



BUILDING-INTEGRATED SOLAR TECHNOLOGY

MITREX

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SOLAR EQUIPMENT & SPACE REQUIREMENT

MITREX SOLAR FACADE
MODULES

1. INTRODUCTION

Photovoltaic systems offer a promising solution to combat global warming while providing sustainable energy for the future. In utility scales, solar farms are prevalent and interconnected with the grid. For enhanced efficiency and reduced loss, it is beneficial to have load and generation sources situated close to each other. Solar projects implemented in or on buildings are particularly advantageous as they harness most of the solar energy for immediate use within the building. This approach not only minimizes losses but also alleviates congestion in transmission and distribution lines.

2. FOR BUILDING OWNERS

A crucial concern for building owners is the electrical equipment required for solar projects. Beyond cost considerations, they worry about the space these equipment installations demand. This document addresses the necessary equipment for various PV project sizes and scenarios.

3. LOGISTICS CONSIDERATIONS

BIPV (Building Integrated Photovoltaics) and regular rooftop solar installations as BAPV (Building applied photovoltaics) differ in terms of installation locations, solar panel types, and mounting equipment. However, both BIPV and BAPV systems share similar components apart from the solar panels. In rooftop projects, a designated area on the flat or tilted roof is necessary. In contrast, BIPV panels replace specific building elements such as facades, windows, railings, and so on, eliminating the need for additional space.

Additional equipment, such as AC equipment, requires some space on the roof, wall, or inside the building (like electrical or mechanical room). The specific requirements for AC equipment depend on factors such as the system size, number of electricity phases (single phase or three phases), maximum DC voltages allowed in the building, and local distribution company (LDC) regulations. When inverters are placed inside the building, DC cables need to be carefully routed through conduits, necessitating penetration points in the structure. The number and size of conduits vary according to each scenario, as detailed in the accompanying table.

4. REQUIRED AC EQUIPMENT FOR DIFFERENT SCENARIOS

Mitrex Panels, both BIPV and BAPV, are suitable for a 1000V system voltage. However, certain buildings may be restricted to a maximum of 600V DC based on local codes. Electricity services typically operate at 240V single phase or 208V, 480V, and 600V three phases. The table below outlines the required AC equipment for all the aforementioned scenarios, considering different system sizes.

| | | 600V DC MAX SYSTEM | | | |
|-------------|--------------|---------------------------|-------------------------|--------------------------------|--------------------------------|
| # OF PHASES | SINGLE PHASE | THREE PHASE | | | |
| VOLTAGE | 240V | 208V | 480V | 600V | |
| 5kW | Inverter | Solaredge SE5000H-US | --- | --- | --- |
| | Disconnect | 240V 30A Disconnect | --- | --- | --- |
| | Panelboard | --- | --- | --- | --- |
| | Transformer | --- | --- | --- | --- |
| | Conduit | 1" Conduit | --- | --- | --- |
| | SCADA | --- | --- | --- | --- |
| 10kW | Inverter | Solaredge SE10000H-US | Solaredge SE10KUS | Fronius Symo 15.0-3 | Solaredge SE10KUS |
| | Disconnect | 240V 60A Disconnect | 240V 60A Disconnect | 600V 30A Disconnect x 2 | 600V 30A Disconnect x 3 |
| | Panelboard | --- | --- | --- | --- |
| | Transformer | --- | --- | --- | 600V/208V 15kVA TX |
| | Conduit | 1 1/4" Conduit | 1 1/4" Conduit | 1 1/2" Conduit | 1 1/4" Conduit |
| | SCADA | --- | --- | --- | --- |
| 20kW | Inverter | Solaredge SE10000H-US x 2 | Solaredge SE10KUS x 2 | Fronius Symo 20.0-3 | Solaredge SE10KUS x 2 |
| | Disconnect | 240V 200A Disconnect | 240V 100A Disconnect | 600V 30A Disconnect x 2 | 600V 30A Disconnect x 2 |
| | Panelboard | 240V 200A Panel | 240V 100A Panel | --- | 600V 100A Panel |
| | Transformer | --- | --- | --- | 600V/208V 30kVA TX |
| | Conduit | 1 1/2" Conduit | 2" Conduit | 1 1/2" Conduit | 2" Conduit |
| | SCADA | --- | --- | --- | --- |
| 50kW | Inverter | --- | Solaredge SE17.3KUS x 3 | SMA Core1 33.3kW x 2 | SMA Core1 33.3kW x 2 |
| | Disconnect | --- | 240V 200A Disconnect | 600V 60A Disconnect x 2 | 600V 60A Disconnect x 2 |
| | Panelboard | --- | 240V 200A Panel | 600V 100A Panel | 600V 100A Panel |
| | Transformer | --- | --- | --- | 600V/480V 75kVA TX |
| | Conduit | --- | 2" Conduit | 3" or 2 x 2" Conduit | 3" or 2 x 2" Conduit |
| | SCADA | --- | Depends on the Hydro | Depends on the Hydro | Depends on the Hydro |
| 100kW | Inverter | --- | Solaredge SE17.3KUS x 6 | SMA Core1 33.3kW x 3 | SMA Core1 33.3kW x 3 |
| | Disconnect | --- | 240V 400A Disconnect | 600V 200A Disconnect x 2 | 600V 200A Disconnect x 2 |
| | Panelboard | --- | 240V 400A Panel | 600V 200A Panel | 600V 200A Panel |
| | Transformer | --- | --- | --- | 600V/480V 150kVA TX |
| | Conduit | --- | 3" or 2 x 2" Conduit | 4" or 2 x 3" or 3 x 2" Conduit | 4" or 2 x 3" or 3 x 2" Conduit |
| | SCADA | --- | Depends on the Hydro | Depends on the Hydro | Depends on the Hydro |
| 500kW | Inverter | --- | --- | SMA Core1 33.3kW x 15 | SMA Core1 33.3kW x 15 |
| | Disconnect | --- | --- | 600V 600A Disconnect x 2 | 600V 600A Disconnect x 2 |
| | Panelboard | --- | --- | 600V 800A Panel | 600V 800A Panel |
| | Transformer | --- | --- | --- | 600V/480V 500kVA TX |
| | Conduit | --- | --- | 5 x 4" Conduit | 5 x 4" Conduit |
| | SCADA | --- | --- | Depends on the Hydro | Depends on the Hydro |

