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# Product Specifications
# GC200 Series

**Supported Photovoltaic Panels**
Suntech STP260/270/280 (GC201)
Sunpower-210-WHT (GC202)
Evergreen ES-190/195/200 (GC203)
Suntech STP190/200/210-18Ub (GC204)
Suntech STP170/175/180-24/Ab (GC205)
Sharp ND-216U1F (GC206)
Kyocera KD205GX LP (GC207)

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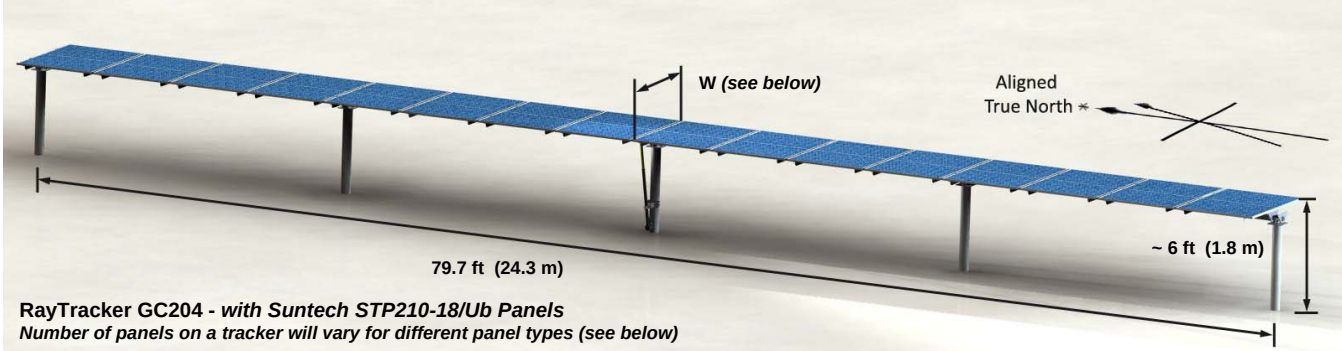
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60-00125 Rev.D

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**RayTracker GC204 - *with Suntech STP210-18/Ub Panels***
***Number of panels on a tracker will vary for different panel types (see below)***

## Size / Weight / Dimensions[1]

| | |
|---|---|
| Standard Installed Dimensions | As shown above |
| Heaviest individual component (20ft Beam) | 178 lbs (81 kg) |

| RayTracker Model | PV Panel | W (Tracker Width) | # of PV Panels | # of Strings[2] | Unladen Weight[3] | Weight[2] (incl. panels) |
|---|---|---|---|---|---|---|
| GC201 | Suntech STP 260/270/280-24Vb | 78.3 in | 24 | 2 | 1713 lbs | 2928 lbs |
| GC202 | Sunpower SPR-210-WHT | 63.0 in | 30 | 3 | 1727 lbs | 2717 lbs |
| GC203 | Evergreen ES-190/195/200 | 75.2 in | 30 | 2 | 1848 lbs | 3049 lbs |
| GC204 | Suntech STP190/200/210-18Ub | 78.3 in | 32 | 2 | 1934 lbs | 3115 lbs |
| GC205 | Suntech STP170/175/180-24/Ab | 63.8 in | 30 | 3 | 1727 lbs | 2750 lbs |
| GC206 | Sharp ND-216U1F | 78.4 in | 28 | 2 | 1830 lbs | 3127 lbs |
| GC207 | Kyocera KD205GX LP | 78.1 in | 30 | 2 | 1938 lbs | 3162 lbs |

## Operating Specifications

| | |
|---|---|
| Tracking Accuracy | +/- 5° *(typical)*; +/- 10° *(maximum)* |
| Range of Motion | +/- 45° *(from zenith)* |
| Tracking Method | GPS time-derived positioning w/ proprietary Shade Avoidance |
| Operational Latitude Range | 40°N – 40°S |
| Max Wind Speed for Tracking Operation[4] | 40 mph (64 kmph) |
| Warranty[5] | Two years limited warranty on parts |
| Component Compliance *(as required)* | NEC 690/UL/FCC Class A |

## Installation Zoning

| | |
|---|---|
| Wind *(Withstanding)* | Max 85 mph (3-sec gust) Exposure D[6] |
| Seismic | Zone 4 *(UBC/CBC)* |
| Max Snow Loading | 45 lb/ft² |

## Installation Tolerance Budget

| | |
|---|---|
| Top of Post Tolerance at Installation | +/- 0.5" in X, Y and Z |
| Differential Post Settling Tolerances (within lifetime) | +/- 0.5" in Z and Y |
| Maximum Allowable Dynamic Deflection | +/- 1.5" in Z and Y |
| Maximum Total (including all above)<br>*The X axis is in line with the tracker (N-S), the Y axis is perpendicular to the tracker (E-W) and Z axis is vertical.* | +/- 2.5" in Z and Y and +/- 0.5" in X |

[1] Dimensions shown here are for reference only. Please see engineering drawings for exact and complete dimensions.

[2] The number of panels per string specified here are typical values for California. A site engineer should determine the proper number of panels per string based on the temperature history of the install site per the National Electric Code.

[3] Weights shown here do not include weights of vertical posts or foundations

[4] If wind speed is greater than 40mph at the time of actuation, the tracker will pause and will stay paused until the next recovery attempt.

[5] The only warranty from Energy Innovations, Inc. is set forth in the express warranty statement that accompanies the product or services. Nothing herein shall be construed as an additional warranty.

[6] Assuming no terrain effects (Kzt=1.0), maximum installed elevation of 25' above grade, velocity pressure exposure (Kz=1.03), Wind directionality (Kd=0.85) and Importance factor (I=0.87)

| | |
|---|---|
| **Hardware** | |
| Included | Horizontal beams, bearings, vertical post caps, actuator assembly, tracker grounding hardware, one controller per 12 trackers |
| Not Included | PV panels, vertical posts, foundations/supports, wiring, strain relief hardware, PV panel grounding hardware |
| **Annual Energy Delivery Estimates[7]** | |
| Percent Improvement vs. Deployed Flat | Up to 38% |
| Actuator and Controller Energy Consumption | 12 Watt-hours DC/day |
| **Stowing** | |
| Method | Manual switch between stowing and normal operation |
| Configurations | 0º user-initiated stowing, 10º autonomous stowing at night |
| **Component Finishing** | |
| Factory Applied Coating | Grey powder coat[8] |
| **Installation Checklist *(after one month)*** | |
| **Component(s)** | |
| Bolts | Inspect for preload |
| **Inspection** | |
| Recommended Annual Inspection | Inspect all RayTracker parts for damage, obstruction and excessive corrosion |
| **Controller Specifications** | |
| Input Power | 110V AC |
| Architecture | Centralized controller with microprocessor |
| Maximum Number of Trackers per Controller | 12 |
| Tracker-to-Tracker Shade Avoidance | Based on sun position and GCR* |
| Shade Avoidance Method** | The RayTracker maintains optimal panel angle to maximize sun exposure and eliminate early morning and late evening shadows. |
| Data Entry and Programming | EI Certified Technician |

***GCR:** is the ground coverage ratio and is defined as the E-W dimension of the tracker (W) divided by the tracker to tracker spacing (center to center). It is a measure of land usage that impacts energy production. Typical GCRs for ground mount installations are 25% - 50%

****Shade Avoidance Technology:** is a feature that allows the RayTracker to gather more energy from the sun by causing the panels to lie flatter in earlier and later parts of the day, when the sun is at low angles. Panels of conventional tracking systems may shadow each other during these times, reducing or eliminating power generation. If multiple RayTracker GC trackers are installed in a planar fashion, Shade Avoidance Technology prevents panel to panel shading. If installed in multiple planes (due to sloped ground for example) the site designer should pay careful attention to minimize tracker to tracker shading

[7] Performance estimates are for reference only. Estimates are generated by Energy Innovations using PVWatts Version 1 Software from the National Renewable Energy Laboratory (www.nrel.gov, www.pvwatts.org). Site engineers planning to install RayTracker should use their software of choice to estimate performance for a particular location and set of environmental conditions.

