Asymmetric Narrow/Auto (AN)	29600	30300	239	B3-U0-G3	B3-U0-G3	EALS03 K2AN730 .IES	EALS03 K2AN740 .IES	EALS03 K2AN750 .IES	

Photometrics

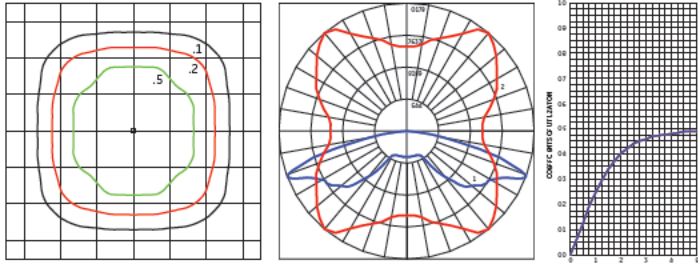
Evolve™ LED Area Light (EALS-03)

EALS Type II - Asymmetric Narrow/Auto
30,300 Lumens, 5000K (EALS03_K2AN750__IES)



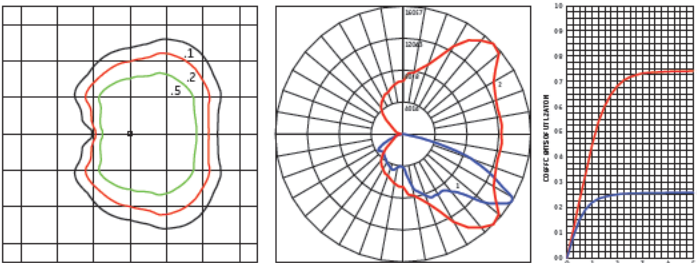
Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade
— Vertical plane through horizontal angle of maximum candlepower at 55°
— Vertical plane through horizontal angle of 34°

EALS Type VS - Symmetric High Angle
29,000 Lumens, 5000K (EALS03_K5SH750__IES)



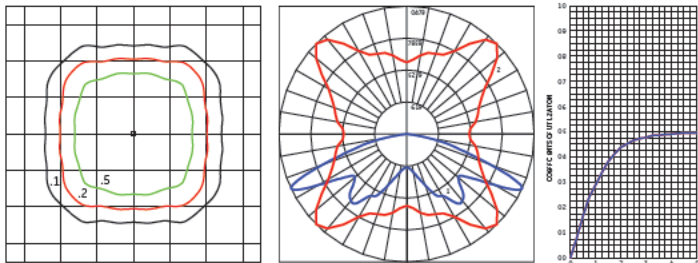
Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade
— Vertical plane through horizontal angle of maximum candlepower at 50°
— Vertical plane through horizontal angle of 69°

EALS Type III - Asymmetric Wide
30,300 Lumens, 5000K (EALS03_K3AW750__IES)



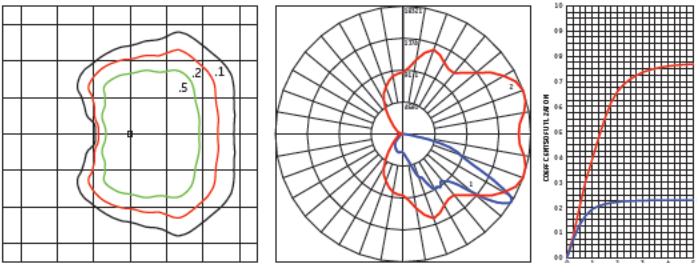
Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade
— Vertical plane through horizontal angle of maximum candlepower at 45°
— Vertical plane through horizontal angle of 58°

EALS Type VS - Symmetric Medium
30,000 Lumens, 5000K (EALS03_K5SM750__IES)



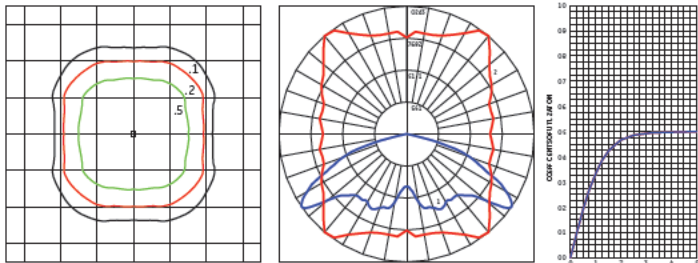
Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade
— Vertical plane through horizontal angle of maximum candlepower at 45°
— Vertical plane through horizontal angle of 65°

EALS Type IV - Asymmetric Forward
30,000 Lumens, 5000K (EALS03_K4AF750__IES)



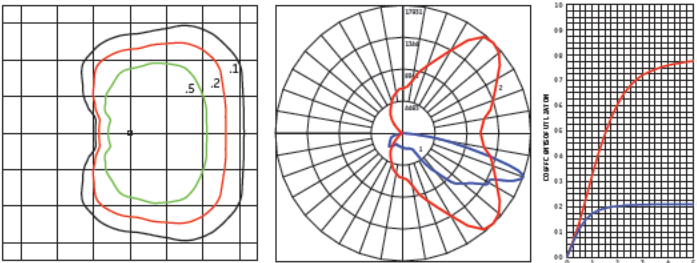
Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade
— Vertical plane through horizontal angle of maximum candlepower at 20°
— Vertical plane through horizontal angle of 58°

EALS Type VS - Symmetric Wide
30,300 Lumens, 5000K (EALS03_K5SW750__IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade
— Vertical plane through horizontal angle of maximum candlepower at 50°
— Vertical plane through horizontal angle of 55°

EALS Type IV - Asymmetric High Angle
29,000 Lumens, 5000K (EALS03_K4AH750__IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade
— Vertical plane through horizontal angle of maximum candlepower at 45°
— Vertical plane through horizontal angle of 70°

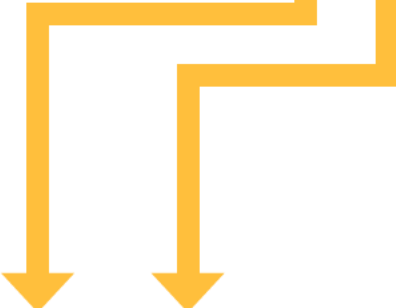


Ordering Number Logic

Evolve™ LED Area Light (EALP-03)

EALP 03 _____ 7 _____

PROD. ID	GENERATION	VOLTAGE	OPTICAL DISTRIBUTION CODE	CRI	CCT	DIMMING	CONTROLS	MOUNTING ARM	COLOR	OPTIONS
E = Evolve AL = Area Light P = Premium	03 = 3rd Generation	0 = 120-277* 1 = 120 2 = 208 3 = 240 4 = 277 5 = 480 D = 347 H = 347-480* *Not available with Fusing. Must choose a discreet voltage with F Option	SM = Symmetric Medium SW = Symmetric Wide SH = Symmetric High Angle AF = Asymmetric Forward AH = Asymmetric High Angle AW = Asymmetric Wide AN = Asymmetric Narrow/Auto	7 = 70 (min)	30 = 3000K 40 = 4000K 50 = 5000K	N = Dimming thru PE receptacle D = External Dimming 18/2-3ft cable X = Non-dimmable* All constructions supplied with ANSI C136.41 7-pin Receptacle *Required for Cx Optical Codes. Not available for other optical codes. Note: Standard dimming 0-10V	A = ANSI 7-pin PE receptacle (no control) D = ANSI 7-pin PE receptacle with shorting cap provided Note: See accessories section on page 7 for PE Control ordering	C1 = Integral Slip-fitter 2" Pipe (2.378 in. OD)* D1 = Universal Mounting Arm, fitted for round or square pole mounting** K1 = Knuckle Slipfitter for 1.9 in - 2.3in. OD Tenon*** S1 = Knuckle Slipfitter for 2.3in. - 3.0in OD Tenon*** V1 = Knuckle Wall Mount*** * Supplied with leads ** Supplied with 16/3 ft cable *** Restricted Aiming Angle 0° to +45°	GRAY = Gray BLCK = Black DKBZ = Dark Bronze WHITE = White	F = Fusing H = Motion Sensor (Sensor Switch) H2 = Motion Sensor (Daintree) J = cUL/Canada L = Tool-Less Entry R = Enhanced Surge Protection (10kV/5kA) S1 = Rotated Left † S2 = Rotated Right † U = DALI dimming ^+ V = 3-Position Terminal Block Y = Coastal Finish XXX = Special Options * Contact Manufacturer for availability + Compatible with LightGrid 2.0 nodes ^ Not compatible at 347-480V with motion sensor controls or above 400W † For aimed left or right light distribution orientation as assembled in manufacturing Not applicable for Symmetric Distributors Note: H option not available for 470W and above configurations Note: H2 option not available at 370V-480V



TYPE	OPTICAL CODE	DISTRIBUTION	TYPICAL INITIAL LUMENS		TYPICAL SYSTEM WATTAGE	BUG RATING		IES FILE NUMBER		
			3000K	4000K & 5000K	120-277V & 347-480V	3000K B-U-G	4000 & 5000K B-U-G	3000K	4000K	5000K
Type V	J5	Symmetric Medium (SM)	23600	25000	172	B4-U0-G2	B4-U0-G2	EALP03_J5SM730_IES	EALP03_J5SM740_IES	EALP03_J5SM750_IES
	K5	Symmetric Medium (SM)	28300	30000	212	B5-U0-G3	B5-U0-G3	EALP03_K5SM730_IES	EALP03_K5SM740_IES	EALP03_K5SM750_IES
	L5	Symmetric Medium (SM)	33000	35000	263	B5-U0-G3	B5-U0-G3	EALP03_L5SM730_IES	EALP03_L5SM740_IES	EALP03_L5SM750_IES
	M5	Symmetric Medium (SM)	37800	40000	305	B5-U0-G3	B5-U0-G4	EALP03_M5SM730_IES	EALP03_M5SM740_IES	EALP03_M5SM750_IES
	N5	Symmetric Medium (SM)	47200	50000	400	B5-U0-G4	B5-U0-G4	EALP03_N5SM730_IES	EALP03_N5SM740_IES	EALP03_N5SM750_IES
	P5	Symmetric Medium (SM)	56700	60000	470	B5-U0-G4	B5-U0-G4	EALP03_P5SM730_IES	EALP03_P5SM740_IES	EALP03_P5SM750_IES
	Q5	Symmetric Medium (SM)	66100	70000	570	B5-U0-G5	B5-U0-G5	EALP03_Q5SM730_IES	EALP03_Q5SM740_IES	EALP03_Q5SM750_IES
	J5	Symmetric Wide (SW)	23600	25000	172	B4-U0-G2	B4-U0-G2	EALP03_J5SW730_IES	EALP03_J5SW740_IES	EALP03_J5SW750_IES
	K5	Symmetric Wide (SW)	28300	30000	212	B5-U0-G2	B5-U0-G2	EALP03_K5SW730_IES	EALP03_K5SW740_IES	EALP03_K5SW750_IES
	L5	Symmetric Wide (SW)	33000	35000	263	B5-U0-G2	B5-U0-G2	EALP03_L5SW730_IES	EALP03_L5SW740_IES	EALP03_L5SW750_IES
	M5	Symmetric Wide (SW)	37800	40000	305	B5-U0-G2	B5-U0-G2	EALP03_M5SW730_IES	EALP03_M5SW740_IES	EALP03_M5SW750_IES
	N5	Symmetric Wide (SW)	47200	50000	400	B5-U0-G3	B5-U0-G3	EALP03_N5SW730_IES	EALP03_N5SW740_IES	EALP03_N5SW750_IES
	P5	Symmetric Wide (SW)	56700	60000	470	B5-U0-G3	B5-U0-G3	EALP03_P5SW730_IES	EALP03_P5SW740_IES	EALP03_P5SW750_IES
	Q5	Symmetric Wide (SW)	66100	70000	570	B5-U0-G4	B5-U0-G4	EALP03_Q5SW730_IES	EALP03_Q5SW740_IES	EALP03_Q5SW750_IES
	J5	Symmetric High Angle (SH)	22700	24100	172	B5-U0-G3	B5-U0-G3	EALP03_J5SH730_IES	EALP03_J5SH740_IES	EALP03_J5SH750_IES
	K5	Symmetric High Angle (SH)	27400	29000	212	B5-U0-G3	B5-U0-G3	EALP03_K5SH730_IES	EALP03_K5SH740_IES	EALP03_K5SH750_IES
	L5	Symmetric High Angle (SH)	31900	33800	263	B5-U0-G4	B5-U0-G4	EALP03_L5SH730_IES	EALP03_L5SH740_IES	EALP03_L5SH750_IES
	M5	Symmetric High Angle (SH)	36400	38600	305	B5-U0-G4	B5-U0-G4	EALP03_M5SH730_IES	EALP03_M5SH740_IES	EALP03_M5SH750_IES
	N5	Symmetric High Angle (SH)	45600	48300	400	B5-U0-G4	B5-U0-G5	EALP03_N5SH730_IES	EALP03_N5SH740_IES	EALP03_N5SH750_IES
	P5	Symmetric High Angle (SH)	54800	58000	470	B5-U0-G5	B5-U0-G5	EALP03_P5SH730_IES	EALP03_P5SH740_IES	EALP03_P5SH750_IES
Q5	Symmetric High Angle (SH)	63800	67600	570	B5-U0-G5	B5-U0-G5	EALP03_Q5SH730_IES	EALP03_Q5SH740_IES	EALP03_Q5SH750_IES	