| | | 1000V DC MAX SYSTEM | | | |
|-------------|--------------|--------------------------|--------------------------------|----------------------------------|----------------------------------|
| # OF PHASES | SINGLE PHASE | THREE PHASE | | | |
| VOLTAGE | 240V | 208V | 480V | 600V | |
| 5kW | Inverter | Fronius Primo 5.0-1 | --- | --- | --- |
| | Disconnect | 240V 30A Disconnect | --- | --- | --- |
| | Panelboard | --- | --- | --- | --- |
| | Transformer | --- | --- | --- | --- |
| | Conduit | 1 1/4" Conduit | --- | --- | --- |
| | SCADA | --- | --- | --- | --- |
| 10kW | Inverter | Fronius Primo 10.0-1 | Fronius Symo 10.0-3 (208V) | Fronius Symo 10.0-3 | Fronius Symo 10.0-3 |
| | Disconnect | 240V 60A Disconnect | 240V 60A Disconnect | 600V 30A Disconnect x 2 | 600V 30A Disconnect x 3 |
| | Panelboard | --- | --- | --- | --- |
| | Transformer | --- | --- | --- | 600V/480V 15kVA TX |
| | Conduit | 1 1/2" Conduit | 1 1/2" Conduit | 1 1/2" Conduit | 1 1/2" Conduit |
| | SCADA | --- | --- | --- | --- |
| 20kW | Inverter | Fronius Primo 10.0-1 x 2 | Fronius Symo 10.0-3 (208V) x 2 | Fronius Symo 20.0-3 | Fronius Symo 20.0-3 |
| | Disconnect | 240V 200A Disconnect | 240V 100A Disconnect | 600V 30A Disconnect x 2 | 600V 30A Disconnect x 3 |
| | Panelboard | 240V 200A Panel | 240V 100A Panel | --- | --- |
| | Transformer | --- | --- | --- | 600V/480V 30kVA TX |
| | Conduit | 2" Conduit | 2" Conduit | 1 1/2" Conduit | 1 1/2" Conduit |
| | SCADA | --- | --- | --- | --- |
| 50kW | Inverter | --- | Fronius Symo 15.0-3 (208V) x 3 | SMA Corel 50kW | SMA Corel 50kW |
| | Disconnect | --- | 240V 200A Disconnect | 600V 60A Disconnect x 2 | 600V 60A Disconnect x 3 |
| | Panelboard | --- | 240V 200A Panel | --- | --- |
| | Transformer | --- | --- | --- | 600V/480V 75kVA TX |
| | Conduit | --- | 3" or 2 x 2" Conduit | 1 1/2" Conduit | 1 1/2" Conduit |
| | SCADA | --- | Depends on the Hydro | Depends on the Hydro | Depends on the Hydro |
| 100kW | Inverter | --- | Fronius Symo 15.0-3 (208V) x 7 | Solaredge SE100KUS | Solaredge SE100KUS |
| | Disconnect | --- | 240V 400A Disconnect | 600V 200A Disconnect x 2 | 600V 200A Disconnect x 3 |
| | Panelboard | --- | 240V 400A Panel | --- | --- |
| | Transformer | --- | --- | --- | 600V/480V 150kVA TX |
| | Conduit | --- | 4" or 2 x 3" or 4 x 2" Conduit | 2 1/2" or 2 x 1 1/2" PVC Conduit | 2 1/2" or 2 x 1 1/2" PVC Conduit |
| | SCADA | --- | Depends on the Hydro | Depends on the Hydro | Depends on the Hydro |
| 500kW | Inverter | --- | --- | Solaredge SE100KUS x 5 | Solaredge SE100KUS x 5 |
| | Disconnect | --- | --- | 600V 600A Disconnect x 2 | 600V 600A Disconnect x 2 |
| | Panelboard | --- | --- | 600V 800A Panel | 600V 800A Panel |
| | Transformer | --- | --- | 600V/480V 500kVA TX | 600V/480V 500kVA TX |
| | Conduit | --- | --- | 2 x 4" or 5 x 2 1/2" Conduit | 2 x 4" or 5 x 2 1/2" Conduit |
| | SCADA | --- | --- | Depends on the Hydro | Depends on the Hydro |

CASE STUDY

50KW SYSTEM ON INDUSTRIAL BUILDING

BUILDING TYPE:

Industrial building with 240 panels of 250W (total 60 kW DC)

SYSTEM SIZE:

3 x 17.3kW Solaredge inverter SE17.3KUS

SYSTEM LAYOUT:

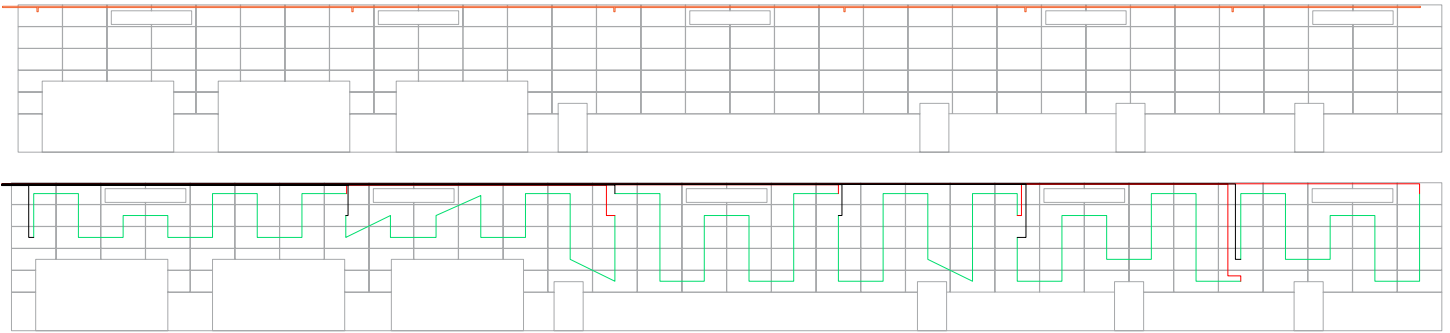
12 strings of 20 panels with one building penetration holes (Conduit size 2")