[8] Energy Innovations provides a touch up paint that is used to cover any scratches incurred during handling and installation.

## RayTracker Loading Guidelines

Loading values are provided as guidelines only and are not sufficient to permit final installation. Final calculations for a specific site are the responsibility of the site engineer.

| | Maximum: Suntech 280 Loading (GC201) | | | | Minimum: SunPower 210 Loading (GC202) | | | |
|---|---|---|---|---|---|---|---|---|
| | Up to 15 ft | | Up to 25 ft | | Up to 15 ft | | Up to 25 ft | |
| **Tracker** | | | | | | | | |
| Weight | 2928 | lbs | 2928 | lbs | 2717 | lbs | 2717 | lbs |
| **Tracker Wind Loading** | | | | | | | | |
| Max downforce | 13856 | lbs | 14811 | lbs | 11556 | lbs | 12328 | lbs |
| Max lift | 6439 | lbs | 7257 | lbs | 4859 | lbs | 5521 | lbs |
| Max Lateral | 9985 | lbs | 10857 | lbs | 8076 | lbs | 8781 | lbs |
| Actuator Torque | 10280 | lb-ft | 11177 | lb-ft | 6681 | lb-ft | 7264 | lb-ft |
| **Vertical Post** | | | | | | | | |
| ***End Post(not shared)*** | | | | | | | | |
| Weight burden | 366 | lbs | 366 | lbs | 340 | lbs | 340 | lbs |
| Max downforce | 1732 | lbs | 1851 | lbs | 1444 | lbs | 1541 | lbs |
| Max lift | 1610 | lbs | 1814 | lbs | 1215 | lbs | 1380 | lbs |
| Max lateral | 1248 | lbs | 1357 | lbs | 1009 | lbs | 1098 | lbs |
| ***Mid Post*** | | | | | | | | |
| Weight burden | 732 | lbs | 732 | lbs | 679 | lbs | 679 | lbs |
| Max downforce | 3464 | lbs | 3703 | lbs | 2889 | lbs | 3082 | lbs |
| Max lift | 3219 | lbs | 3629 | lbs | 2429 | lbs | 2760 | lbs |
| Max lateral | 2496 | lbs | 2714 | lbs | 2019 | lbs | 2195 | lbs |

**Notes:**
RayTracker Wind Loading Calculations based on

- ASCE 7 (2005 Edition)
- 85 mph (3-sec gust) Exposure D
- No terrain effects (Kzt = 1.0).
- A maximum installed elevation of either (a) 0'-15' or (b) 25' above grade.
- Panel positions at angles from $0^{o}$ to $45^{o}$.
- Velocity Pressure Exposure Coefficient, Kz = 1.03.
- Wind directionality factor, Kd = 0.85.
- Importance factor, I = 0.87.

## Vertical Post Specifications

**Central (Actuator) Post**

**REQUIRED**

- Be constructed from 6.625" +/- 1% OD pipe (to interface with actuator clamp)
- Be taller than 61.5" above foundation or ground level (for actuator clearance)

**RECOMMENDATION:** 6" SCH40 Pipe that is no taller than 62". IF the site conditions require a greater post height – site engineer can perform additional analysis and specify post type accordingly.

**Side (Non-Actuator) Posts**

**REQUIRED**

- Be constructed from Pipe 9" OD or less (for bearing assembly attachment)
- Be taller than 24" above foundation or ground level (for panel clearance)

**RECOMMENDATION:** 6" SCH40 Pipe

**PLEASE NOTE: Site analysis and final specification of posts is the responsibility of the site engineer. Center post calculation must include loading effect of actuator on post.**

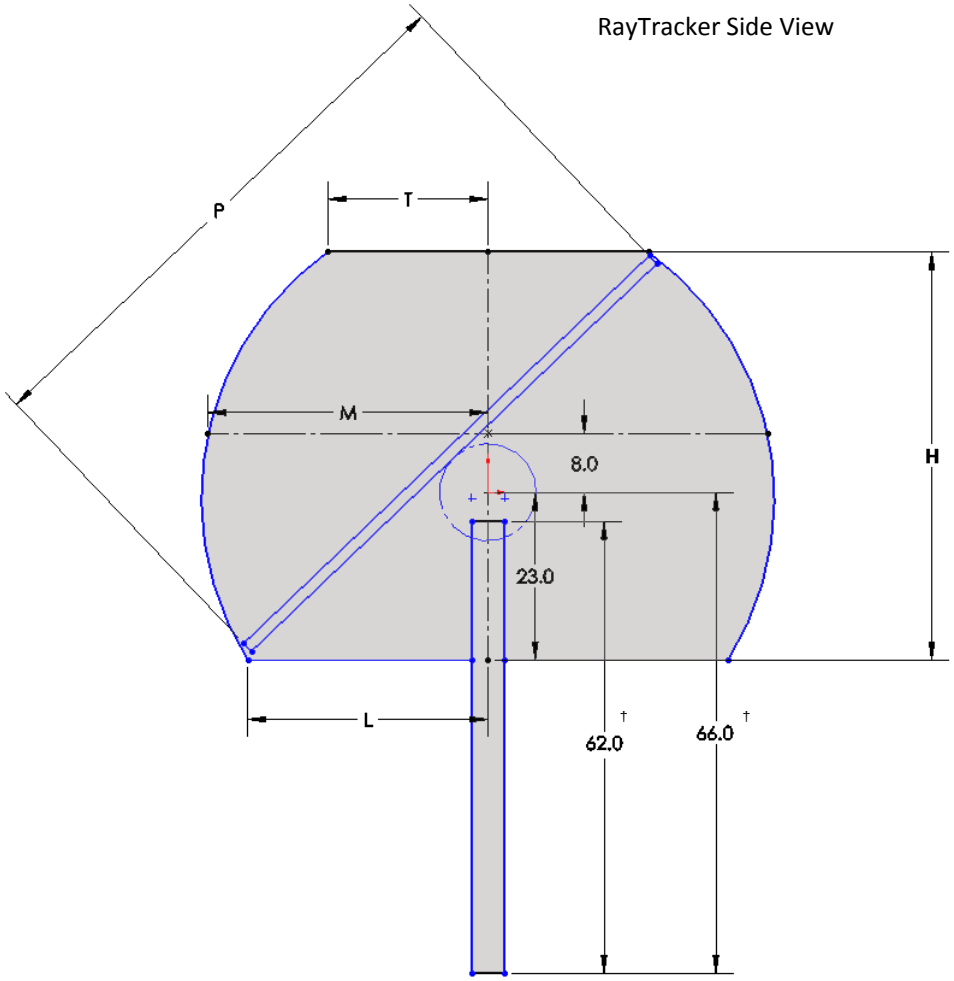
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## Envelopes

### Panel Envelope (keep out zone)

| Model | PV Panel | P | T | M | H | L |
|---|---|---|---|---|---|---|
| GC201 | Suntech STP 260/270/280-24Vb | 78.3 | 25 | 41 | 57 | 34 |
| GC202 | Sunpower SPR-210-WHT | 63.0 | 20 | 34 | 47 | 29 |
| GC203 | Evergreen ES-190/195/200 | 75.2 | 24 | 40 | 55 | 33 |
| GC204 | Suntech STP190/200/210-18Ub | 78.3 | 25 | 41 | 57 | 34 |
| GC205 | Suntech STP170/175/180-24/Ab | 63.8 | 20 | 34 | 47 | 29 |
| GC206 | Sharp ND-216U1F | 78.4 | 25 | 41 | 57 | 34 |
| GC207 | Kyocera KD205GX LP | 78.1 | 25 | 41 | 57 | 34 |