Type IV, Type III and Type II Claims Table for EALP-03 continued on Page 6

Ordering Number Logic

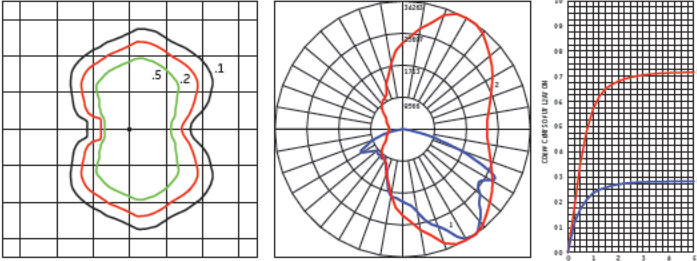
Evolve™ LED Area Light (EALP-03)

TYPE	OPTICAL CODE	DISTRIBUTION	TYPICAL INITIAL LUMENS		TYPICAL SYSTEM WATTAGE	BUG RATING		IES FILE NUMBER	IES FILE NUMBER	IES FILE NUMBER
			3000K	4000K & 5000K	120-277V & 347-480V	3000K B-U-G	4000 & 5000K B-U-G	3000K	4000K	5000K
Type IV	J4	Asymmetric Forward (AF)	23600	25000	200	B3-U0-G3	B3-U0-G4	EALP03_J4AF730_IES	EALP03_J4AF740_IES	EALP03_J4AF750_IES
	K4	Asymmetric Forward (AF)	28300	30000	212	B3-U0-G4	B3-U0-G4	EALP03_K4AF730_IES	EALP03_K4AF740_IES	EALP03_K4AF750_IES
	L4	Asymmetric Forward (AF)	33000	35000	263	B3-U0-G4	B3-U0-G4	EALP03_L4AF730_IES	EALP03_L4AF740_IES	EALP03_L4AF750_IES
	M4	Asymmetric Forward (AF)	37800	40000	305	B4-U0-G4	B4-U0-G5	EALP03_M4AF730_IES	EALP03_M4AF740_IES	EALP03_M4AF750_IES
	N4	Asymmetric Forward (AF)	47200	50000	400	B4-U0-G5	B4-U0-G5	EALP03_N4AF730_IES	EALP03_N4AF740_IES	EALP03_N4AF750_IES
	P4	Asymmetric Forward (AF)	56700	60000	470	B4-U0-G5	B4-U0-G5	EALP03_P4AF730_IES	EALP03_P4AF740_IES	EALP03_P4AF750_IES
	Q4	Asymmetric Forward (AF)	66100	70000	570	B4-U0-G5	B4-U0-G5	EALP03_Q4AF730_IES	EALP03_Q4AF740_IES	EALP03_Q4AF750_IES
	J4	Asymmetric High Angle (AH)	22700	24100	200	B3-U0-G4	B3-U0-G4	EALP03_J4AH730_IES	EALP03_J4AH740_IES	EALP03_J4AH750_IES
	K4	Asymmetric High Angle (AH)	27400	29000	212	B3-U0-G4	B3-U0-G5	EALP03_K4AH730_IES	EALP03_K4AH740_IES	EALP03_K4AH750_IES
	L4	Asymmetric High Angle (AH)	31900	33800	263	B4-U0-G5	B4-U0-G5	EALP03_L4AH730_IES	EALP03_L4AH740_IES	EALP03_L4AH750_IES
	M4	Asymmetric High Angle (AH)	36400	38600	305	B4-U0-G5	B4-U0-G5	EALP03_M4AH730_IES	EALP03_M4AH740_IES	EALP03_M4AH750_IES
	N4	Asymmetric High Angle (AH)	45600	48300	400	B4-U0-G5	B4-U0-G5	EALP03_N4AH730_IES	EALP03_N4AH740_IES	EALP03_N4AH750_IES
P4	Asymmetric High Angle (AH)	54800	58000	470	B4-U0-G5	B4-U0-G5	EALP03_P4AH730_IES	EALP03_P4AH740_IES	EALP03_P4AH750_IES	
Q4	Asymmetric High Angle (AH)	63800	67600	570	B5-U0-G5	B5-U0-G5	EALP03_Q4AH730_IES	EALP03_Q4AH740_IES	EALP03_Q4AH750_IES	
Type III	J3	Asymmetric Wide (AW)	23600	25000	200	B3-U0-G3	B3-U0-G3	EALP03_J3AW730_IES	EALP03_J3AW740_IES	EALP03_J3AW750_IES
	K3	Asymmetric Wide (AW)	28300	30000	212	B3-U0-G3	B3-U0-G3	EALP03_K3AW730_IES	EALP03_K3AW740_IES	EALP03_K3AW750_IES
	L3	Asymmetric Wide (AW)	33000	35000	263	B3-U0-G3	B4-U0-G3	EALP03_L3AW730_IES	EALP03_L3AW740_IES	EALP03_L3AW750_IES
	M3	Asymmetric Wide (AW)	37800	40000	305	B4-U0-G3	B4-U0-G4	EALP03_M3AW730_IES	EALP03_M3AW740_IES	EALP03_M3AW750_IES
	N3	Asymmetric Wide (AW)	47200	50000	400	B4-U0-G4	B4-U0-G4	EALP03_N3AW730_IES	EALP03_N3AW740_IES	EALP03_N3AW750_IES
	P3	Asymmetric Wide (AW)	56700	60000	470	B5-U0-G4	B5-U0-G4	EALP03_P3AW730_IES	EALP03_P3AW740_IES	EALP03_P3AW750_IES
	Q3	Asymmetric Wide (AW)	66100	70000	570	B5-U0-G5	B5-U0-G5	EALP03_Q3AW730_IES	EALP03_Q3AW740_IES	EALP03_Q3AW750_IES
Type II	J2	Asymmetric Narrow/Auto (AN)	23800	25200	200	B3-U0-G3	B3-U0-G3	EALP03_J2AN730_IES	EALP03_J2AN740_IES	EALP03_J2AN750_IES
	K2	Asymmetric Narrow/Auto (AN)	28600	30300	212	B3-U0-G3	B3-U0-G3	EALP03_K2AN730_IES	EALP03_K2AN740_IES	EALP03_K2AN750_IES
	L2	Asymmetric Narrow/Auto (AN)	33300	35300	263	B4-U0-G4	B4-U0-G4	EALP03_L2AN730_IES	EALP03_L2AN740_IES	EALP03_L2AN750_IES
	M2	Asymmetric Narrow/Auto (AN)	38100	40400	305	B4-U0-G4	B4-U0-G4	EALP03_M2AN730_IES	EALP03_M2AN740_IES	EALP03_M2AN750_IES
	N2	Asymmetric Narrow/Auto (AN)	47700	50500	400	B4-U0-G4	B4-U0-G4	EALP03_N2AN730_IES	EALP03_N2AN740_IES	EALP03_N2AN750_IES
	P2	Asymmetric Narrow/Auto (AN)	57200	60600	470	B4-U0-G4	B4-U0-G4	EALP03_P2AN730_IES	EALP03_P2AN740_IES	EALP03_P2AN750_IES
	Q2	Asymmetric Narrow/Auto (AN)	66800	70700	570	B5-U0-G5	B5-U0-G5	EALP03_Q2AN730_IES	EALP03_Q2AN740_IES	EALP03_Q2AN750_IES

Photometrics

Evolve™ LED Area Light (EALP-03)

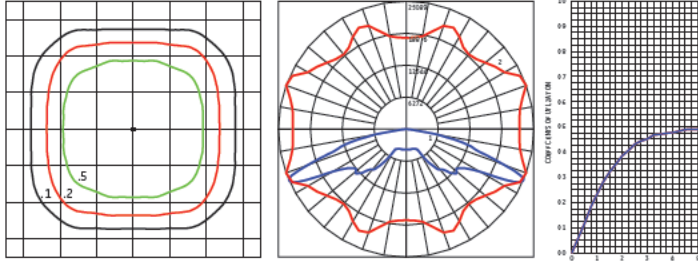
EALP Type II - Asymmetric Narrow/Auto
70,700 Lumens, 5000K (EALP03_Q2AN750__IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 60°
— Vertical plane through horizontal angle of 35°

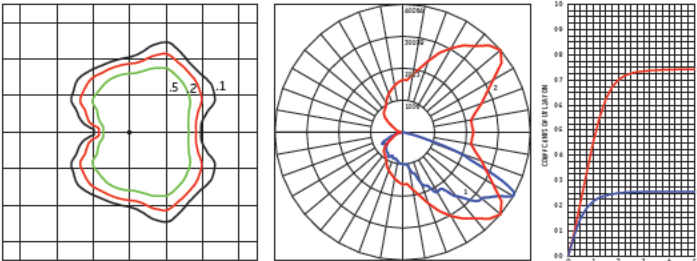
EALP Type VS - Symmetric High Angle
67,600 Lumens, 5000K (EALP03_Q5SH750__IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 20°
— Vertical plane through horizontal angle of 66°

