NOTES:
1. THIS DOCUMENT IS INTENDED TO ILLUSTRATE THE APPLICATION OF A 600VAC TRANSFORMER WITH OUTDOOR ENCLOSURE WITH A SOLECTRIA RENEWABLES SGI 500XT INVERTER. EXAMPLES OF THE FOLLOWING ARE GIVEN:
   - INVERTER TO TRANSFORMER CONDUIT ROUTING
   - CONDUIT AND CONDUCTOR SIZING
   - VOLTAGE DROP CALCULATIONS
   - ESTIMATED COSTS

2. THIS DOCUMENT IS NOT INTENDED TO BE USED AS A FINAL DESIGN DOCUMENT. ADDITIONAL ENGINEERING DESIGN IS REQUIRED TO ACCOUNT FOR LOCAL CODE COMPLIANCE AND MANUFACTURER’S INSTALLATION REQUIREMENTS. IN PARTICULAR, CONDUIT ROUTING AND ENCLOSURE PENETRATIONS SHOULD COMPLY WITH MANUFACTURER’S SUGGESTIONS.

3. SUGGESTED TRANSFORMERS WITH OUTDOOR ENCLOSURES ARE LISTED BELOW
   - HAMMOND POWER SOLUTIONS NMK500BP - NEMA 3R ENCLOSURE
   - HAMMOND POWER SOLUTIONS NMK500BPAH8 - NEMA 3R ENHANCED ENCLOSURE

A NEMA 3R ENHANCED ENCLOSURE PROVIDES SUPERIOR PROTECTION TO A NEMA 3R ENCLOSURE BY PREVENTING INGRESS OF CURCULATING DUST AND SNOW. ADDITIONAL TRANSFORMERS WITH OUTDOOR ENCLOSURES CAN BE USED. SEE SOLECTRIA RENEWABLES ESD-ELC-20 FOR FURTHER INFORMATION.
1. EXAMPLE OF INVERTER TO TRANSFORMER CONDUIT ROUTING SHOWN FOR THE FOLLOWING CONFIGURATION:
   - TRANSFORMER ENCLOSURE: NEMA 3R (NMK500BP)
   - CONDUIT LOCATION: SIDE ENTRY
NOTES:
1. EXAMPLE OF INVERTER TO TRANSFORMER CONDUIT ROUTING SHOWN FOR THE FOLLOWING CONFIGURATION:
   - TRANSFORMER ENCLOSURE: NEMA 3R (NMK500BP)
   - CONDUIT LOCATION: UNDERGROUND
NOTES:
1. EXAMPLE OF INVERTER TO TRANSFORMER CONDUIT ROUTING SHOWN FOR THE FOLLOWING CONFIGURATION:
   - TRANSFORMER ENCLOSURE: NEMA 3R ENHANCED (NMK500BPAH8)
   - CONDUIT LOCATION: SIDE ENTRY
NOTES:
1. EXAMPLE OF INVERTER TO TRANSFORMER CONDUIT ROUTING SHOWN FOR THE FOLLOWING CONFIGURATION
   - TRANSFORMER ENCLOSURE: NEMA 3R ENHANCED (NMK500BPAH8)
   - CONDUIT LOCATION: UNDERGROUND
## Conduit Sizing and Cost for Copper Conductors

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>Phase Conductor Size (KCMIL)</td>
<td>Equipment Grounding Conductor Size (KCMIL)</td>
<td>Total Ampacity (A)</td>
<td>Conduit Cross Sectional Area Required, 40% Fill, RHW-2 (mm²)</td>
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<tr>
<td>4</td>
<td>700</td>
<td>250</td>
<td>1840</td>
<td>7576</td>
</tr>
<tr>
<td>5</td>
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<tr>
<td>6</td>
<td>350</td>
<td>250</td>
<td>1860</td>
<td>4823</td>
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</tbody>
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## Conduit Sizing and Cost for Aluminum Conductors

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</thead>
<tbody>
<tr>
<td></td>
<td>Phase Conductor Size (KCMIL)</td>
<td>Equipment Grounding Conductor Size (KCMIL)</td>
<td>Total Ampacity (A)</td>
<td>Conduit Cross Sectional Area Required, 40% Fill, XHHW-2 (mm²)</td>
</tr>
<tr>
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<td>700</td>
<td>400</td>
<td>1875</td>
<td>5734</td>
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<tr>
<td>6</td>
<td>500</td>
<td>400</td>
<td>1860</td>
<td>4312</td>
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</table>

### Table Footnotes:
1. 30°C Ambient Temperature, 75°C Conductors and Termination Temperature, Not More Than (3) Current Carrying Conductors in a Raceway
2. One EGC per Conduit, 1800A OCPD
3. 25 Foot Run, Includes Conductors, Conduit, Basic Fittings and External Transformer with NEMA 3R Rating
4. 25 Foot Run, Includes Conductors, Conduit, Basic Fittings and External Transformer with Enhanced NEMA 3R Rating

[^3]: ISO 9004:2014 Rev. A
[^4]: ISO 9004:2014 Rev. A

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**NOTE:** All information contained within this document is subject to change without notice.
## VOLTAGE DROP CALCULATIONS