RayTracker Side View



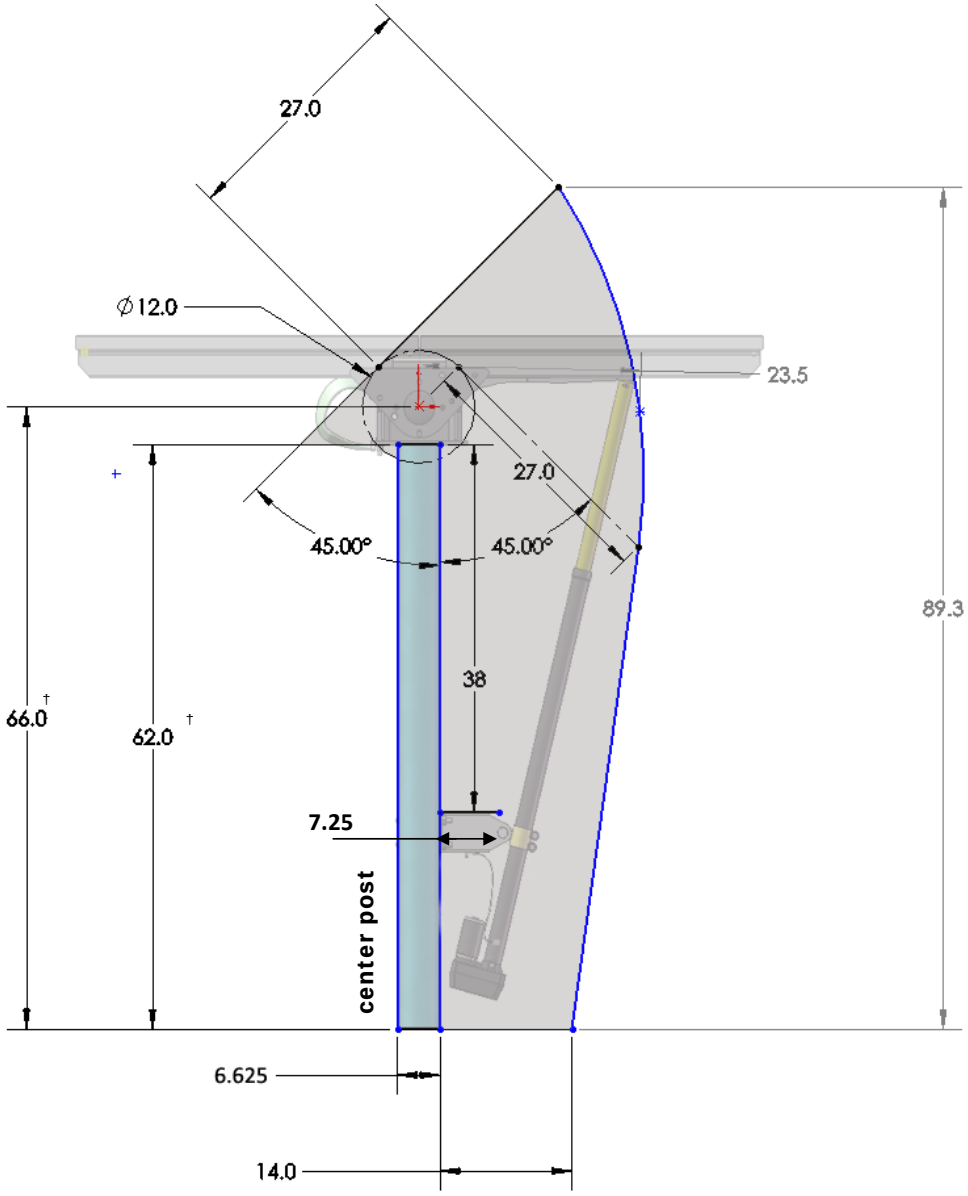

- *All dimensions are in inches*
- *Shaded region must be devoid of mechanical obstructions and/or standing water*
- *The dimensions in this drawing indicate the keep out zone, not the part dimensions.*

† These values are representative of a typical install. Refer to vertical post specifications (page 5) for more information.

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## Envelopes cont...

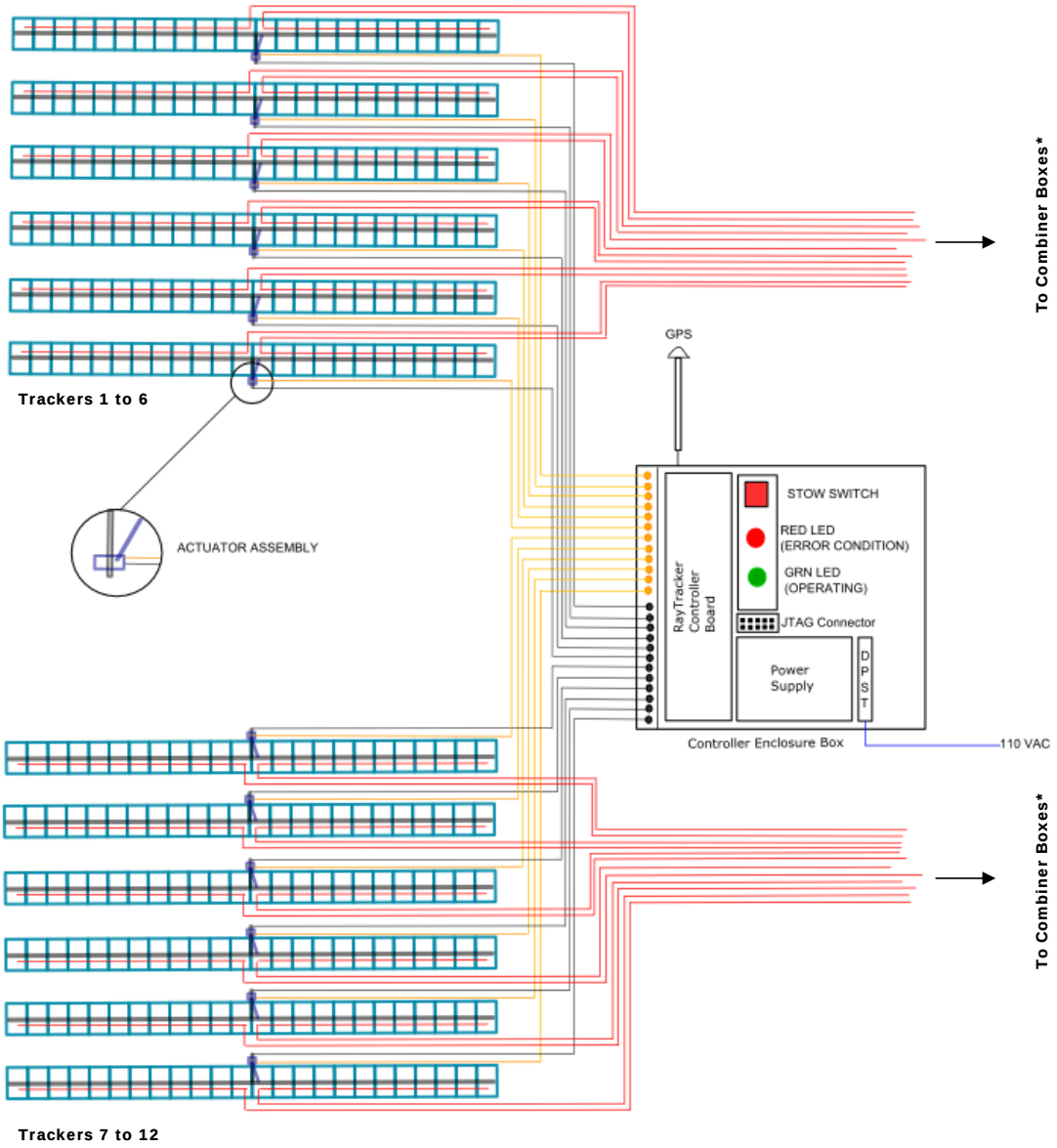
### Actuator Envelope on the center post (keep out zone)




- *All dimensions are in inches*
- *Shaded region must be devoid of mechanical obstructions and/or standing water*
- *The dimensions in this drawing indicate the keep out zone, not the part dimensions.*

† These values are representative of a typical install. Refer to vertical post specifications (page 5) for more information.