PROJECT SOLAR EQUIPMENT:

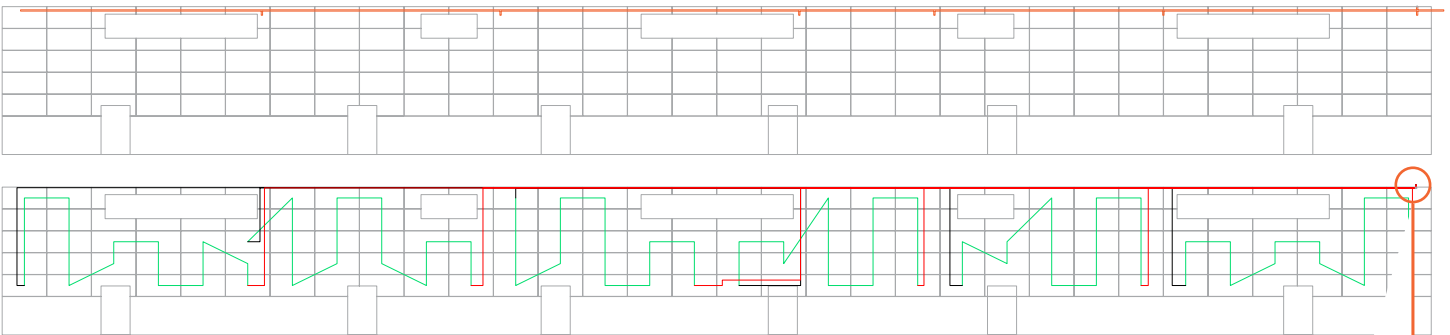
One AC Panelboard 200A 240V, two 200A 240V disconnect switches (One could be replaced with breaker inside the main building switchboard if available)

50kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING ROOFTOP

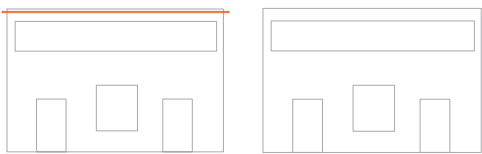
EAST ELEVATION



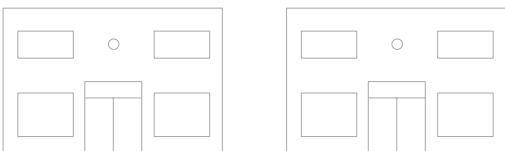
WEST ELEVATION



NORTH ELEVATION

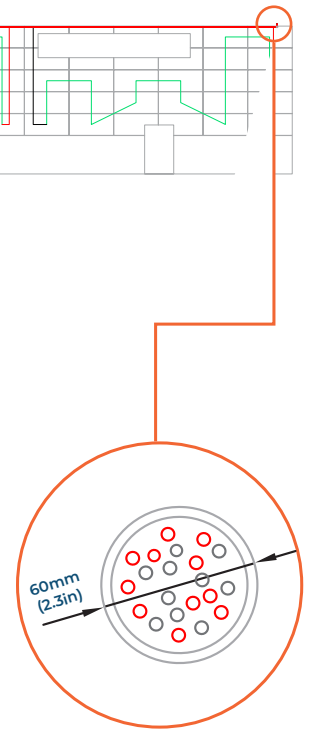


SOUTH ELEVATION



LINE COLOUR REFERENCE

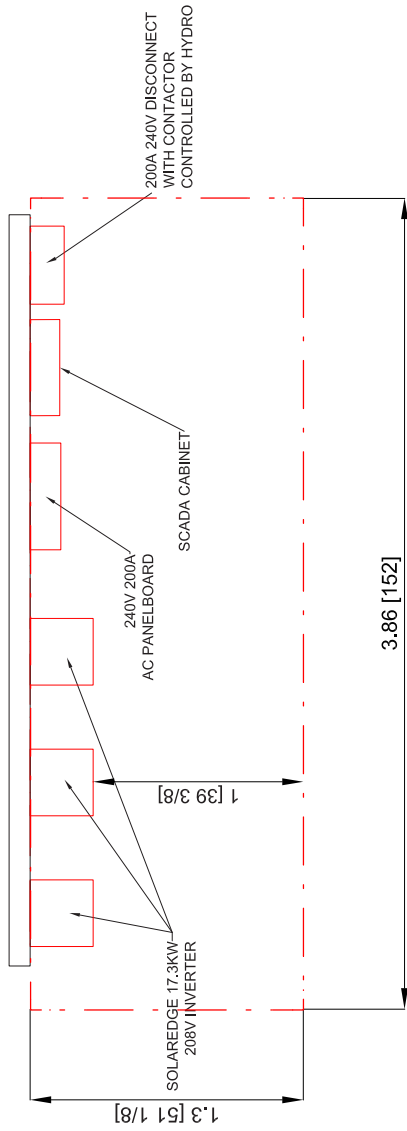
- Building & solar panels layout
- Conduit layout
- Electrical strings
- Home run wiring