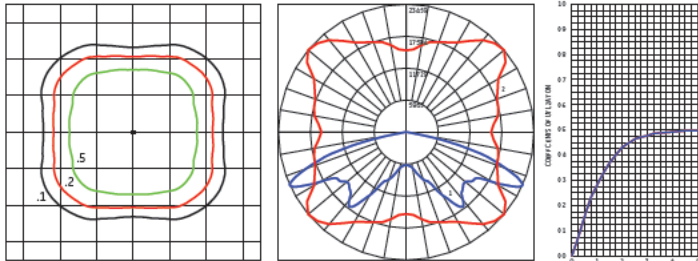
EALP Type III - Asymmetric Wide
70,000 Lumens, 5000K (EALP03_Q3AW750__IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 40°
— Vertical plane through horizontal angle of 61°

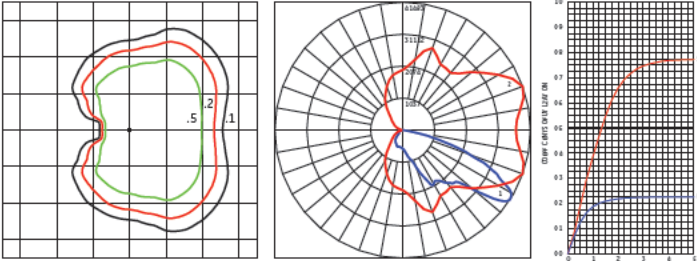
EALP Type VS - Symmetric Medium
70,000 Lumens, 5000K (EALP03_Q5SM750__IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 40°
— Vertical plane through horizontal angle of 65°

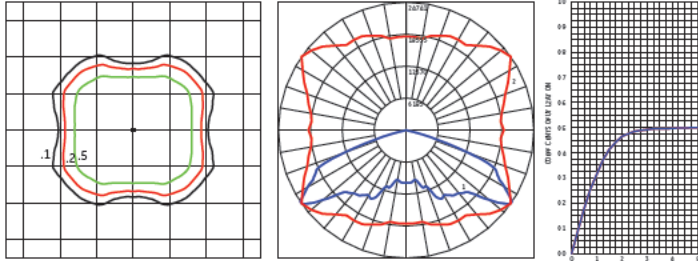
EALP Type IV - Asymmetric Forward
70,000 Lumens, 5000K (EALP03_Q4AF750__IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 20°
— Vertical plane through horizontal angle of 57°

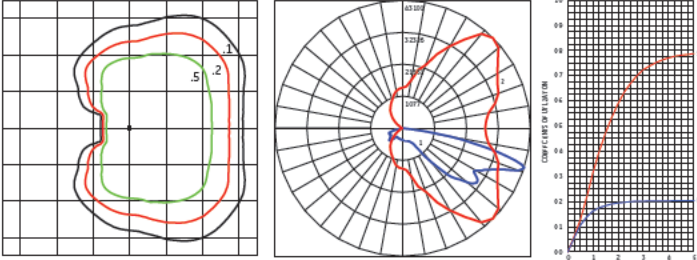
EALP Type VS - Symmetric Wide
70,000 Lumens, 5000K (EALP03_Q5SW750__IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 35°
— Vertical plane through horizontal angle of 56°

EALP Type IV - Asymmetric High Angle
67,700 Lumens, 5000K (EALP03_Q4AH750__IES)



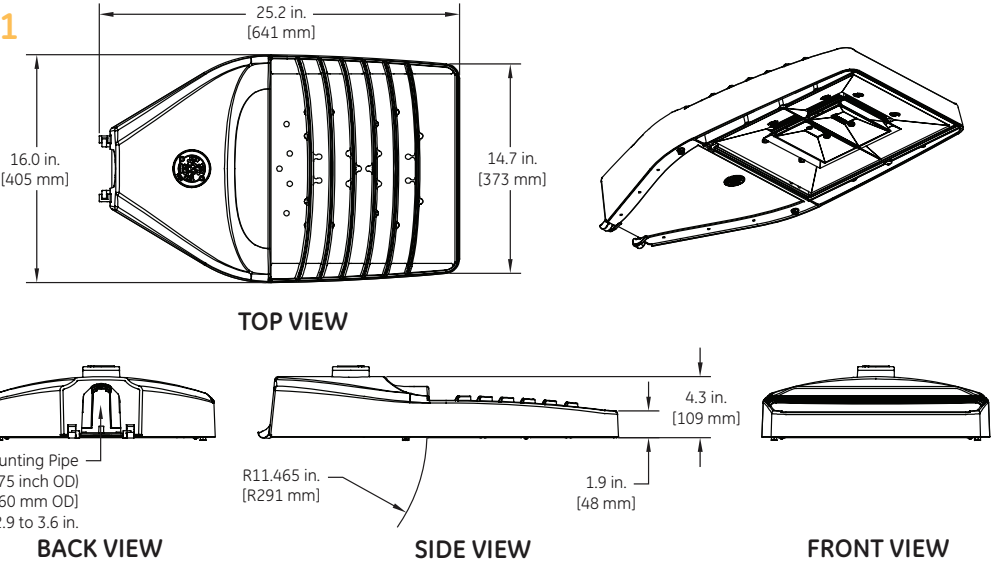
Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 45°
— Vertical plane through horizontal angle of 72°

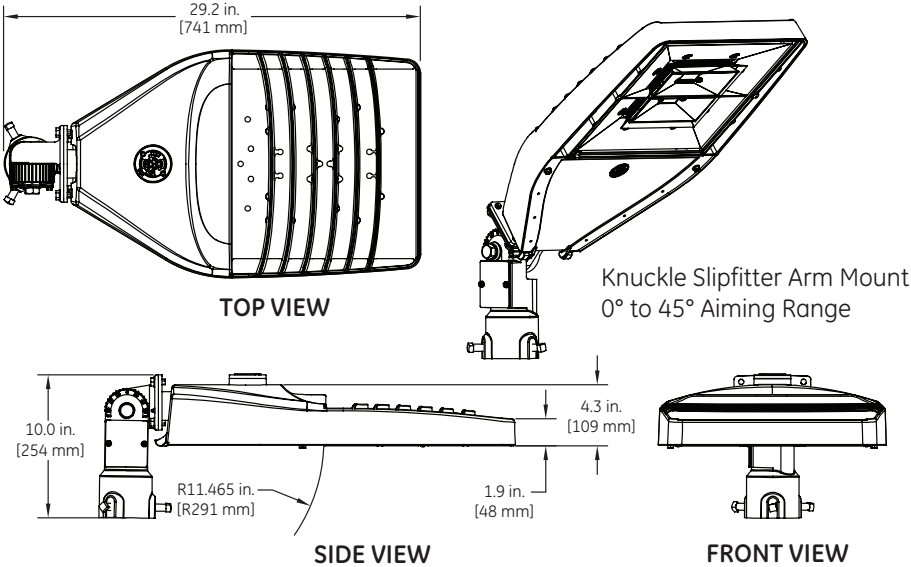
Product Dimensions

Evolve™ LED Area Light (EALS-03 & EALP-03)