## Electrical Wiring Diagram




**Red Wire**: 600 VDC Power Cable (not supplied)

**Bundled in one cable**

**Orange Wire**: 36 VDC Power Cable (not supplied)
**Black Wire**: Encoder feedback Cable (not supplied)

**Blue Wire**: 110 VAC Power wire (not supplied)

* number of cable returns per tracker depends on panel type
See actuator to controller board wiring specifications in the appendix for more detail

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# Appendices

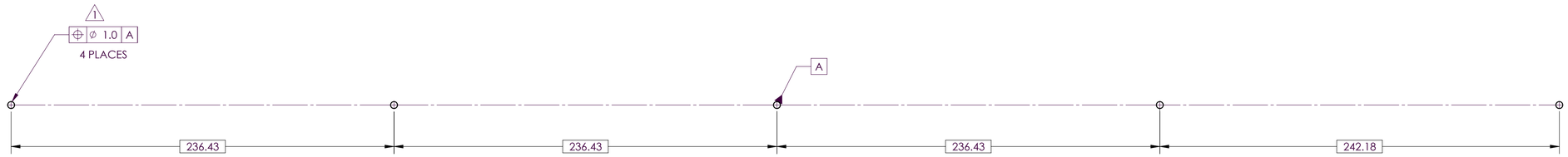
## Interfaces

- RayTracker Post Layout Specification
- Post Cap Welding Specification
- Suggested Shared Post Specification
- Actuator to Controller Board Wiring Specifications

## General Information

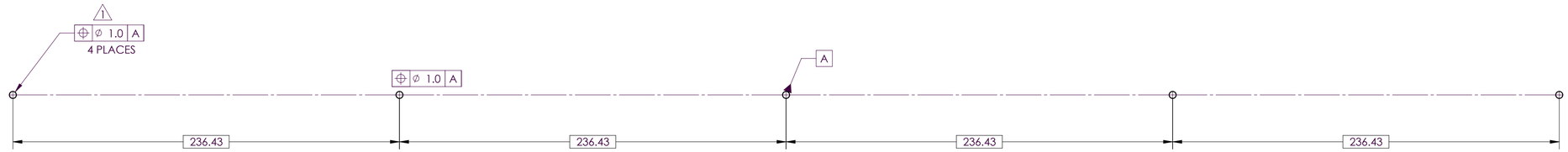
- Installation Drawings
- Bill of Materials
- List of parts and part names

| REVISIONS | | | | |
|---|---|---|---|---|
| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
| | A | INITIAL RELEASE | 2008-04-04 | ECO-2094 |
| C1-C7 | B | SHEET TEMPLATE MODIFIED<br>POST HEIGHT CHANGED FROM 36" TO 24" AND 62" TO 61.50" | 2008-05-02 | ECO-2102 |
| E2 | C | CORRECTED CENTER-TO-CENTER DIMENSION FOR SHARED POST CONFIGURATION | 2008-07-23 | ECO-2123 |

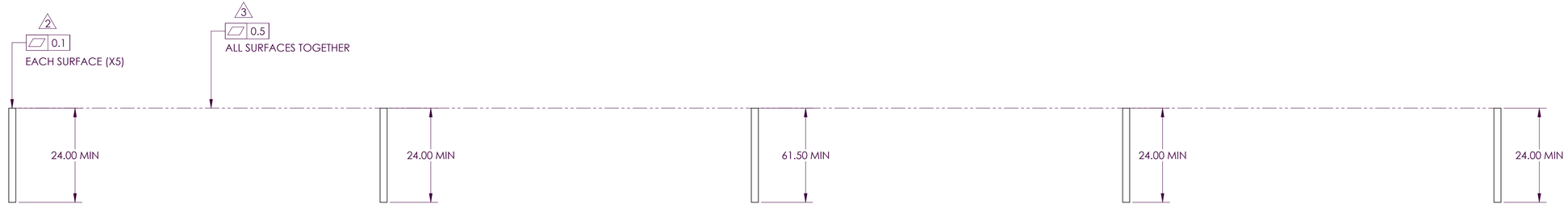



SHARED POST CONFIGURATION

THIS DIMENSION APPLIES
ANYWHERE SHARED POST IS USED




STANDARD CONFIGURATION




CENTER POST REQUIRES GREATER HEIGHT
FOR ACTUATOR CLEARANCE

EXPLANATION OF DRAWING CALLOUTS:

1. ALL 4 NON-CENTER POSTS MUST BE LOCATED WITHIN A 1 INCH DIAMETER TOLERANCE BAND COMPARED TO THE NOMINAL DIMENSION FROM THE CENTER POST
2. THE TOP SURFACE OF EACH POST MUST BE FLAT TO LESS THAN 0.1 INCH
3. THE TOP SURFACES OF ALL 5 POSTS MUST ALL FIT WITHIN A THEORETICAL BAND THAT IS 0.5 INCHES WIDE

# SPECIFICATION, RAY TRACKER POST LAYOUT

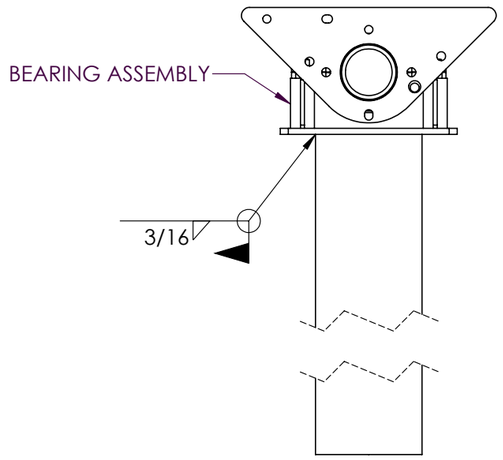
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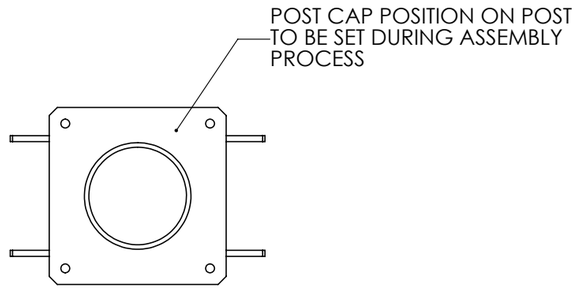
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| SCALE 1:36 | | SHEET 1 OF 1 |

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C3d | 60-00108 | D

| REVISIONS | | | | |
|---|---|---|---|---|
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| | A | INITIAL RELEASE | 2008-04-04 | ECO-2094 |
| | B | 30-00676 REPLACED WITH 20-00138<br>SHEET TEMPLATE MODIFIED | 2008-05-02 | ECO-2102 |
| B4 | C | REMOVED PART NUMBER OF BEARING ASSEMBLY | 2008-05-12 | ECO-2108 |