BUILDING PENETRATION FOR CONDUIT TO INVERTER

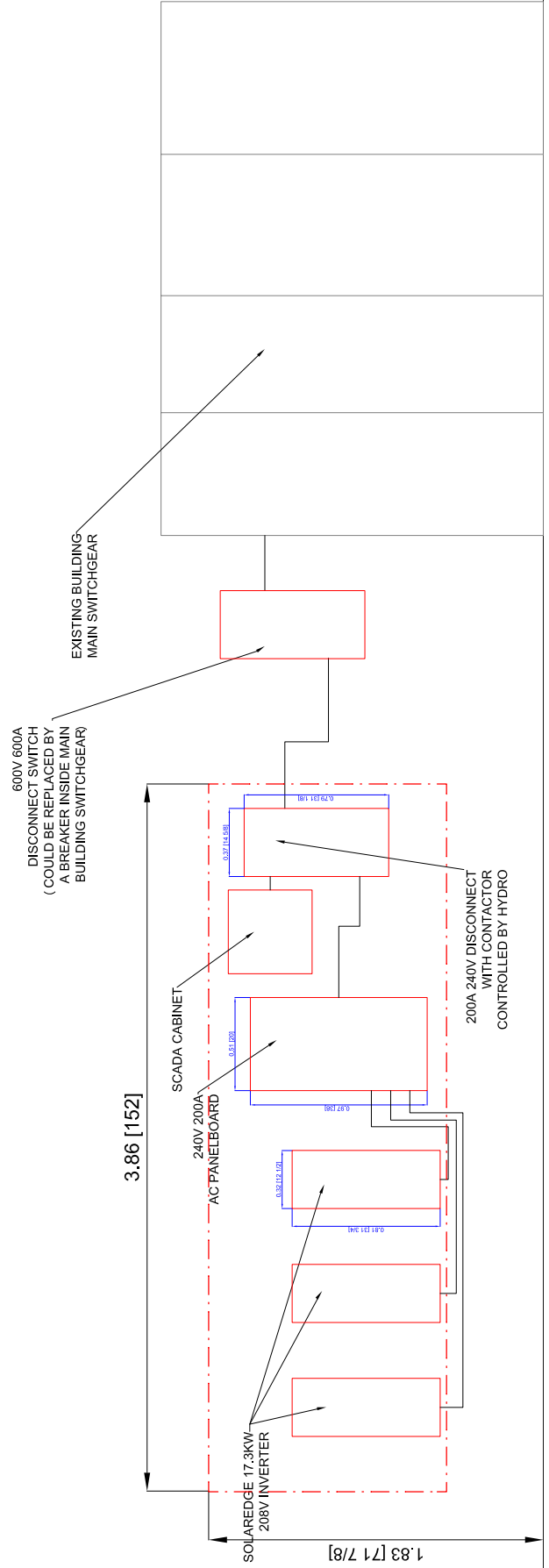
500kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING ROOFTOP

TOP VIEW



Note: Working area is 1m (39.37in) in front of solar equipments as per electrical code.

FRONT VIEW



Three Phase Inverters for the 120/208V Grid For North America

SE10KUS / SE17.3KUS



The best choice for SolarEdge enabled systems

- Specifically designed to work with power optimizers
- Quick and easy inverter commissioning directly from a smartphone using SolarEdge SetApp
- Fixed voltage inverter for superior efficiency and longer strings
- Built-in type 2 DC and AC Surge Protection, to better withstand lightning events
- Small, lightest in its class, and easy to install outdoors or indoors on provided bracket
- Integrated arc fault protection and rapid shutdown for NEC 2014, 2017, and 2020, per article 690.11 and 690.12
- Built-in module-level monitoring with Ethernet, wireless or cellular communication for full system visibility
- Integrated Safety Switch
- UL1741 SA and SB certified, for CPUC Rule 21 grid compliance

/ Three Phase Inverters for the 120/208V Grid⁽¹⁾

For North America

SE10KUS / SE17.3KUS

| Model Number | SE10KUS | SE17.3KUS | |
|---|---|-----------|-----|
| Applicable to inverters with part number | SEXK-USX21XXXX | | |
| OUTPUT | | | |
| Rated AC Power Output | 10000 | 17300 | W |
| Maximum Apparent AC Output Power | 10000 | 17300 | VA |
| AC Output Line Connections | 3W + PE, 4W + PE | | |
| AC Output Voltage Minimum-Nominal-Maximum ⁽²⁾ (L-N) | 105 – 120 – 132.5 | | |
| AC Output Voltage Minimum-Nominal-Maximum ⁽²⁾ (L-L) | 183 – 208 – 229 | | |
| AC Frequency Minimum-Nominal-Maximum ⁽²⁾ | 59.3 – 60 – 60.5 | | |
| Continuous Output Current (per Phase) | 27.8 | 48.25 | Aac |
| GFDI Threshold | 1 | | |
| Utility Monitoring, Islanding Protection, Country Configurable Set Points | Yes | | |
| THD | ≤ 3 | | |
| Power Factor Range | +/- 0.85 to 1 | | |
| INPUT | | | |
| Maximum DC Power (Module STC) | 17500 | 30275 | W |
| Transformer-less, Ungrounded | Yes | | |
| Maximum Input Voltage DC+ to DC- | 600 | | |
| Operating Voltage Range | 370 – 600 | | |
| Maximum Input Current | 27.8 | 48.25 | Adc |
| Maximum Input Short Circuit Current | 55 | | |
| Reverse-Polarity Protection | Yes | | |
| Ground-Fault Isolation Detection | 167kΩ Sensitivity ⁽³⁾ | | |
| CEC Weighted Efficiency | 97 | 97.5 | % |
| Night-time Power Consumption | < 4 | | |
| ADDITIONAL FEATURES | | | |
| Supported Communication Interfaces | 2 x RS485, Ethernet, Cellular (optional) | | |
| Inverter Commissioning | With the SetApp mobile application using built-in Wi-Fi access point for local connection | | |
| Rapid Shutdown | NEC2014, NEC2017 and NEC2020 compliant/certified | | |
| RS485 Surge Protection Plug-in | Supplied with the inverter, Built-in | | |
| AC, DC Surge Protection | Type II, field replaceable, Built-in | | |
| DC Fuses (Single Pole) | 25A, Built-in | | |
| Smart Energy Management | Export Limitation | | |
| DC SAFETY SWITCH | | | |
| DC Disconnect | Integrated | | |
| STANDARD COMPLIANCE | | | |
| Safety | UL1741, UL1741 SA, UL1741 SB, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07 | | |
| Grid Connection Standards | IEEE1547-2018, Rule 21, Rule 14 (HI) | | |
| Emissions | FCC part15 class A | | |
| INSTALLATION SPECIFICATIONS | | | |
| AC Output Conduit size /AWG range | ¾" or 1" / 6 - 10 AWG | | |
| DC Input Conduit size / AWG range | ¾" or 1" / 6 - 12 AWG | | |
| Number of DC inputs pairs | 4 | | |
| Dimensions with Safety Switch (H x W x D) | 31.8 x 12.5 x 11.8 / 808 x 317 x 300 | | |
| Weight with Safety Switch | 78.2 / 35.5 | | |
| Cooling | Fans (user replaceable) | | |
| Noise | < 62 | | |
| Operating Temperature Range | -40 to +140 / -40 to +60(4) | | |
| Protection Rating | NEMA 3R | | |
| Mounting | Bracket provided | | |

(1) For 277/480V inverters refer to the [Three Phase Inverters for the 277/480V Grid for North America datasheet](#).