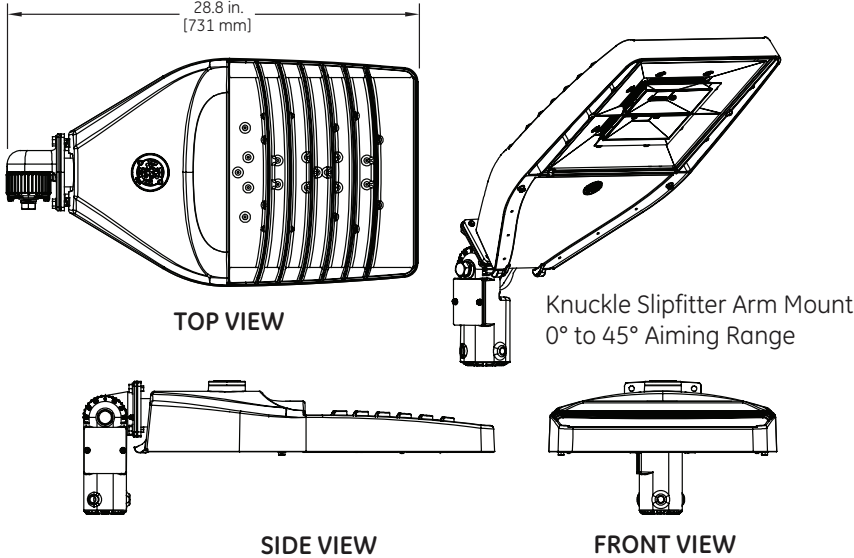
Integral Slipfitter: C1



Knuckle Slipfitter: S1



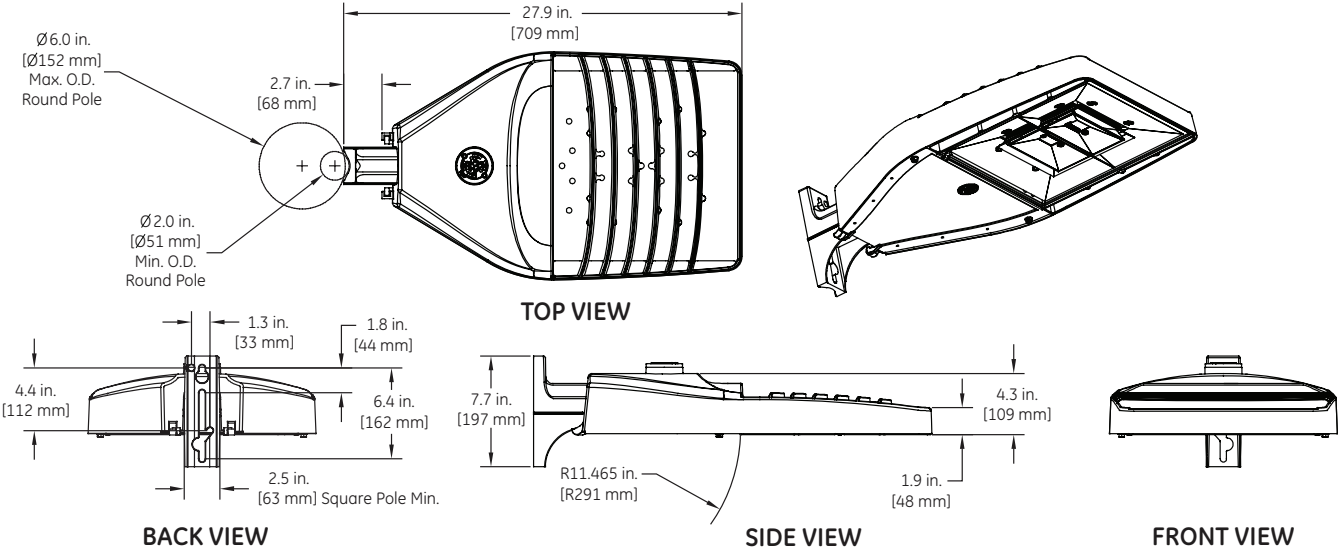
Knuckle Slipfitter: K1



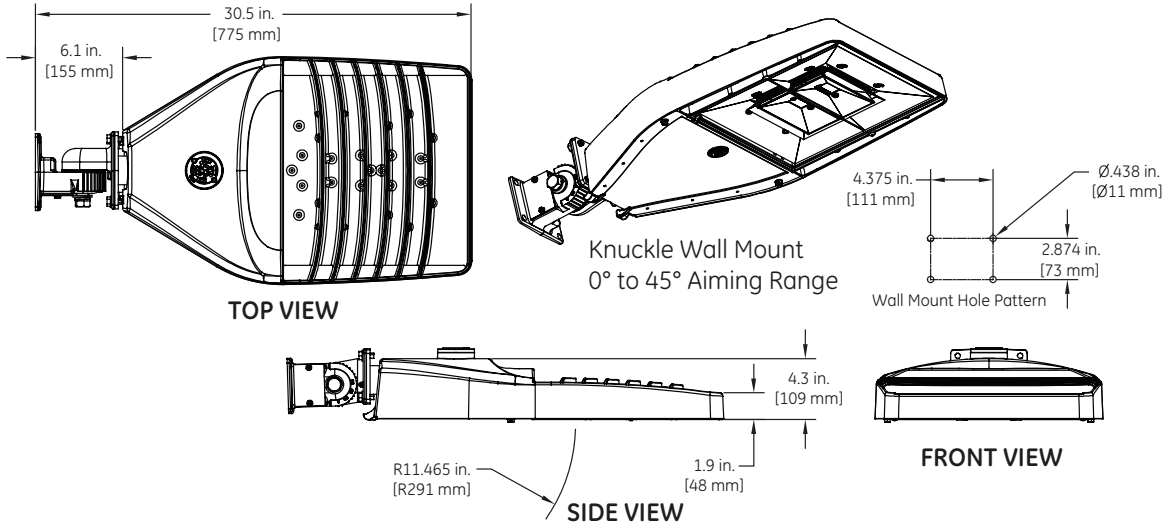
Product Dimensions

Evolve™ LED Area Light (EALS-03 & EALP-03)

Universal Mounting Arm: D1



Knuckle Wall Mount: V1



DATA

- Weight: PM request of ≤ 35 lbs (max not including occ sensor option)
- Effective Projected Area:
 - Knuckle Slipfitter S1, K1 45° aim, EPA = 2.45
 - Knuckle Slipfitter S1, K1 downward aim, EPA = 0.73
 - Universal Arm Mount D1, EPA = 0.54 - Knuckle Wall Mount V1, 45° aim, EPA = 0.77 sq ft min and 1.43 sq ft max
 - Integral Slipfitter C1, EPA = 0.63

Accessories

Evolve™ LED Area Light (EALS-03 & EALP-03)

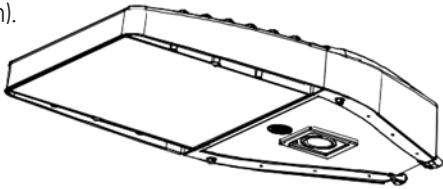
PE Accessories (to be ordered separately)

SAP Number	Part Number	Description
93029237	PED-MV-LED-7	ANSI C136.41 Dimming PE, 120-277V
93029238	PED-347-LED-7	ANSI C136.41 Dimming PE, 347V
93029239	PED-480-LED-7	ANSI C136.41 Dimming PE, 480V

SAP Number	Part Number	Description
28299	PEC0TL	STANDARD 120-277V
28294	PEC5TL	STANDARD 480V
80436	PECDTL	STANDARD 347V
73251	SCCL-PECTL	Shorting cap

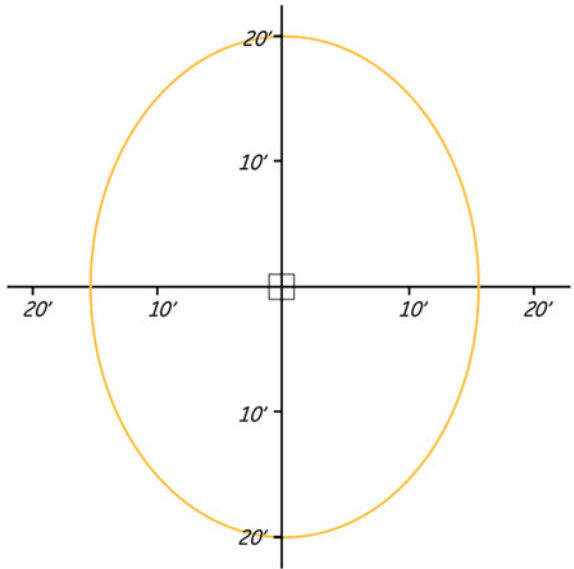
H-Motion Sensing Option

- Intended for applications, between 15-30 ft. mounting height. (4.57-9.14m). For mounting heights exceeding 30 ft., pole mounted sensors are recommended.
- Provides a coverage area radius for walking motion of 15-20 ft. (4.57-6.10m).
- Provides 270° of coverage (~90° is blocked by the pole).
- Standard factory settings:
 - 50% output when unoccupied, 100% output occupied.
 - Integral PE Sensor.
 - 5 minute post-occupancy time delay, 5 minute dimming ramp-down.
- Fixture power increase of 1W expected with sensor use.



Note: Standard options may be reprogrammed in the field. Reprogramming instructions included in product shipment.

Sensor Pattern



**Sensing Pattern Area Fixture
Up to 30 ft. Mounting Height**

Mounting Information

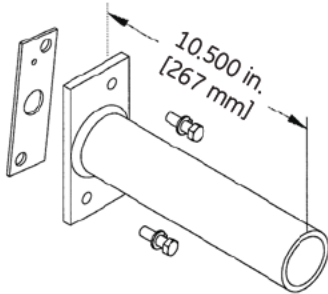
Evolve™ LED Area Light (EALS-03 & EALP-03)

Mounting Options for Integral Slipfitter - (Mounting Arm C1)

Order separately

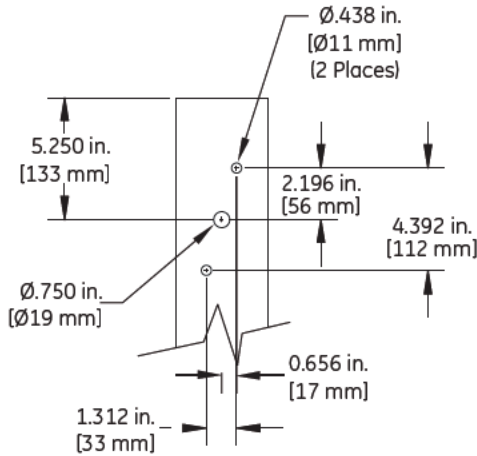
SQUARE POLE MOUNTING ARM

3.5 TO 4.5-inch (89 to 114mm) SQUARE
(WILL ALLOW 4 FIXTURES PER POLE @ 90 DEGREES.)



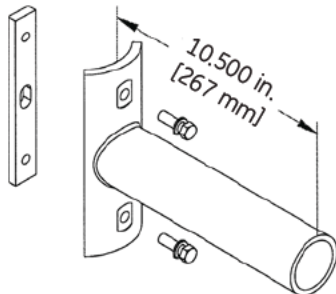
ORDER SEPARATELY FROM FIXTURE AS CATALOG NUMBER
SPA-EAMT10BLCK "Black"
SPA-EAMT10DKBZ "Dark Bronze"
SPA-EAMT10WHTA "White"
SPA-EAMT10GRAY "Gray"

SQUARE POLE MOUNTING DRILLING TEMPLATE



ROUND POLE MOUNTING ARM DRILLING TEMPLATE

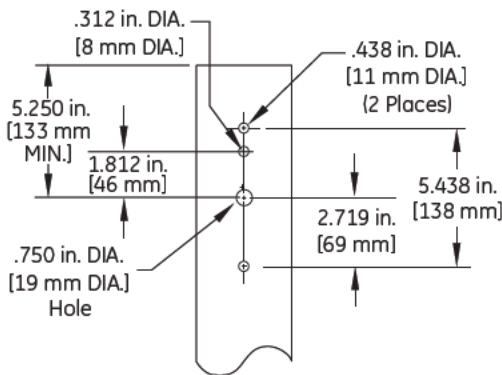
3.5 TO 4.5-inch (89 to 114mm) OD
(WILL ALLOW 4 FIXTURES PER POLE @ 90 DEGREES.)



ORDER SEPARATELY FROM FIXTURE AS CATALOG NUMBER
RPA-EAMT10BLCK "Black"
RPA-EAMT10DKBZ "Dark Bronze"
RPA-EAMT10WHTA "White"
RPA-EAMT10GRAY "Gray"

ROUND POLE MOUNTING DRILLING TEMPLATE

3.5 TO 4.5-inch (89 to 114mm) OD
round pole mounting arm



Wall Mounting Bracket Adapter Plate

ORDER SEPARATELY FROM FIXTURE AS CATALOG NUMBER
WMB-EAMT06

*NOTE: For Wall Mounting, order luminaire with mounting arm: C1 = Slipfitter 2" Pipe (2.378 in. OD) supplied with leads.

Other mounting patterns are available for retrofit installations.
Contact manufacturing for other available mounting patterns.



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RSX2 LED Area Luminaire

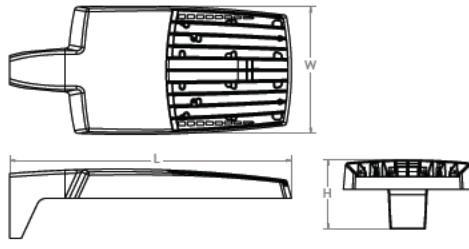


Catalog Number	REDACTED – Matter No. 21-00750
Notes	
Type	

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

EPA (ft ² @0°):	0.69 ft ² (0.06 m ²)
Length:	29.3" (74.4 cm) (SPA mount)
Width:	13.4" (34.0 cm)
Height:	3.0" (7.6 cm) Main Body 7.2" (18.3 cm) Arm
Weight: (SPA mount)	30.0 lbs (13.6 kg)



Introduction

The new RSX LED Area family delivers maximum value by providing significant energy savings, long life and outstanding photometric performance at an affordable price. The RSX2 delivers 11,000 to 31,000 lumens allowing it to replace 250W to 1000W HID luminaires.

The RSX features an integral universal mounting mechanism that allows the luminaire to be mounted on most existing drill hole patterns. This "no-drill" solution provides significant labor savings. An easy-access door on the bottom of mounting arm allows for wiring without opening the electrical compartment. A mast arm adaptor, adjustable integral slipfitter and other mounting configurations are available.