REV C
60-00109
B

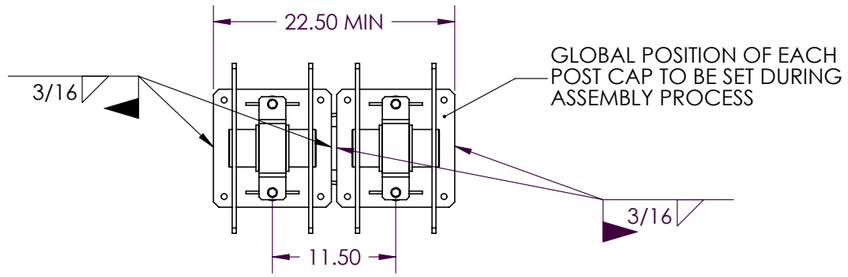
# SPECIFICATION, POST CAP WELDING

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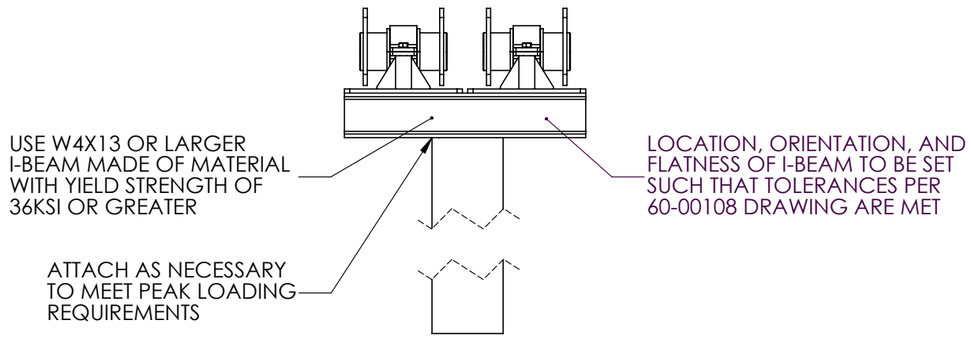
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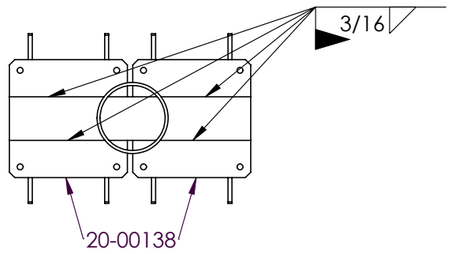
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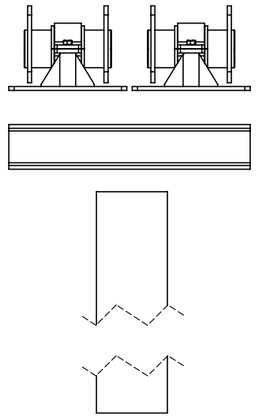
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| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
| | A | INITIAL RELEASE | 2008-04-04 | ECO-2094 |
| | B | 30-00676 REPLACED WITH 20-00138<br>SHEET TEMPLATE MODIFIED | 2008-05-02 | ECO-2102 |




THIS DIMESNSION DRIVES POST TO POST SPACING BETWEEN ADJACENT TRACKERS



EXPLODED VIEW

REV B
60-00110
B

# SPECIFICATION, SHARED POST

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| SIZE | DWG. NO. | REV |
|---|---|---|
| B | 60-00110 | B |
| SCALE 1:12 | | SHEET 1 OF 1 |

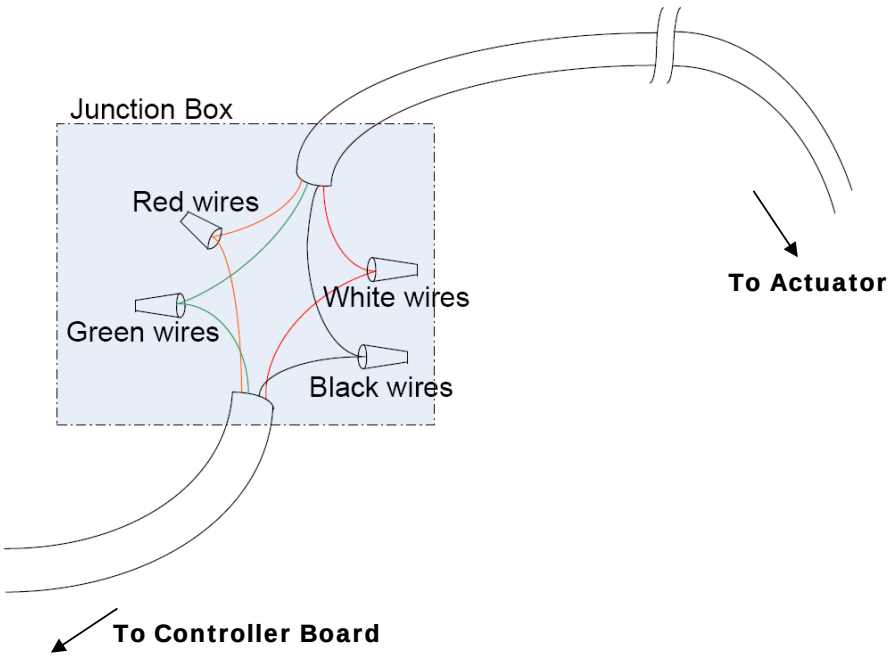
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# Actuator to Controller Board Wiring Specifications

## Cable Specifications

All the cables will be 4/12 AWG SOOJ cable ( 4 conductors each with 12AWG with standard color: black, white, green and red).