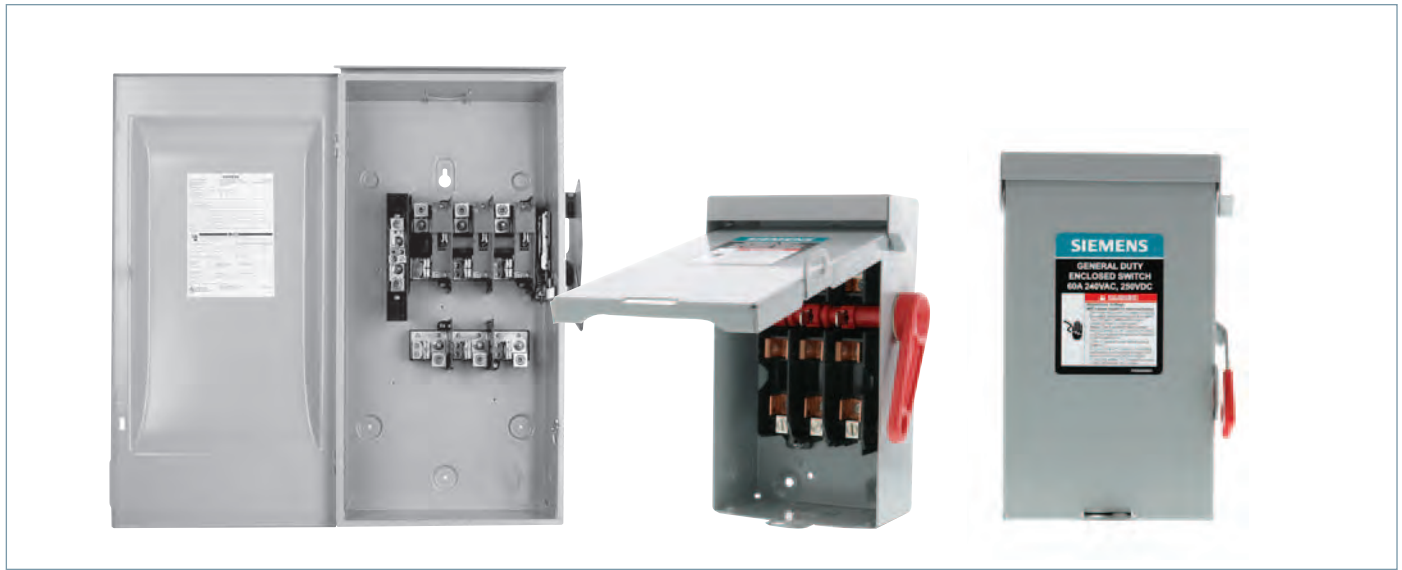
(2) For other regional settings please contact SolarEdge support.

(3) Where permitted by local regulations.

(4) For power de-rating information refer to the [Temperature De-rating - Technical Note \(North America\)](#).

General Duty Safety Switches

Selection



4 SAFETY SWITCHES

| System | Ampere Rating | Indoor — Type 1 | | Outdoor — Type 3R | | Horsepower Rating ^① | | | | | | |
|--------|---------------|-----------------|--------------------------|-------------------|--------------------------|--------------------------------|-----------------|-----------------|------|------|------|------|
| | | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 240V AC | | 250 Volt DC | | | | |
| | | | | | | 1-Phase, 2-Wire | 2-Phase, 4-Wire | 3-Phase, 3-Wire | Std. | Max. | Std. | Max. |

240 Volt Fusible^①

2-Pole, 2-Fuse, and Solid Neutral^{②③④}

240 Volt AC/250 Volt DC

| | | | | | | | | | | | | |
|--|-----|---------|-----------------|-----------------------|-----------------|----|----|---|---|----|----|----|
| | 30 | GF221NA | 30 ^⑦ | GF221NRA ^⑤ | 30 ^⑦ | 1½ | 3 | — | — | 3 | 7½ | 5 |
| | 60 | GF222NA | 20 ^⑥ | GF222NRA ^⑤ | 20 ^⑥ | 3 | 10 | — | — | 7½ | 15 | 10 |
| | 100 | GF223N | 23 | GF223NR | 23 | 7½ | 15 | — | — | 15 | 30 | 20 |
| | 200 | GF224N | 47 | GF224NR | 48 | 15 | — | — | — | 25 | 60 | 40 |

3-Pole, 3-Fuse, and Solid Neutral^④

240 Volt AC/250 Volt DC

| | | | | | | | | | | | | |
|--|-----|---------|-----------------|-----------------------|-----------------|----|----|---|---|----|-----|----|
| | 30 | GF321NA | 30 ^⑦ | GF321NRA ^⑤ | 30 ^⑦ | 1½ | 3 | — | — | 3 | 7½ | 5 |
| | 60 | GF322NA | 20 ^⑥ | GF322NRA ^⑤ | 20 ^⑥ | 3 | 10 | — | — | 7½ | 15 | 10 |
| | 100 | GF323N | 25 | GF323NR | 25 | 7½ | 15 | — | — | 15 | 30 | 20 |
| | 200 | GF324N | 49 | GF324NR | 50 | 15 | — | — | — | 25 | 60 | 40 |
| | 400 | GF325NA | 94.6 | GF325NRA | 94.6 | 15 | — | — | — | 50 | 125 | 50 |
| | 600 | GF326NA | 95.6 | GF326NRA | 95.6 | 15 | — | — | — | 75 | 200 | — |