### VOLTAGE DROP FOR COPPER CONDUCTORS

<table>
<thead>
<tr>
<th>NUMBER OF PARALLEL SETS OF (3) PHASE CONDUCTORS</th>
<th>PHASE CONDUCTOR SIZE (KCMIL)</th>
<th>EQUIPMENT GROUNDING CONDUCTOR SIZE (KCMIL)</th>
<th>TOTAL AMPACITY (A)</th>
<th>PVC CONDUIT</th>
<th>ALUMINUM CONDUIT</th>
<th>STEEL CONDUIT</th>
<th>PVC CONDUIT</th>
<th>ALUMINUM CONDUIT</th>
<th>STEEL CONDUIT</th>
<th>PVC CONDUIT</th>
<th>ALUMINUM CONDUIT</th>
<th>STEEL CONDUIT</th>
<th>PVC CONDUIT</th>
<th>ALUMINUM CONDUIT</th>
<th>STEEL CONDUIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>700</td>
<td>250</td>
<td>1840</td>
<td>0.02%</td>
<td>0.02%</td>
<td>0.02%</td>
<td>0.05%</td>
<td>0.06%</td>
<td>0.05%</td>
<td>0.19%</td>
<td>0.24%</td>
<td>0.21%</td>
<td>0.23%</td>
<td>0.26%</td>
<td>0.23%</td>
</tr>
<tr>
<td>5</td>
<td>500</td>
<td>250</td>
<td>1900</td>
<td>0.02%</td>
<td>0.03%</td>
<td>0.02%</td>
<td>0.05%</td>
<td>0.06%</td>
<td>0.06%</td>
<td>0.22%</td>
<td>0.26%</td>
<td>0.23%</td>
<td>0.26%</td>
<td>0.29%</td>
<td>0.30%</td>
</tr>
<tr>
<td>6</td>
<td>350</td>
<td>250</td>
<td>1860</td>
<td>0.03%</td>
<td>0.03%</td>
<td>0.03%</td>
<td>0.06%</td>
<td>0.07%</td>
<td>0.07%</td>
<td>0.25%</td>
<td>0.29%</td>
<td>0.26%</td>
<td>0.29%</td>
<td>0.32%</td>
<td>0.30%</td>
</tr>
</tbody>
</table>

### VOLTAGE DROP FOR ALUMINUM CONDUCTORS

| NUMBER OF PARALLEL SETS OF (3) PHASE CONDUCTORS | PHASE CONDUCTOR SIZE (KCMIL) | EQUIPMENT GROUNDING CONDUCTOR SIZE (KCMIL) | TOTAL AMPACITY (A) | PVC CONDUIT | ALUMINUM CONDUIT | STEEL CONDUIT | PVC CONDUIT | ALUMINUM CONDUIT | STEEL CONDUIT | PVC CONDUIT | ALUMINUM CONDUIT | STEEL CONDUIT | PVC CONDUIT | ALUMINUM CONDUIT | STEEL CONDUIT | PVC CONDUIT | ALUMINUM CONDUIT | STEEL CONDUIT | PVC CONDUIT | ALUMINUM CONDUIT | STEEL CONDUIT |
|-------------------------------------------------|-------------------------------|---------------------------------------------|-------------------|-------------|-----------------|--------------|-------------|-----------------|--------------|-------------|-----------------|--------------|-------------|-----------------|--------------|
| 5                                               | 700                           | 400                                         | 1875              | 0.02%       | 0.03%           | 0.02%        | 0.06%       | 0.07%           | 0.06%        | 0.23%       | 0.27%           | 0.25%        | 0.30%       | 0.30%           | 0.30%        | 0.30%       | 0.30%           | 0.30%        |
| 6                                               | 500                           | 400                                         | 1860              | 0.03%       | 0.03%           | 0.03%        | 0.07%       | 0.08%           | 0.08%        | 0.29%       | 0.32%           | 0.30%        | 0.30%       | 0.30%           | 0.30%        | 0.30%       | 0.30%           | 0.30%        |

### TABLE FOOTNOTES:

1. **30°C AMBIENT TEMPERATURE, 75°C CONDUCTORS AND TERMINATION TEMPERATURE, NOT MORE THAN (3) CURRENT-CARRYING CONDUCTORS IN A RACEWAY**
2. **500KW, POWER FACTOR OF 1.0, NOMINAL SYSTEM VOLTAGE OF 600VAC, BALANCED SYSTEM**
SUGGESTED TRANSFORMER WITH OUTDOOR ENCLOSURE DETAILS

NOTES:
1. FOR ADDITIONAL INFORMATION CONTACT TRANSFORMER MANUFACTURER.

INFORMATION FROM:
Hammond Power Solutions Inc.

TRANSFORMER TERMINAL SPECIFICATIONS

H.V.1. TERMINAL DETAIL
L.V.1. TERMINAL DETAIL

MECHANICAL TYPE LUGS INCLUDED SUITABLE FOR 3/0-2/0 AL CONDUCTORS
2 CONDUCTORS PER PHASE

CUSTOMER NOTES:
- H.V1 TERMINATED AT TOP FRONT
- L.V1 TERMINATED AT BOTTOM FRONT

TRANSFORMER NAMEPLATE

Hammond Power Solutions Inc.

ENERGY EFFICIENT GENERAL PURPOSE DISTRIBUTION ISOLATION TRANSFORMER

600Y/346V

H0 H1 H2 H3

208V

X1 X2 X3

2500

NEMA SENTINEL

NEMA 3R ENCLOSURE SPECIFICATIONS

NEMA 3R ENHANCED ENCLOSURE SPECIFICATIONS

FOR ADDITIONAL INFORMATION CONTACT TRANSFORMER MANUFACTURER.

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