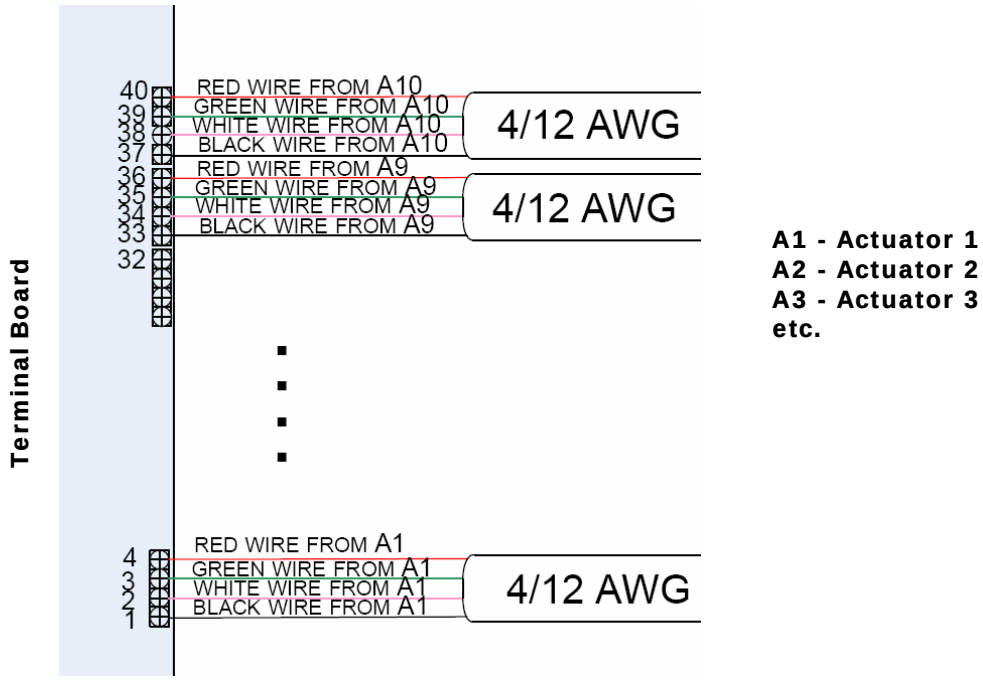
## Actuator Connection



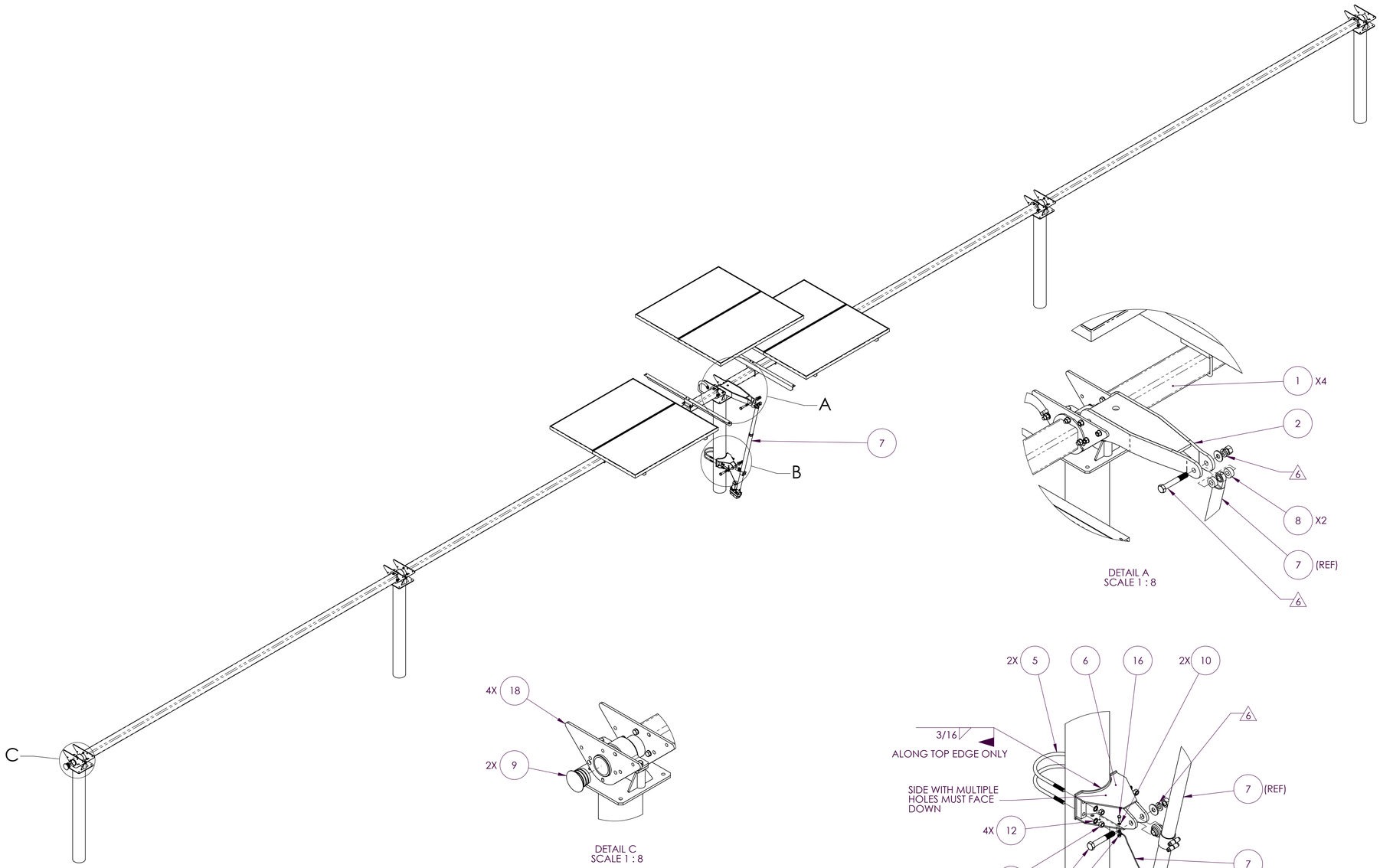

**NOTE:**
Actuator cable provided (1m length)
Junction box and cable to controller board NOT provided

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# Terminal Board Connections



| REVISIONS | | | | |
|---|---|---|---|---|
| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
| | A | INITIAL RELEASE | 2008-04-04 | ECO-2094 |
| | B | SHEET TEMPLATE MODIFIED | 2008-05-02 | ECO-2102 |
| 1A8<br>1A2 | C | REMOVED NOTES 1-5 AND 8, REMOVED CALLOUTS TO DELETED NOTES<br>REMOVED PART NUMBER FROM BOM | 2008-05-12 | ECO-2108 |
| | D | 4" POST REPLACED WITH 6" VERSION<br>4" ACTUATOR CLAMP REPLACED WITH 6" VERSION<br>DETAIL VIEW LOCATIONS CHANGED | 2008-07-01 | ECO-2119 |







DETAIL A
SCALE 1 : 8




DETAIL C
SCALE 1 : 8




DETAIL B
SCALE 1 : 8

NOTES: UNLESS OTHERWISE SPECIFIED

1. DELETED
2. DELETED
3. DELETED
4. DELETED
5. DELETED
6. ACTUATOR HARDWARE AND GROUNDING STRAP INCLUDED WITH ACTUATOR
7. ENSURE BOLT AND NUT THREADS ARE CLEAN AND DRY BEFORE INSTALLING. DO NOT REUSE BOLTS ONCE THEY HAVE BEEN TORQUED.
8. DELETED
9. SOLAR PANELS AND POSTS ARE NOT PROVIDED BY ENERGY INNOVATIONS.
10. TOUCH UP ANY AREAS NOT COVERED BY GRAY POWDER COAT SURFACE (EXCLUDING NEXUS TUBE AND BEARING CLAMP)

* QUANTITY VARIES WITH PANEL TYPE. REFER TO ATTACHED BOM FOR SPECIFIC QUANTITIES

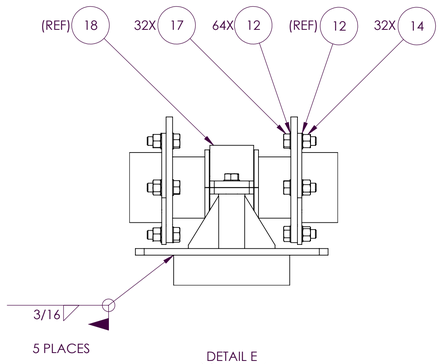
| | ITEM NO. | DESCRIPTION | -01/QTY. |
|---|---|---|---|
| 10 | 19 | TOUCH UP PAINT, ANSI 61 GRAY | AR |
| | 18 | ASSY, BEARING | 4 |
| | 17 | BOLT, HEX 0.50-13x1.5 | 32 |
| | 16 | BOLT, HEX 0.25-20x0.75 | * |
| | 15 | LOCKNUT, HEX NYLON INSERT 0.375-16 | * |
| | 14 | NUT, HEX 0.50-13 | 36 |
| | 13 | NUT, HEX 0.25-20 | * |
| | 12 | WASHER, LOCK, INTERNAL TOOTH - 0.5 | 68 |
| | 11 | WASHER, FLAT, ENGLISH 0.375 | * |
| | 10 | WASHER, LOCK, INTERNAL TOOTH - 0.25 | * |
| | 9 | PLUG, NEXUS | 2 |
| | 8 | SPACER, ACTUATOR | 2 |
| 6 | 7 | ACTUATOR | 1 |
| | 6 | WELDMENT, ACTUATOR CLAMP | 1 |
| | 5 | UBOLT, ROUND BEND | 2 |
| | 4 | UBOLT, SQUARE BEND | 6 |
| | 3 | WELDMENT, PANEL SUPPORT | * |
| | 2 | ASSY, BEARING | 1 |
| | 1 | ASSY, MAIN BEAM | 4 |