240 Volt Non-Fusible^{③④⑪}

2-Pole or 3-Pole

240 Volt AC/250 Volt DC

| | | | | | | | | | | | | |
|--|-----|-----------------------|-----------------|----------------------------|-----------------|---|----|---|---|-----|---|----|
| | 30 | GNF221A | 20 ^⑦ | GNF221RA ^⑤ | 20 ^⑦ | — | 3 | — | — | — | — | 5 |
| | 30 | GNF321A ^⑨ | 20 ^⑦ | GNF321RA ^{⑤⑩} | 20 ^⑦ | — | 3 | — | — | 7½ | — | 5 |
| | 30 | GNF321LA ^⑩ | 30 ^⑦ | GNF321RLA ^{⑤⑩} | 30 ^⑦ | — | 3 | — | — | 7½ | — | 5 |
| | 60 | GNF222A | 30 ^⑦ | GNF222RA ^⑤ | 30 ^⑦ | — | 10 | — | — | 15 | — | 10 |
| | 60 | GNF322A | 30 ^⑦ | GNF322RA ^⑤ | 30 ^⑦ | — | 10 | — | — | 15 | — | 10 |
| | 100 | GNF323 | 23 | GNF323R | 24 | — | 15 | — | — | 30 | — | 20 |
| | 200 | GNF324 | 46 | GNF324R | 47 | — | 15 | — | — | 60 | — | 40 |
| | 400 | GNF325A | 114 | Use 600V Switch — HNF365RA | — | — | 15 | — | — | 125 | — | 50 |
| | 600 | GNF326A | 116 | Use 600V Switch — HNF366RA | — | — | 15 | — | — | 200 | — | — |

① Dual horsepower ratings: Std.- applies when non-time delay fuses are installed. Max.- applies when time-delay fuses are installed.
 ② These switches are UL-listed for application on grounded B-phase systems.
 ③ Suitable for use on 3-phase motor loads.

④ Service entrance labeled.
 ⑤ Has provision for ECHA type hub.
 ⑥ 5 switches per standard package.
 ⑦ 10 switches per standard package.
 ⑧ Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

⑨ Not suitable for service entrance.
 ⑩ Indicates oversized enclosure.
 ⑪ Internal shields for 30A to 200A switches to meet 2020 NEC 230.62 touch safe requirements for service entrance equipment can be purchased separately. See accessory section for catalog numbers.

General and Heavy Duty Safety Switches

Dimensions

Safety Switch Dimensions (Inches)* & Shipping Weights

| Catalog Number | Height | | | Width | | Depth | | Knockout Diagram ^① | Shipping Weight (lbs.) |
|---------------------|--------|-------------|------------------|-------|---------------|-------|---------------|-------------------------------|------------------------|
| | Box A | With Door B | With Rain Shed C | Box D | With Handle E | Box F | With Handle G | | |
| GF221NA | 8.4 | 8.56 | — | 5.08 | 5.44 | 2.93 | 3.96 | S4 | 30(10) |
| GF221NRA | 8.4 | 8.56 | 8.56 | 5.08 | 5.44 | 2.93 | 3.96 | S5 | 30(10) |
| GF222NA | 9.91 | 10.07 | — | 6.06 | 6.42 | 3.21 | 4.24 | S21 | 20(5) |
| GF222NRA | 9.91 | 10.07 | 10.07 | 6.06 | 6.42 | 3.21 | 4.24 | S22 | 20(5) |
| GF223N | 21.95 | 23.15 | — | 9.64 | 11.7 | 5.05 | 8.63 | S10 | 23 |
| GF223NR | 21.95 | — | 23.46 | 9.64 | 11.67 | 5.05 | 8.7 | S11 | 24 |
| GF224N | 29.9 | 31.07 | — | 14.62 | 16.68 | 6.36 | 10.92 | S12 | 47 |
| GF224NR | 29.9 | — | 31.42 | 14.61 | 16.68 | 6.36 | 10.92 | S13 | 48 |
| GF225NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 91.1 |
| GF225NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 91.1 |
| GF226NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 95.6 |
| GF226NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 95.6 |
| GF321NA | 8.4 | 8.56 | — | 5.08 | 5.44 | 2.93 | 3.96 | S4 | 30(10) |
| GF321NRA | 8.4 | 8.56 | 8.56 | 5.08 | 5.44 | 2.93 | 3.96 | S5 | 30(10) |
| GF322NA | 9.91 | 10.07 | — | 6.06 | 6.42 | 3.21 | 4.24 | S21 | 20(5) |
| GF322NRA | 9.91 | 10.07 | 10.07 | 6.06 | 6.42 | 3.21 | 4.24 | S22 | 20(5) |
| GF323N | 21.95 | 23.15 | — | 9.64 | 11.7 | 5.05 | 8.63 | S10 | 25 |
| GF323NR | 21.95 | — | 23.46 | 9.64 | 11.67 | 5.05 | 8.7 | S11 | 25 |
| GF324N | 29.9 | 31.07 | — | 14.62 | 16.68 | 6.36 | 10.92 | S12 | 49 |
| GF324NR | 29.9 | — | 31.42 | 14.61 | 16.68 | 6.36 | 10.92 | S13 | 50 |
| GF325NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 94.6 |
| GF325NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 94.6 |
| GF326NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 99.6 |
| GF326NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 99.6 |
| GNF221A | 6.18 | 6.35 | — | 4.2 | 4.56 | 2.88 | 3.93 | S4 | 20(10) |
| GNF221RA | 6.18 | 6.35 | 6.35 | 4.2 | 4.56 | 2.88 | 3.93 | S5 | 20(10) |
| GNF321LA | 8.4 | 8.56 | — | 5.08 | 5.43 | 2.93 | 3.95 | S4 | 30(10) |
| GNF321RLA | 8.4 | 8.56 | 8.56 | 5.08 | 5.43 | 2.93 | 3.95 | S5 | 30(10) |
| GNF222A | 8.4 | 8.56 | — | 5.08 | 5.43 | 2.93 | 3.95 | S4 | 30(10) |
| LNF222RA | 8.4 | 8.56 | 8.56 | 5.08 | 5.43 | 2.93 | 3.95 | S20 | 30(10) |
| GNF222RA | 8.4 | 8.56 | 8.56 | 5.08 | 5.43 | 2.93 | 3.95 | S5 | 30(10) |
| GNF321A | 6.18 | 6.35 | — | 4.2 | 4.56 | 2.88 | 3.93 | S4 | 20(10) |
| GNF321RA | 6.18 | 6.35 | 6.35 | 4.2 | 4.56 | 2.88 | 3.93 | S5 | 20(10) |
| GNF322A | 8.4 | 8.56 | — | 5.08 | 5.43 | 2.93 | 3.95 | S4 | 30(10) |
| GNF322RA | 8.4 | 8.56 | 8.56 | 5.08 | 5.43 | 2.93 | 3.95 | S5 | 30(10) |
| GNF323 | 21.95 | 23.15 | — | 9.64 | 11.7 | 5.05 | 8.63 | S10 | 23 |
| GNF323R | 21.95 | — | 23.46 | 9.64 | 11.67 | 5.05 | 8.7 | S11 | 24 |
| GNF324 | 29.9 | 31.07 | — | 14.62 | 16.68 | 6.36 | 10.92 | S12 | 46 |
| GNF324R | 29.9 | — | 31.42 | 14.61 | 16.68 | 6.36 | 10.92 | S13 | 47 |
| GNF325A | 33.47 | 33.96 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 75 |
| GNF326A | 33.47 | 33.96 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 77 |
| HF221J also HF261J | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 13 |
| HF221N also HF261 | 14.26 | 15.45 | — | 6.64 | 9.01 | 5.05 | 10.17 | S6 | 12 |
| HF221NR also HF261R | 14.39 | — | 15.77 | 6.64 | 9.01 | 5.05 | 10.17 | S8 | 13 |
| HF221S also HF261S | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 13 |
| HF222J also HF262J | 16.22 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 19 |
| HF222N also HF262 | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 18 |
| HF222NR also HF262R | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 19 |
| HF222S also HF262S | 16.22 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 19 |
| HF223J also HF263J | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 24 |
| HF223N also HF263 | 21.95 | 23.15 | — | 9.64 | 12.01 | 5.05 | 10.17 | S10 | 23 |
| HF223NR also HF263R | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 24 |