Ordering Information

EXAMPLE: RSX2 LED P6 40K R3 MVOLT SPA DDBXD

RSX2 LED					
Series	Performance Package	Color Temperature	Distribution	Voltage	Mounting
RSX2 LED	P1	30K 3000K	R2 Type 2 Wide	MVOLT (120V-277V) ²	SPA Square pole mounting (3.0" min. SQ pole for 1 at 90°, 3.5" min. SQ pole for 2, 3, 4 at 90°)
	P2	40K 4000K	R3 Type 3 Wide	HVOLT (347V-480V) ³	RPA Round pole mounting (3.2" min. dia. RND pole for 2, 3, 4 at 90°, 3.0" min. dia. RND pole for 1 at 90°, 2 at 180°, 3 at 120°)
	P3	50K 5000K	R3S Type 3 Short	XVOLT (277V-480V) ⁴	MA Mast arm adaptor (fits 2-3/8" OD horizontal tenon)
	P4		R4 Type 4 Wide	(use specific voltage for options as noted)	IS Adjustable slipfitter (fits 2-3/8" OD tenon) ⁶
	P5		R4S Type 4 Short		WBA Wall bracket ¹
	P6		R5 Type 5 Wide ¹		WBASC Wall bracket with surface conduit box
			R5 Type 5 Short ¹		AASP Adjustable tilt arm square pole mounting ⁶
			RSS Type 5 Short ¹		AARP Adjustable tilt arm round pole mounting ⁶
			AFR Automotive Front Row		AAWB Adjustable tilt arm with wall bracket ⁶
			AFRR90 Automotive Front Row Right Rotated	AAWSC Adjustable tilt arm wall bracket and surface conduit box ⁶	
			AFRL90 Automotive Front Row Left Rotated		

Options		Finish
Shipped Installed	Shipped Installed	DDBXD Dark Bronze
HS House-side shield ⁷	*Standalone and Networked Sensors/Controls (factory default settings, see table page 9)	DBLXD Black
PE Photocontrol, button style ^{8,9}	NLTAIR2 nLight AIR generation 2 ^{13,15,16}	DNAXD Natural Aluminum
PEX Photocontrol external threaded, adjustable ^{9,10}	PIRHN Networked, Bi-Level motion/ambient sensor (for use with NLTAIR2) ^{13,16,7}	DWHXD White
PER7 Seven-wire twist-lock receptacle only (no controls) ^{9,11,12,13}	BAA Buy America(n) Act Compliant	DBBTXD Textured Dark Bronze
CE34 Conduit entry 3/4" NPT (Qty 2)	*Note: PIRHN with nLight Air can be used as a standalone dimming sensor with out-of-box settings or as a wireless networked solution. See factory default settings table. Sensor coverage pattern is affected when luminaire is tilted.	DBLXD Textured Black
SF Single fuse (120, 277, 347) ⁵	Shipped Separately (requires some field assembly)	DNATXD Textured Natural Aluminum
DF Double fuse (208, 240, 480) ⁵	EGS External glare shield ⁶	DWHGXD Textured White
SPD20KV 20KV Surge pack (10KV standard)	EGFV External glare full visor (360° around light aperture) ⁷	
FAO Field adjustable output ^{9,13}	BS Bird spikes ¹⁸	
DMG 0-10V dimming extend out back of housing for external control (control ordered separate) ^{9,13}		
DS Dual switching ^{9,14}		

Ordering Information

Accessories

Ordered and shipped separately.

RSX2HS	RSX2 House side shield (includes 2 shields)
RSX2EGS (FINISH) U	External glare shield (specify finish)
RSX2HSFRR (FINISH) U	RSX2 House side shields for AFR rotated optics (includes 2 shields)
RSX2EGFV (FINISH) U	External glare full visor (specify finish)
RSXRPA (FINISH) U	RSX Universal round pole adaptor plate (specify finish)
RSXWBA (FINISH) U	RSX WBA wall bracket (specify finish) ¹
RSXSDB (FINISH) U	RSX Surface conduit box (specify finish, for use with WBA, WBA not included)
DLL127F 1.5 JU	Photocell -SSL twist-lock (120-277V) ¹⁹
DLL347F 1.5 CUL JU	Photocell -SSL twist-lock (347V) ¹⁹
DLL480F 1.5 CUL JU	Photocell -SSL twist-lock (480V) ¹⁹
DSHORT SBK U	Shorting cap ¹⁹

NOTES

- Any Type 5 distribution, is not available with WBA.
- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- HVOLT driver operates on any line voltage from 347-480V (50/60 Hz).
- XVOLT driver not available with P1. XVOLT driver operates on any line voltage from 277V-480V (50/60 Hz). XVOLT not available with fusing (SF or DF) and not available with PE or PEX.
- Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
- Maximum tilt is 90° above horizontal.
- It may be ordered as an accessory.
- Requires MVOLT or 347V.
- Not available in combination with other light sensing control options (following options cannot be combined: PE, PEX, PER7, FAO, DMG, DS, PIRHN).
- Requires 120V, 208V, 240V, or 277V.

- Twistlock photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Shorting Cap included. Dimming leads capped for future use.
- For units with option PER7, the mounting must be restricted to +/- 45° from horizontal aim per ANSI C136.10-2010.
- Two or more of the following options cannot be combined including DMG, DS, PER7, FAO and PIRHN.
- DS only available on performance package P5 and P6.
- Must be ordered with PIRHN.
- Requires MVOLT or HVOLT.
- Must be ordered with NLTAIR2. For additional information on PIRHN visit [here](#).
- Must be ordered with fixture for factory pre-drilling.
- Requires luminaire to be specified with PER7 option. Ordered and shipped as a separate line item from Acuity Brands Controls.

External Shields



House Side Shield



External Glare Shield

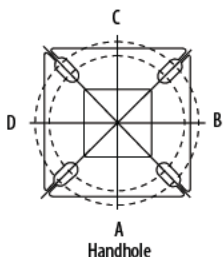


External 360 Full Visor

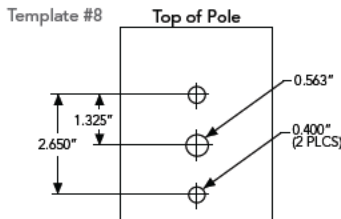
Pole/Mounting Information

Accessories including bullhorns, cross arms and other adapters are available under the accessories tab at Lithonia's Outdoor Poles and Arms product page. Click here to visit [Accessories](#).

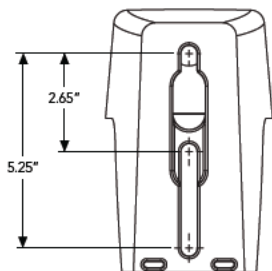
HANDHOLE ORIENTATION



RSX POLE DRILLING



RSX STANDARD ARM & ADJUSTABLE ARM



Round Tenon Mount - Pole Top Slipfitters

Tenon O.D.	RSX Mounting	Single	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2 - 3/8"	RPA, AARP	AS3-5 190	AS3-5 280	AS3-5 290	AS3-5 320	AS3-5 390	AS3-5 490
2 - 7/8"	RPA, AARP	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	RPA, AARP	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

Drill/Side Location by Configuration Type

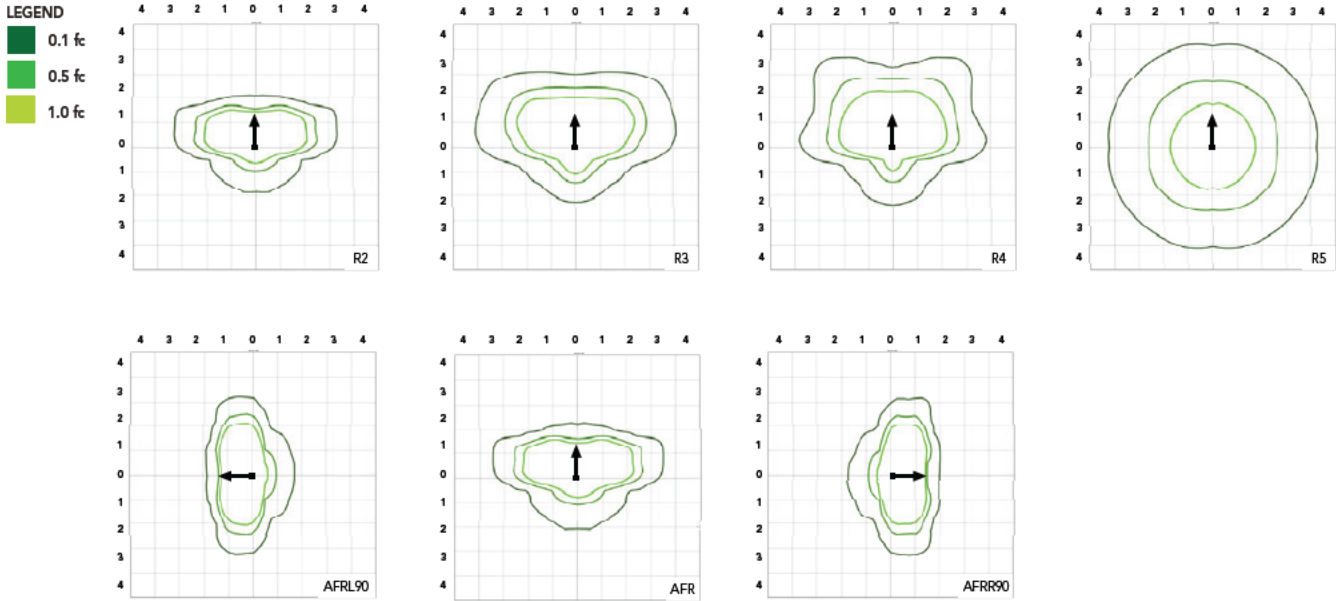
Drilling Template	Mounting Option	Single	2 @ 180	2 @ 90	3 @ 120	3 @ 90	4 @ 90
	Head Location	Side B	Side B & D	Side B & C	Round Pole Only	Side B, C & D	Side A, B, C & D
#8	Drill Nomenclature	DM19AS	DM28AS	DM29AS	DM32AS	DM39AS	DM49AS

RSX2 - Luminaire EPA

*Includes luminaire and integral mounting arm. Other tenons, arms, brackets or other accessories are not included in this EPA data.

Fixture Quantity & Mounting Configuration	Single	2 @ 90	2 @ 180	3 @ 90	3 @ 120	4 @ 90	2 Side by Side	3 Side by Side	4 Side by Side
SPA - Square Pole Adaptor	0.69	1.22	1.27	1.8	1.61	2.39	1.37	2.06	2.74
RPA - Round Pole Adaptor	0.74	1.27	1.37	1.9	1.71	2.49	1.42	2.16	2.84
MA - Mast Arm Adaptor	0.61	1.14	1.11	1.64	1.45	2.23	1.29	1.9	2.58
IS - Integral Slipfitter	0.69	1.22	1.27	1.8	1.61	2.39	1.37	2.06	2.74
AASP/AARP - Adjustable Arm Square/Round Pole	10°	0.53	1.06	1.05	1.58	1.37	2.08	1.06	1.59
	20°	0.52	1.02	1.03	1.52	1.33	2.02	1.03	1.55
	30°	0.64	1.11	1.18	1.63	1.45	2.21	1.27	1.91
	40°	0.81	1.21	1.35	1.74	1.65	2.39	1.62	2.43
	45°	0.91	1.25	1.5	1.81	1.75	2.48	1.82	2.73
	50°	1.34	1.83	2.17	2.61	2.56	3.62	2.68	4.02
	60°	2.2	2.97	3.57	4.24	4.17	5.89	4.41	6.61
	70°	2.86	4.13	4.7	5.89	5.71	8.21	5.71	8.57
	80°	3.4	5.13	5.67	7.34	7.09	10.21	6.79	10.19
	90°	3.85	5.96	6.55	8.58	8.31	11.88	7.70	11.56

Isofootcandle plots for the RSX2 LED P6 40K. Distances are in units of mounting height (30').



Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-50°C (32-122°F).

Ambient	Ambient	Lumen Multiplier
0°C	32°F	1.05
5°C	41°F	1.04
10°C	50°F	1.03
15°C	59°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.97
45°C	113°F	0.96
50°C	122°F	0.95

Electrical Load

Performance Package	System Watts (W)	Current (A)					
		120V	208V	240V	277V	347V	480V
P1	71W	0.59	0.34	0.30	0.26	0.20	0.15
P2	111W	0.93	0.53	0.46	0.40	0.32	0.23
P3	147W	1.23	0.70	0.61	0.53	0.42	0.31
P4	187W	1.55	0.90	0.78	0.68	0.53	0.38
P5	210W	1.75	1.01	0.87	0.76	0.60	0.44
P6	244W	2.03	1.17	1.01	0.88	0.70	0.51

Projected LED Lumen Maintenance

Operating Hours	50,000	75,000	100,000
Lumen Maintenance Factor	>0.97	>0.95	>0.92

Values calculated according to IESNA TM-21-11 methodology and valid up to 40°C.

Lumen Output

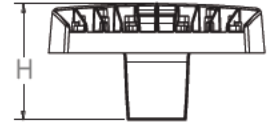
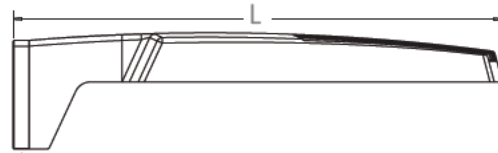
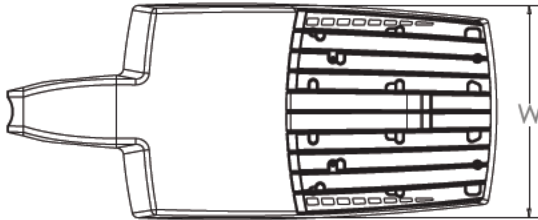
Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Performance Package	System Watts	Distribution Type	30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	71W	R2	10,040	2	0	1	139	11,031	2	0	1	153	11,031	2	0	1	153
		R3	10,005	2	0	2	141	10,992	2	0	2	155	10,992	2	0	2	155
		R35	10,271	2	0	2	143	11,285	2	0	2	157	11,285	2	0	2	157
		R4	10,136	2	0	2	143	11,136	2	0	2	157	11,136	2	0	2	157
		R45	9,779	2	0	2	138	10,744	2	0	2	151	10,744	2	0	2	151
		R5	10,271	4	0	2	145	11,285	4	0	2	159	11,285	4	0	2	159
		R55	10,544	3	0	1	149	11,585	3	0	2	163	11,585	3	0	2	163
		AFR	10,026	2	0	1	141	11,016	2	0	1	155	11,016	2	0	1	155
		AFRR90	10,122	3	0	2	140	11,121	3	0	2	154	11,121	3	0	2	154
		AFRL90	10,164	3	0	2	141	11,167	3	0	2	155	11,167	3	0	2	155
P2	111W	R2	15,712	2	0	2	138	17,263	2	0	2	151	17,263	2	0	2	151
		R3	15,657	2	0	3	141	17,202	3	0	3	155	17,202	3	0	3	155
		R35	16,075	2	0	2	141	17,661	2	0	2	155	17,661	2	0	2	155
		R4	15,862	2	0	3	143	17,427	2	0	3	157	17,427	2	0	3	157
		R45	15,304	2	0	2	138	16,815	2	0	2	151	16,815	2	0	2	151
		R5	16,075	4	0	2	145	17,661	5	0	3	159	17,661	5	0	3	159
		R55	16,502	4	0	2	149	18,130	4	0	2	163	18,130	4	0	2	163
		AFR	15,691	2	0	2	141	17,240	2	0	2	155	17,240	2	0	2	155
		AFRR90	15,841	3	0	3	139	17,404	4	0	3	153	17,404	4	0	3	153
		AFRL90	15,907	3	0	3	139	17,477	4	0	3	153	17,477	4	0	3	153
P3	147W	R2	19,855	3	0	2	132	21,814	3	0	2	145	21,814	3	0	2	145
		R3	19,785	3	0	3	135	21,737	3	0	4	148	21,737	3	0	4	148
		R35	20,312	3	0	3	135	22,317	3	0	3	149	22,317	3	0	3	149
		R4	20,044	3	0	3	136	22,022	3	0	4	150	22,022	3	0	4	150
		R45	19,339	3	0	3	132	21,247	3	0	3	145	21,247	3	0	3	145
		R5	20,313	5	0	3	138	22,317	5	0	3	152	22,317	5	0	3	152
		R55	20,852	4	0	2	142	22,910	4	0	2	156	22,910	4	0	2	156
		AFR	19,828	3	0	2	135	21,785	3	0	2	148	21,785	3	0	2	148
		AFRR90	20,017	4	0	3	133	21,992	4	0	3	147	21,992	4	0	3	147
		AFRL90	20,101	4	0	3	134	22,084	4	0	3	147	22,084	4	0	3	147
P4	187W	R2	22,836	3	0	2	120	25,090	3	0	2	132	25,090	3	0	2	132
		R3	22,756	3	0	4	122	25,002	3	0	4	134	25,002	3	0	4	134
		R35	23,363	3	0	3	123	25,668	3	0	3	135	25,668	3	0	3	135
		R4	23,054	3	0	4	123	25,329	3	0	4	135	25,329	3	0	4	135
		R45	22,243	3	0	3	119	25,059	3	0	3	134	25,059	3	0	3	134
		R5	23,363	5	0	3	125	25,669	5	0	4	137	25,669	5	0	4	137
		R55	23,983	4	0	2	128	26,350	4	0	2	141	26,350	4	0	2	141
		AFR	22,806	3	0	2	122	25,056	3	0	2	134	25,056	3	0	2	134
		AFRR90	23,023	4	0	3	121	25,295	4	0	3	133	25,295	4	0	3	133
		AFRL90	23,120	4	0	3	122	25,401	4	0	3	134	25,401	4	0	3	134
P5	210W	R2	26,141	3	0	2	122	28,721	3	0	2	135	28,721	3	0	2	135
		R3	26,049	3	0	4	124	28,620	3	0	4	136	28,620	3	0	4	136
		R35	26,744	3	0	3	125	29,383	3	0	4	138	29,383	3	0	4	138
		R4	26,390	3	0	4	126	28,994	3	0	4	138	28,994	3	0	4	138
		R45	25,462	3	0	3	121	27,974	3	0	3	133	27,974	3	0	3	133
		R5	26,744	5	0	4	127	29,383	5	0	4	140	29,383	5	0	4	140
		R55	27,454	4	0	2	131	30,163	4	0	2	144	30,163	4	0	2	144
		AFR	26,106	3	0	2	124	28,682	3	0	2	137	28,682	3	0	2	137
		AFRR90	26,354	4	0	3	123	28,955	5	0	3	136	28,955	5	0	3	136
		AFRL90	26,465	4	0	3	124	29,077	5	0	3	136	29,077	5	0	3	136
P6	244W	R2	27,646	3	0	2	112	30,374	3	0	2	123	30,374	3	0	2	123
		R3	27,549	3	0	4	113	30,267	3	0	4	124	30,267	3	0	4	124
		R35	28,283	3	0	3	115	31,075	3	0	4	126	31,075	3	0	4	126
		R4	27,909	3	0	4	114	30,663	3	0	4	126	30,663	3	0	4	126
		R45	26,928	3	0	3	110	29,585	3	0	3	121	29,585	3	0	3	121
		R5	28,284	5	0	4	116	31,075	5	0	4	127	31,075	5	0	4	127
		R55	29,035	4	0	2	119	31,900	5	0	3	131	31,900	5	0	3	131
		AFR	27,608	3	0	2	112	30,332	3	0	2	123	30,332	3	0	2	123
		AFRR90	27,872	4	0	3	113	30,622	5	0	3	124	30,622	5	0	3	124
		AFRL90	27,989	4	0	3	113	30,751	5	0	3	125	30,751	5	0	3	125

Luminaire Weight by Mounting Type

Mounting Configuration	Total Luminaire Weight
SPA	30 lbs
RPA	32 lbs
MA	30 lbs
WBA	33 lbs
WBASC	36 lbs
IS	33 lbs
AASP	33 lbs
AARP	35 lbs
AAWB	36 lbs
AAWSC	39 lbs

RSX2 with Round Pole Adapter (RPA)

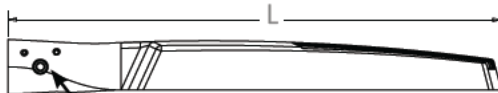
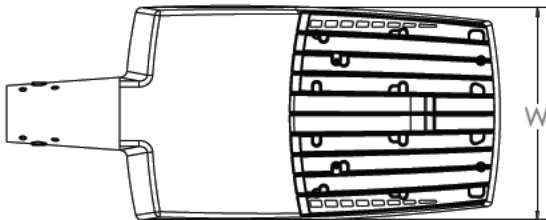


Length: 30.3" (77.0 cm)
 Width: 13.4" (34.0 cm)
 Height: 3.0" (7.6 cm) Main Body
 7.2" (18.3 cm) Arm

Note: RPA — Round Pole mount can also be used to mount on square poles by omitting the round pole adapter plate shown here.