**RAYTRACKER ASSEMBLY, GENERAL SPECIFICATION**

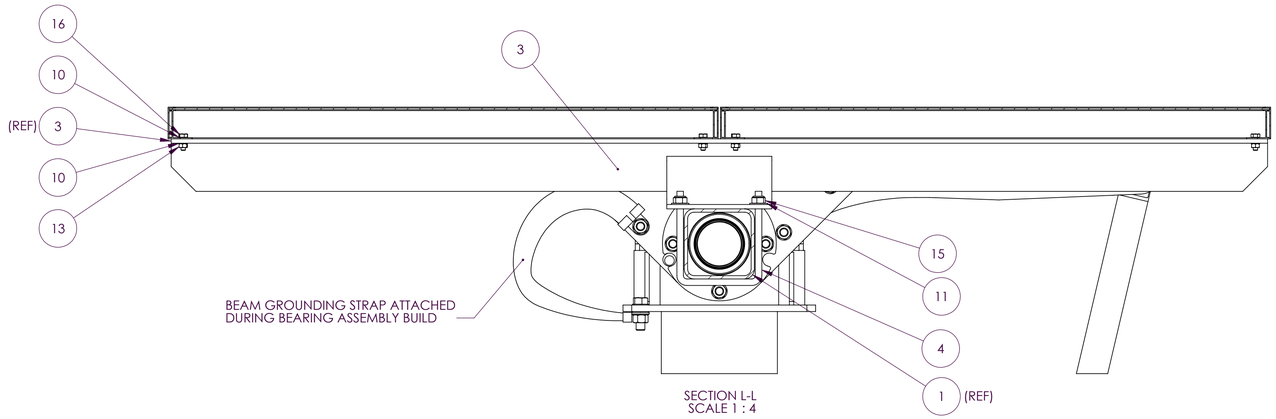
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| D | 60-00126 | D |
| SCALE 1:28 | | SHEET 1 OF 2 |

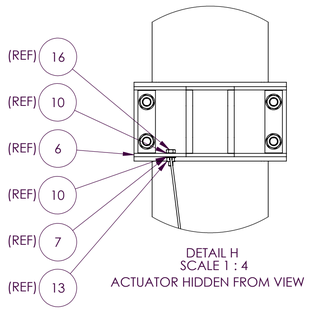
STATUS: Production, PRINTED ON: 7/1/2008, FROM: C:\Documents and Settings\skarlas\My Documents\PDM\60-00126 RayTracker Assembly, General Specification



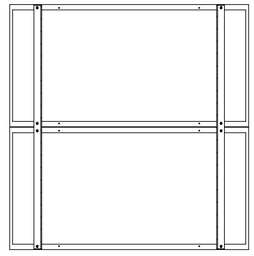

DETAIL E
SCALE 1 : 4



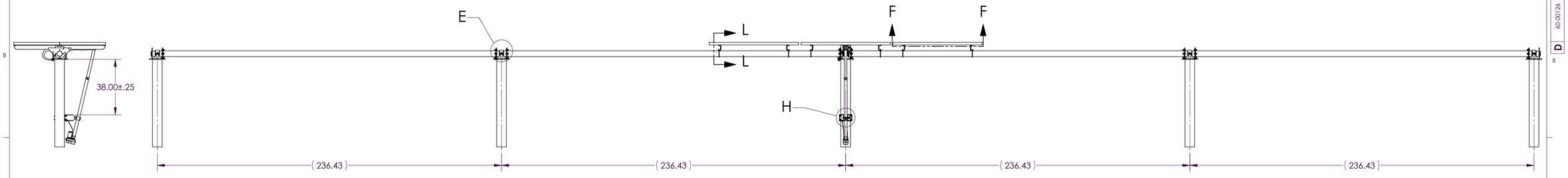

SECTION L-L
SCALE 1 : 4




DETAIL H
SCALE 1 : 4
ACTUATOR HIDDEN FROM VIEW



SECTION F-F
SCALE 1 : 18




| | | |
|---|---|---|
| SIZE D | DWG. NO. 60-00126 | REV D |
| SCALE 1:32 | | SHEET 2 OF 2 |

Energy Innovations

60-00126 D

STATUS: Production, PRINTED ON: 7/1/2008, FROM: C:\Documents and Settings\skarlas\My Documents\PDM\60-00126 RayTracker Assembly, General Specification

# Bill of Materials

**1 of 4**

## Core Assembly

60-00125 Rev.D

| Level | Part Number | Description | Qty |
|---|---|---|---|
| 1 | 20-00144-01 | RayTracker Core Assembly | 1 |
| 2 | 20-00130-01 | Assy, Main Beam | 4 |
| 3 | 30-00687-01 | Flange, Main Beam | 2 |
| 3 | 30-00691-01 | Beam, Main | 1 |
| 2 | 20-00138-01 | Assy, Bearing | 4 |
| 3 | 20-00143-01 | Assy, Nexus | 1 |
| 4 | 30-00679-01 | Tube, Nexus | 1 |
| 4 | 30-00741-01 | Flange, Nexus | 2 |
| 3 | 30-00644-03 | Washer, Lock, Internal Tooth | 2 |
| 3 | 30-00673-01 | Clamp, Bearing | 2 |
| 3 | 30-00675-01 | Bearing, Nexus | 2 |
| 3 | 30-00676-01 | Weldment, Post Cap | 1 |
| 3 | 30-00697-07 | Bolt, Hex 0.50-13 | 2 |
| 2 | 20-00138-02 | Assy, Bearing | 1 |
| 3 | 20-00143-02 | Assy, Nexus | 1 |
| 4 | 30-00679-01 | Tube, Nexus | 1 |
| 4 | 30-00693-01 | Retainer, Lateral | 2 |
| 4 | 30-00741-01 | Flange, Nexus | 2 |
| 3 | 30-00644-03 | Washer, Lock, Internal Tooth | 18 |
| 3 | 30-00645-03 | Nut, Hex | 8 |
| 3 | 30-00673-01 | Clamp, Bearing | 2 |
| 3 | 30-00675-01 | Bearing, Nexus | 2 |
| 3 | 30-00676-01 | Weldment, Post Cap | 1 |
| 3 | 30-00695-01 | Linkage, Actuator Arm | 1 |
| 3 | 30-00697-07 | Bolt, Hex 0.50-13 | 10 |
| 2 | 30-00644-01 | Washer, Lock, Internal Tooth | 2 |
| 2 | 30-00644-03 | Washer, Lock, Internal Tooth | 66 |
| 2 | 30-00645-03 | Nut, Hex | 36 |
| 2 | 30-00647-01 | Ubolt, Round Bend | 2 |
| 2 | 30-00744-01 | Weldment, Actuator Clamp | 1 |
| 2 | 30-00697-07 | Bolt, Hex 0.50-13 | 32 |
| 2 | 30-00711-01 | Plug, Nexus | 2 |
| 2 | 30-00754-01 | Touch Up Paint, ANSI 61 Gray | 1 |

## Actuator Assembly

| Level | Part Number | Description | Qty |
|---|---|---|---|
| 2 | 30-00701-01 | Actuator | 1 |
| 2 | 30-00753-01 | Grounding Strap, Actuator | 1 |
| 2 | 30-00644-03 | Washer, Lock, Internal Tooth | 2 |
| 2 | 30-00645-01 | Nut, Hex | 1 |
| 2 | 30-00750-04 | Bolt, Hex 0.25-20 | 1 |
| 2 | 30-00707-01 | Spacer, Actuator | 2 |

# Bill of Materials

**2 of 4**

## Electronics

| Level | Part Number | Description | Qty |
|---|---|---|---|
| 1 | 20-00132-01 | Controller | 1 per 12 trackers |

## Suntech STP260/270/280 (GC 201)

| Level | Part Number | Description | Qty |
|---|---|---|---|
| 1 | 20-00152-01 | Assy, Panel Mounting - GC201 | 1 |
| 2 | 20-00139-01 | Weldment, Panel Support | 24 |
| 3 | 30-00732-01 | L Angle, Panel Support Bottom | 1 |
| 3 | 30-00731-01 | L Angle, Panel Support Top | 1 |
| 2 | 30-00354-02 | Washer, Flat, English | 48 |
| 2 | 30-00644-01 | Washer, Lock, Internal Tooth | 192 |
| 2 | 30-00645-01 | Nut, Hex | 96 |
| 2 | 30-00681-01 | Ubolt, Square Bend | 24 |
| 2 | 30-00704-02 | Locknut, Hex Nylon Insert | 48 |
| 2 | 30-00750-04 | Bolt, Hex 0.25-20 | 96 |