*For inches / millimeters conversion, multiply inches by 25.4.

① Knocks not provided on Type 4 / 4X and 12 or in 800 & 1200A switches.

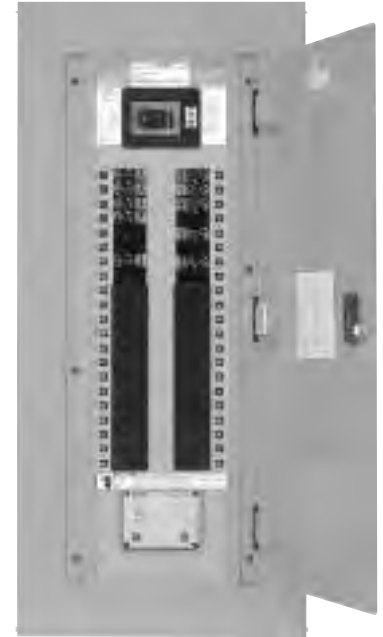
Application

Type P1 Panelboards

Table P1-3 – Main Breaker Panel Size Selector

| Maximum Ampere Rating | Main Breaker Types | Max. No. of Poles | Dimensions in Inches (mm) | | |
|-----------------------|---------------------------------|-------------------|---------------------------|--------------|---------------------|
| | | | Unit Space A | Box Height B | Weight In lbs. (kg) |
| 100 | BL, BLH | 18 30 42 | 9 (229) | 32 (813) | 105 (48) |
| | HBL | | 15 (381) | 38 (965) | 120 (55) |
| | BQD | | 21 (533) | 44 (1118) | 135 (61) |
| 125 | NGB | | 9 (229) | 32 (813) | 110 (50) |
| | | | 15 (381) | 38 (965) | 125 (57) |
| | | | 21 (533) | 44 (1118) | 140 (64) |
| 225 | ED2, ED4, ED6, HED4, HED6 | | 9 (229) | 32 (813) | 110 (50) |
| | | | 15 (381) | 38 (965) | 125 (57) |
| | | | 21 (533) | 44 (1118) | 140 (64) |
| 250 | QJ2 | | 9 (229) | 32 (813) | 110 (50) |
| | QJH2 | | 15 (381) | 38 (965) | 125 (57) |
| | QJ2-H | | 21 (533) | 44 (1118) | 140 (64) |
| 250 | FXD6 | 9 (229) | 32 (813) | 115 (52) | |
| | FD6 | 15 (381) | 38 (965) | 130 (59) | |
| | HFD6, HFXD6 | 21 (533) | 44 (1118) | 145 (66) | |
| ≤ 250 | MLO | 9 (229) | 32 (813) | 115 (52) | |
| | | 15 (381) | 38 (365) | 125 (57) | |
| | | 21 (533) | 44 (1118) | 135 (61) | |
| 400 | JD6, JXD6 | 18 30 42 | 9 (229) | 56 (1422) | 172 (78) |
| | HJD6 | | 15 (381) | 62 (1575) | 190 (86) |
| | HJXD6 | | 21 (533) | 68 (1727) | 208 (95) |
| | | | 9 (229) | 56 (1422) | 115 (52) |
| | MLO | | 15 (381) | 62 (1575) | 130 (59) |
| | | | 21 (533) | 68 (1722) | 145 (66) |

Note: Main breakers use breaker connectors. For sizes, see breaker connector chart. 400 amp main breaker panel has wire bending space for 600 kcmil cables as standard. Use 750 Kcmil lug if 600 Kcmil cable is to be used.