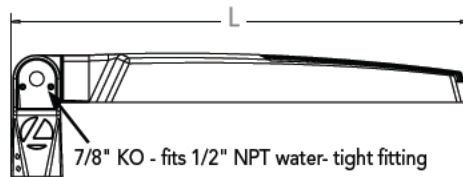
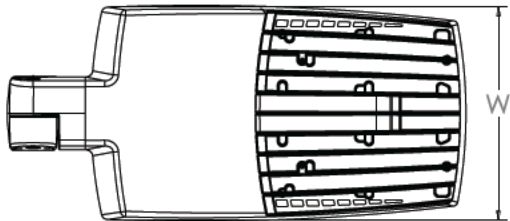
RSX2 with Mast Arm Adapter (MA)



Length: 30.6" (77.7 cm)
 Width: 13.4" (34.0 cm)
 Height: 3.0" (7.6 cm) Main Body
 3.5" (8.9 cm) Arm

7/16" locking thru bolt/nut provided

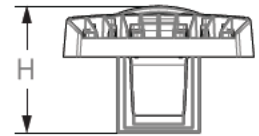
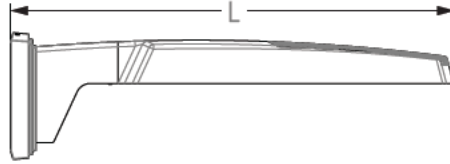
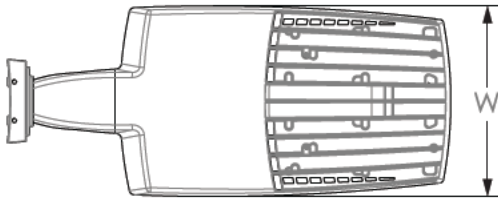
RSX2 with Adjustable Slipfitter (IS)



Length: 28.3" (71.9 cm)
 Width: 13.4" (34.0 cm)
 Height: 3.0" (7.6 cm) Main Body
 7.6" (19.3 cm) Arm

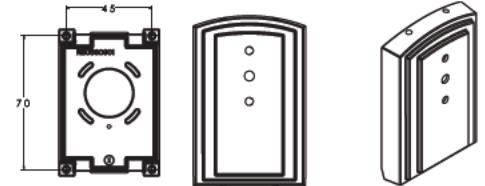
7/8" KO - fits 1/2" NPT water-tight fitting

RSX2 with Wall Bracket (WBA)

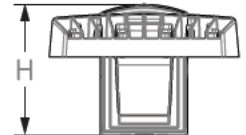
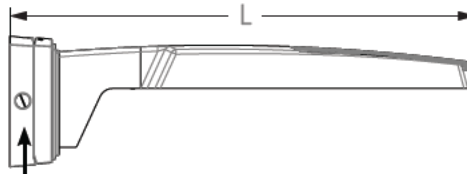
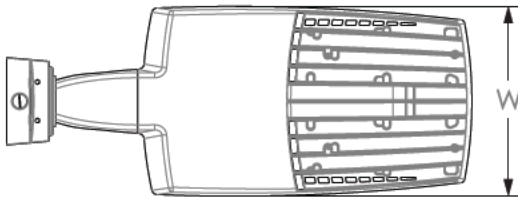


Length: 31.2" (79.2 cm)
 Width: 13.4" (41.7 cm)
 Height: 3.0" (7.6 cm) Main Body
 8.9" (22.6 cm) Arm

Wall Bracket (WBA) Mounting Detail



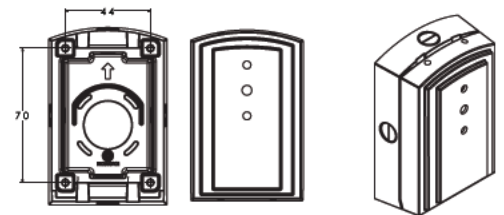
RSX2 with Wall Bracket with Surface Conduit Box (WBASC)



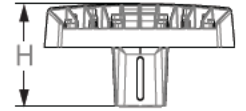
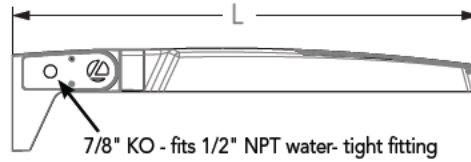
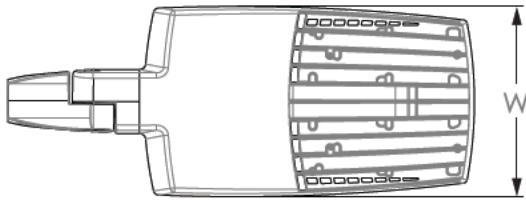
3/4" NPT taps with plugs - Qty (4) provided

Length: 32.8" (83.3 cm)
 Width: 13.4" (41.7 cm)
 Height: 3.0" (7.6 cm) Main Body
 9.2" (23.4 cm) Arm

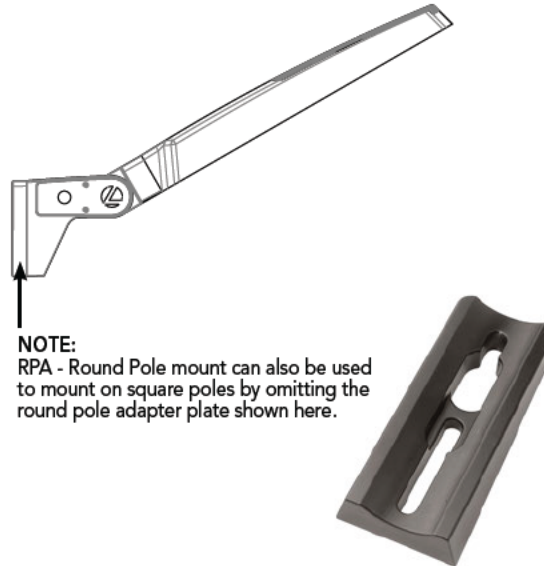
Surface Conduit Box (SCB) Mounting Detail



RSX2 with Adjustable Tilt Arm - Square or Round Pole (AASP or AARP)



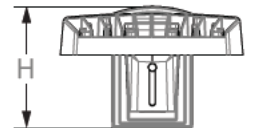
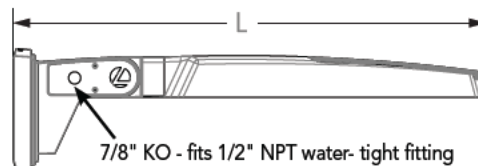
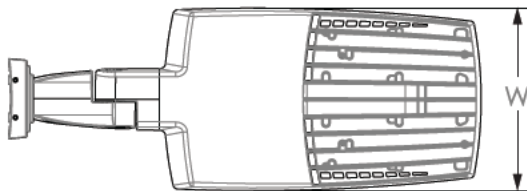
Length: 32.8" (83.3 cm) **AASP**
 33.8" (85.9 cm) **AARP**
 Width: 13.4" (34.0 cm)
 Height: 3.0" (7.6 cm) Main Body
 7.2" (18.2 cm) Arm



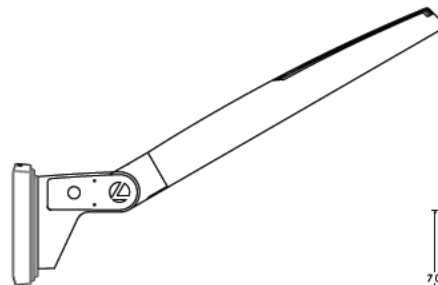
NOTE:
 RPA - Round Pole mount can also be used to mount on square poles by omitting the round pole adapter plate shown here.

Notes
 AASP: Requires 3.0" min. square pole for 1 at 90°. Requires 3.5" min. square pole for mounting 2, 3, 4 at 90°.
 AARP: Requires 3.2" min. dia. round pole for 2, 3, 4 at 90°. Requires 3.0" min. dia. round pole for mounting 1 at 90°, 2 at 180°, 3 at 120°.

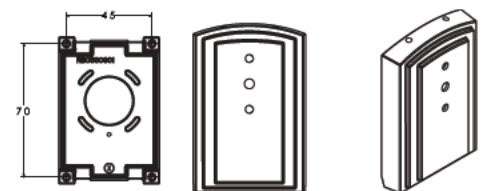
RSX2 with Adjustable Tilt Arm with Wall Bracket (AAWB)



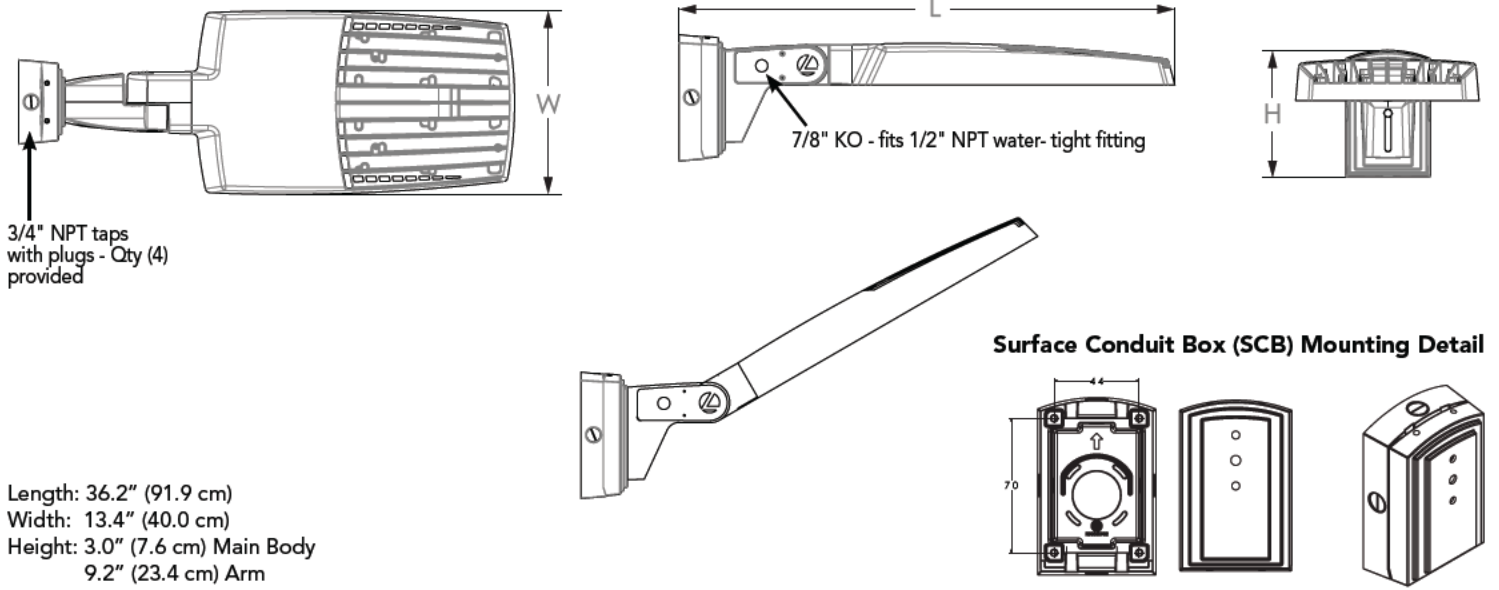
Length: 34.7" (88.0 cm)
 Width: 13.4" (34.0 cm)
 Height: 3.0" (7.6 cm) Main Body
 8.9" (22.6 cm) Arm



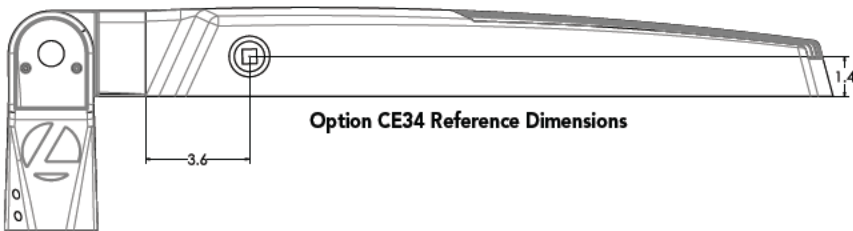
Wall Bracket (WBA) Mounting Detail



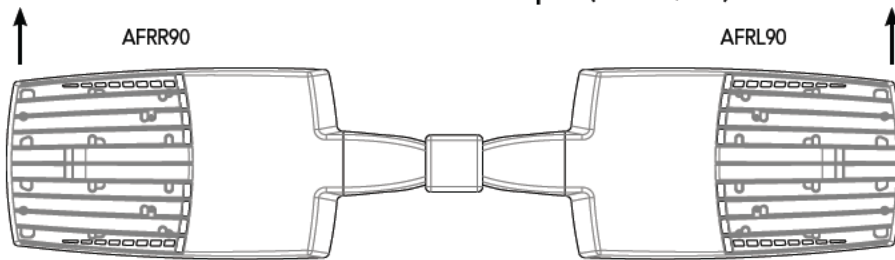
RSX2 with Adjustable Tilt Arm with Wall Bracket and Surface Conduit Box (AAWSC)