## Sunpower SPR-210-WHT (GC 202)

| Level | Part Number | Description | Qty |
|---|---|---|---|
| 1 | 20-00145-01 | Assy, Panel Mounting - GC202 | 1 |
| 2 | 20-00140-01 | Weldment, Panel Support | 30 |
| 3 | 30-00732-01 | L Angle, Panel Support Bottom | 1 |
| 3 | 30-00737-01 | L Angle, Panel Support Top | 1 |
| 2 | 30-00354-02 | Washer, Flat, English | 60 |
| 2 | 30-00644-01 | Washer, Lock, Internal Tooth | 240 |
| 2 | 30-00645-01 | Nut, Hex | 120 |
| 2 | 30-00681-01 | Ubolt, Square Bend | 30 |
| 2 | 30-00704-02 | Locknut, Hex Nylon Insert | 60 |
| 2 | 30-00750-04 | Bolt, Hex 0.25-20 | 120 |

## Evergreen ES-190/195/200 (GC 203)

| Level | Part Number | Description | Qty |
|---|---|---|---|
| 0 | 20-00149-01 | Assy, Panel Mounting - GC203 | 1 |
| 1 | 20-00142-01 | Weldment, Panel Support | 30 |
| 2 | 30-00732-01 | L Angle, Panel Support Bottom | 1 |
| 2 | 30-00739-01 | L Angle, Panel Support Top | 1 |
| 1 | 30-00354-02 | Washer, Flat, English | 60 |
| 1 | 30-00644-01 | Washer, Lock, Internal Tooth | 240 |
| 1 | 30-00645-01 | Nut, Hex | 120 |
| 1 | 30-00681-01 | Ubolt, Square Bend | 30 |
| 1 | 30-00704-02 | Locknut, Hex Nylon Insert | 60 |
| 1 | 30-00750-04 | Bolt, Hex 0.25-20 | 120 |

# Bill of Materials



## Suntech STP190/200/210-18/Ub (GC 204)

| Level | Part Number | Description | Qty |
|---|---|---|---|
| 1 | 20-00146-01 | Assy, Panel Mounting GC - 204 | 1 |
| 2 | 20-00139-01 | Weldment, Panel Support | 32 |
| 3 | 30-00731-01 | L Angle, Panel Support Top | 1 |
| 3 | 30-00732-01 | L Angle, Panel Support Bottom | 1 |
| 2 | 30-00354-02 | Washer, Flat, English | 64 |
| 2 | 30-00644-01 | Washer, Lock, Internal Tooth | 256 |
| 2 | 30-00645-01 | Nut, Hex | 128 |
| 2 | 30-00681-01 | Ubolt, Square Bend | 32 |
| 2 | 30-00704-02 | Locknut, Hex Nylon Insert | 64 |
| 2 | 30-00750-04 | Bolt, Hex 0.25-20 | 128 |

## Suntech STP170/175/180-24/Ub (GC 205)

| Level | Part Number | Description | Qty |
|---|---|---|---|
| 1 | 20-00151-01 | Assy, Panel Mounting - GC205 | 1 |
| 2 | 20-00140-01 | Weldment, Panel Support | 30 |
| 3 | 30-00732-01 | L Angle, Panel Support Bottom | 1 |
| 3 | 30-00737-01 | L Angle, Panel Support Top | 1 |
| 2 | 30-00354-02 | Washer, Flat, English | 60 |
| 2 | 30-00644-01 | Washer, Lock, Internal Tooth | 240 |
| 2 | 30-00645-01 | Nut, Hex | 120 |
| 2 | 30-00681-01 | Ubolt, Square Bend | 30 |
| 2 | 30-00704-02 | Locknut, Hex Nylon Insert | 60 |
| 2 | 30-00750-04 | Bolt, Hex 0.25-20 | 120 |

## Sharp ND-216U1F (GC 206)

| Level | Part Number | Description | Qty |
|---|---|---|---|
| 1 | 20-00153-01 | Assy, Panel Mounting - GC206 | |
| 2 | 20-00139-01 | Weldment, Panel Support | 28 |
| 3 | 30-00732-01 | L Angle, Panel Support Bottom | 1 |
| 3 | 30-00731-01 | L Angle, Panel Support Top | 1 |
| 2 | 30-00354-02 | Washer, Flat, English | 56 |
| 2 | 30-00644-01 | Washer, Lock, Internal Tooth | 224 |
| 2 | 30-00645-01 | Nut, Hex | 112 |
| 2 | 30-00681-01 | Ubolt, Square Bend | 28 |
| 2 | 30-00704-02 | Locknut, Hex Nylon Insert | 56 |
| 2 | 30-00750-04 | Bolt, Hex 0.25-20 | 112 |

# Bill of Materials



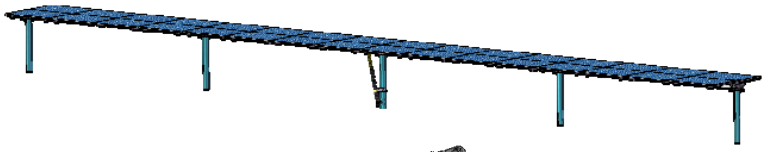
## Kyocera KD205GX LP (GC 207)

| Level | Part Number | Description | Qty |
|---|---|---|---|
| 1 | 20-00154-01 | Assy, Panel Mounting - GC207 | |
| 2 | 20-00139-01 | Weldment, Panel Support | 30 |
| 3 | 30-00732-01 | L Angle, Panel Support Bottom | 1 |
| 3 | 30-00731-01 | L Angle, Panel Support Top | 1 |
| 2 | 30-00354-02 | Washer, Flat, English | 60 |
| 2 | 30-00644-01 | Washer, Lock, Internal Tooth | 240 |
| 2 | 30-00645-01 | Nut, Hex | 120 |
| 2 | 30-00681-01 | Ubolt, Square Bend | 30 |
| 2 | 30-00704-02 | Locknut, Hex Nylon Insert | 60 |
| 2 | 30-00750-04 | Bolt, Hex 0.25-20 | 120 |

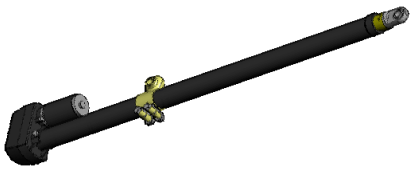
# List of Parts

## Description

**Assembly, RayTracker**



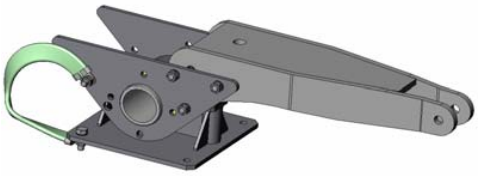
**Assembly, Actuator**



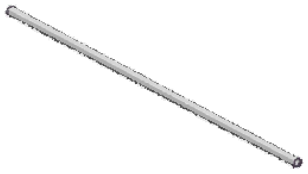
**Assembly, Bearing**



**Assembly, Bearing - Center Post**



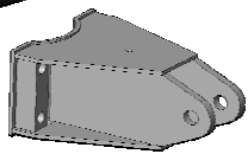
**Assy, Main Beam**



**Weldment, Panel Support**



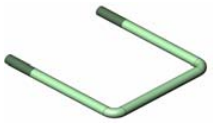
**Weldment, Actuator Clamp**



Parts shown here are not to scale

## Description

**Ubolt, Square Bend**



**Ubolt, Round Bend**



**Plug, Bearing Assembly**



Parts shown here are not to scale