Additional Reference Drawings

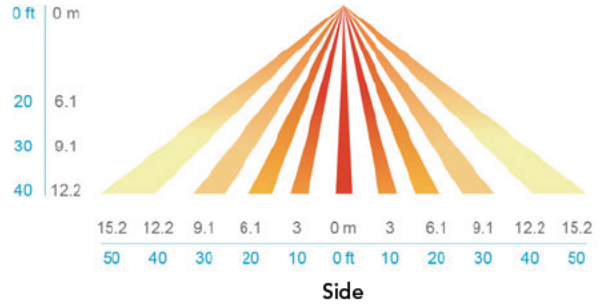
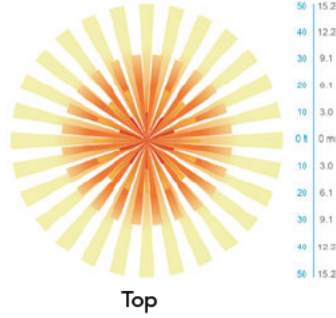
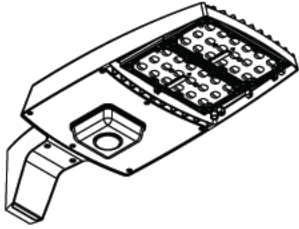


Automotive Front Row - Rotated Optics (AFRL90/R90)



(Example: 2@180 - arrows indicate direction of light exiting the luminaire)

NLTAIR2 PIRHN nLight
Sensor Coverage Pattern
nLight PIRHN



Motion Sensor Default Settings - Option PIRHN						
Option	Dimmed State (unoccupied)	High Level (when occupied)	Photocell Operation	Dwell Time (occupancy time delay)	Ramp-up Time (from unoccupied to occupied)	Ramp-down Time (from occupied to unoccupied)
NLTAIR2 PIRHN	Approx. 30% Output	100% Output	Enabled @ 1.5FC	7.5 minutes	3 seconds	5 minutes

*Note: NLTAIR2 PIRHN default settings including photocell set-point, high/low dim rates, and occupancy sensor time delay are all configurable using the Clarity Pro App. Sensor coverage pattern shown with luminaire at 0°. Sensor coverage pattern is affected when luminaire is tilted.

FEATURES & SPECIFICATIONS

INTENDED USE

The RSX LED area family is designed to provide a long-lasting, energy-efficient solution for the one-for-one replacement of existing metal halide or high pressure sodium lighting. The RSX2 delivers 11,000 to 31,000 lumens and is ideal for replacing 250W to 1000W HID pole-mounted luminaires in parking lots and other area lighting applications.

CONSTRUCTION AND DESIGN

The RSX LED area luminaire features a rugged die-cast aluminum main body that uses heat-dissipating fins and flow-through venting to provide optimal thermal management that both enhances LED performance and extends component life. Integral "no drill" mounting arm allows the luminaire to be mounted on existing pole drillings, greatly reducing installation labor. The light engines and housing are sealed against moisture and environmental contaminants to IP66. The low-profile design results in a low EPA, allowing pole optimization. Vibration rated per ANSI C136.31: 3G Mountings: Include SPA, RPA, MA, IS, AASP, AARP rated for 3G vibration. 1.5G Mountings: Include WBA, WBASC, AAWB and AAWSC rated for 1.5G vibration.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures superior adhesion as well as a minimum finish thickness of 3 mils. The result is a high-quality finish that is warranted not to crack or peel.

OPTICS

Precision acrylic refractive lenses are engineered for superior application efficiency, distributing the light to where it is needed most. Available in short and wide pattern distributions including Type 2, Type 3, Type 3S, Type 4, Type 4S, Type 5, Type 5S, AFR (Automotive Front Row) and AFR rotated AFRR90 and ARFL90.

ELECTRICAL

Light engine(s) configurations consist of high-efficiency LEDs mounted on metal-core circuit boards and aluminum heat sinks to maximize heat dissipation. Light engines are IP66 rated. LED lumen maintenance is >L92/100,000 hours. CCT's of 3000K, 4000K and 5000K (minimum 70 CRI) are available. Class 1 electronic drivers ensure system power factor >90% and THD <20%. Easily serviceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

STANDARD CONTROLS

The RSX LED area luminaire has a wide assortment of control options. Dusk to dawn controls include MVOLT and 347V button-type photocells and NEMA twist-lock photocell receptacles.

nLIGHT AIR CONTROLS

The RSX LED area luminaire is also available with nLight® AIR for the ultimate in wireless control. This powerful controls platform provides out-of-the-box basic motion sensing with photocontrol functionality and is suitable for mounting heights up to 40 feet. No commissioning is required when using factory default settings that provide basic stand-alone motion occupancy dimming that is switched on and off with a built-in photocell. See chart above for motion sensor default out-of-box settings. For more advanced wireless functionality, such as group dimming, nLight AIR can be commissioned using a smartphone and the easy-to-use CLAIRITY app. nLight AIR equipped luminaires can be grouped, resulting in motion sensor and photocell group response without the need for additional equipment. Scheduled dimming with motion sensor over-ride can be achieved when used with the nLight Eclipse. Additional information about nLight Air can be found [here](#).

INSTALLATION

Integral "no-drill" mounting arm allows for fast, easy mounting using existing pole drillings. Select the "SPA" option for square poles and the "RPA" option to mount to round poles. Note, the RPA mount can also be used for mounting to square poles by omitting the RPA adapter plate. Select the "MA" option to attach the luminaire to a 2 3/8" horizontal mast arm or the "IS" option for an adjustable slipfitter that mounts on a 2 3/8" OD tenon. The adjustable slipfitter has an integral junction box and offers easy installation. Can be tilted up to 90° above horizontal. Additional mountings are available including a wall bracket, adjustable tilt arm for direct-to-pole and wall and a surface conduit box for wall mount applications.

LISTINGS

CSA Certified to meet U.S. and Canadian standards. Suitable for wet locations. Rated for -40°C minimum ambient. DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color temperature only. US Patent No. D882, 146S

BUY AMERICAN

Product with the BAA option is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT. Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.





BATTERY ENERGY STORAGE SYSTEM

REDACTED – Matter No. 21-00750



POWIN BATTERY ENCLOSURE

POWIN SMART ENCLOSURES

Powin Energy's cost effective smart enclosures are a scalable purpose-built battery solution that includes all of the balance of system (BOS) equipment that can be modified to meet local AHJ requirements. The thermal management of this enclosure has been meticulously designed through air ducting and HVAC, providing an optimal temperature controlled environment for the battery enabling deployment in many different geographical climate types. Powin Smart Enclosures come in 20^{FT}, 40^{FT} and 53^{FT} sizes.

FULLY INTEGRATED

- + Up to 20 Stack225s or Stack230s per enclosure in parallel
- + Powin's patented StackOS integrated Battery Management and Energy Management Platform
- + HVAC & forced air with ducting that directly targets the stacks

- + AC breaker panel for coms and aux loads
- + Fire suppression system that also provides detection and monitoring
- + DC Collection, cable and tray
- + IP 54 rated
- + Insulation options for hot and cold climates
- + Isolation, and over current and fault protection
- + Minimal on site installation requirements

COMMUNICATION CABINET

- + Full state of awareness monitoring for fire suppression/ HVAC/inverter and transformer status/E stop/UPS aux
- + Switch
- + Router
- + UPS – Control
- + Linux computer
- + HMI
- + Controls interface can connect to any SCADA system



POWIN ENERGY ENCLOSURES TECHNICAL SPECIFICATIONS

REDACTED – Matter No. 21-00750



MODEL	20FT ENCLOSURE		40FT ENCLOSURE			53FT ENCLOSURE	
Stack Product	Stack225	Stack230	Stack230P	Stack225	Stack230	Stack225	Stack230
Battery Chemistry	Lithium Iron Phosphate [LFP]						
Integrated BMS + EMS	StackOS™						
Rated DC Power (kW)	660	345	2100	1540	805	2200	1150
Maximum DC Energy*	1350	1380	3220	3150	3290	4500	4600
Duration @ Rated Power [hrs]	2	4	1.5	2	4	2	4
DC Voltage Range	760-963 VDC						
Max Current (A)	1080	540	2870	2520	1260	1800 x 2	900 x 2
Depth of Discharge	100%						
DC Round Trip Efficiency @ Rated Power (%)	93%		91%	93%			
Performance Guarantee	80% SoH after 3,650 cycles Or 70% SoH after 15 yrs	66.5% SoH after 7,300 cycles Or 70% SoH after 20 years	80% SoH after 5,840 cycles or 80% SoH after 16 yrs	80% SoH after 3,650 cycles Or 70% SoH after 15 years	66.5% SoH after 7,300 cycles Or 70% SoH after 20 years	80% SoH after 3,650 cycles Or 70% SoH after 15 yrs	66.5% SoH after 7,300 cycles Or 70% SoH after 20 years
Weight [lbs / kg]	42,125 / 19,108		90,500 / 41,050			126,455 / 57,360	
Dimensions	19'10.2" L x 8' W x 9'6" H		40' L x 8' W x 9'6" H			53' L x 8' W x 9'6" H	
Enclosure Type / Rating	ISO HC / NEMA3 / IP54						
Ambient Temperature Range	-10 to +50 °C						
Number of Stacks	6		14			20	
Energy Density [kWh / ft^2]	7.73	8.08	9.15	8.95	9.36	9.65	10.09
Fire Suppression	Included with Fire Suppression Agent, Fire Detection Panels with Sensors, Pull Handle, and Lights, and FDC dry standpipe connection						
Cooling	Dual Redundant Forced Air HVAC with Thermostat, Humidity Control, & Economizer						
DC Collection, Cable Tray, AC Load Panel	Included						
Code and Standards Compliance	UL1973, UL9540A, IEC62619, NFPA855, ISO1496-1						
*Usable energy for fully populated container; Actual usable energy varies by use case and DC topology; Contact Powin for an accurate estimate							

ABOUT POWIN ENERGY

Powin Energy is creating the next wave of safe and scalable battery energy storage that is purpose-built for the demands of utility-scale, commercial and industrial, and microgrid applications. With an unrivaled team of experts from across the energy industry, almost three decades of supply chain management expertise, extensive battery management software proficiency, a modular architecture, and a streamlined installation processes, Powin is making energy storage highly cost-effective and relatively pain free.

CONTACT US

powinenergy.com

sales@powinenergy.com

ANNEX D-1: TRANSFORMER SPECIFICATIONS

**SPECIFICATION
FOR MAIN POWER
STEP-UP TRANSFORMER
FOR
RENEWABLE ENERGY
PROJECTS**