Table P1-4 – Main Breaker Selection

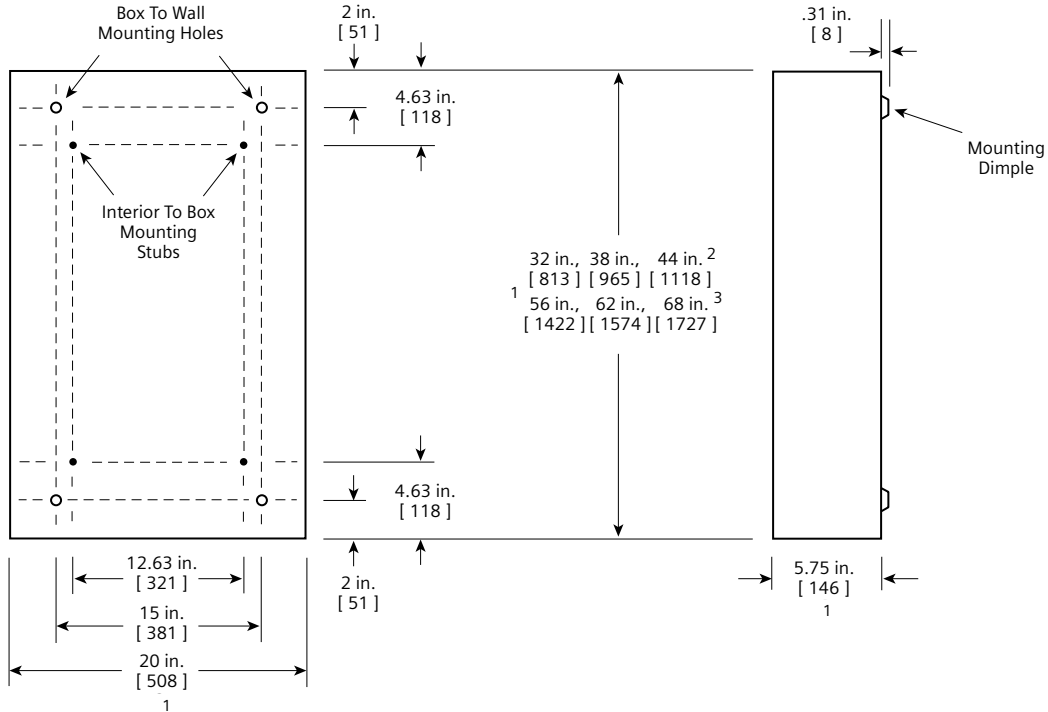
| Ampere Rating | Breaker Type | Max. IR (kA) at | | Additional Trip Values |
|---------------|--------------|-----------------|-------------|---|
| | | 240V AC | 480/277V AC | |
| 100 | BL (STD) | 10 | — | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| | BLH | 22 | — | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| | HBL | 65 | — | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| | BQD | 65 | 14 | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| 125 | NGB (STD) | 100 | 25 | 50, 60, 70, 80, 90, 100, 110, 125 |
| | ED4 (STD) | 65 | 25 | 50, 60, 70, 80, 90, 100, 110, 125 |
| | HED4 | 100 | 42 | 50, 60, 70, 80, 90, 100, 110, 125 |
| 225 | QJ2 (STD) | 10 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| | QJH2 | 22 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| | QJ2-H | 42 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| | HQJ2H | 100 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| 250 | FXD6 (STD) | 65 | 35 | 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250 |
| | FD6 | 65 | 35 | 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250 |
| | HFD6 | 100 | 65 | 70, 80, 90, 100, 150, 175, 200, 225, 250 |
| | HFXD6 | 100 | 65 | 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250 |
| 400 | JXD6 (STD) | 65 | 35 | 200, 225, 250, 300, 350, 400 |
| | JD6 | 65 | 35 | 200, 225, 250, 300, 350, 400 |
| | HJD6 | 100 | 65 | 200, 225, 250, 300, 350, 400 |
| | HJXD6 | 100 | 65 | 200, 225, 250, 300, 350, 400 |

Dimensions

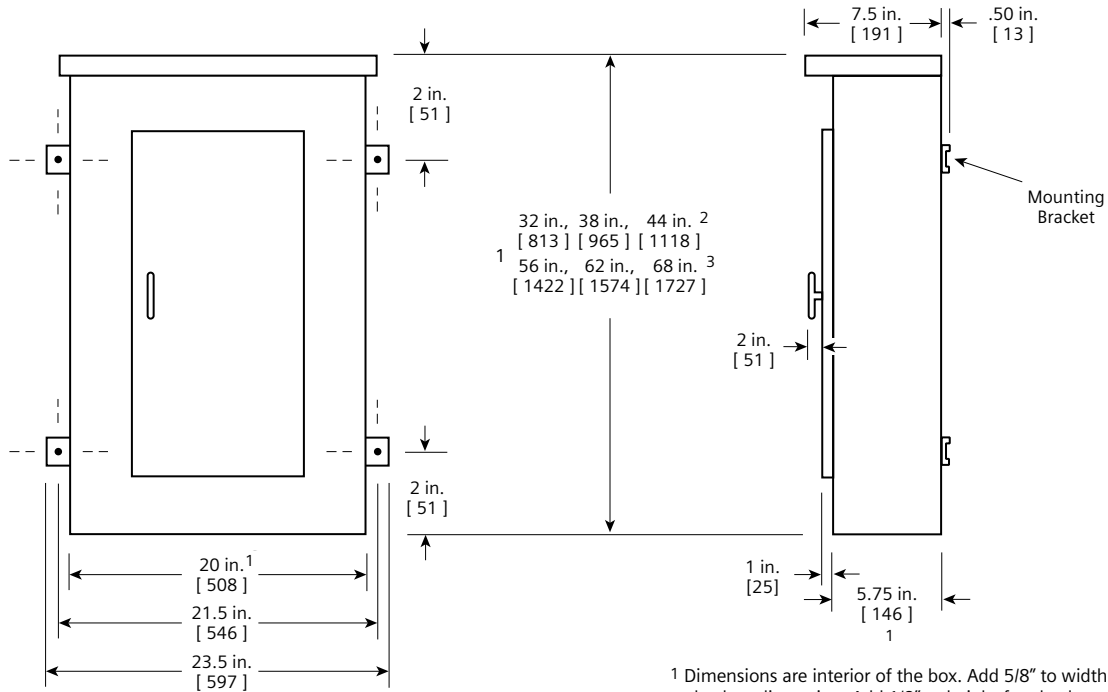
Type P1 Panelboards

Type 1 Box

Box is symmetrical



Type 3R and 3R/12 Box



¹ Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.

² 250 Amp panel.

³ 400 Amp panel.

Dimensions shown in inches and millimeters [].

CASE STUDY

50KW SYSTEM ON RESIDENTIAL BUILDING

BUILDING TYPE:

Residential building with 180 panels of 350W (total 63 kW DC)

SYSTEM SIZE:

3 x 15kW Fronius 15.0-3 208V

SYSTEM LAYOUT:

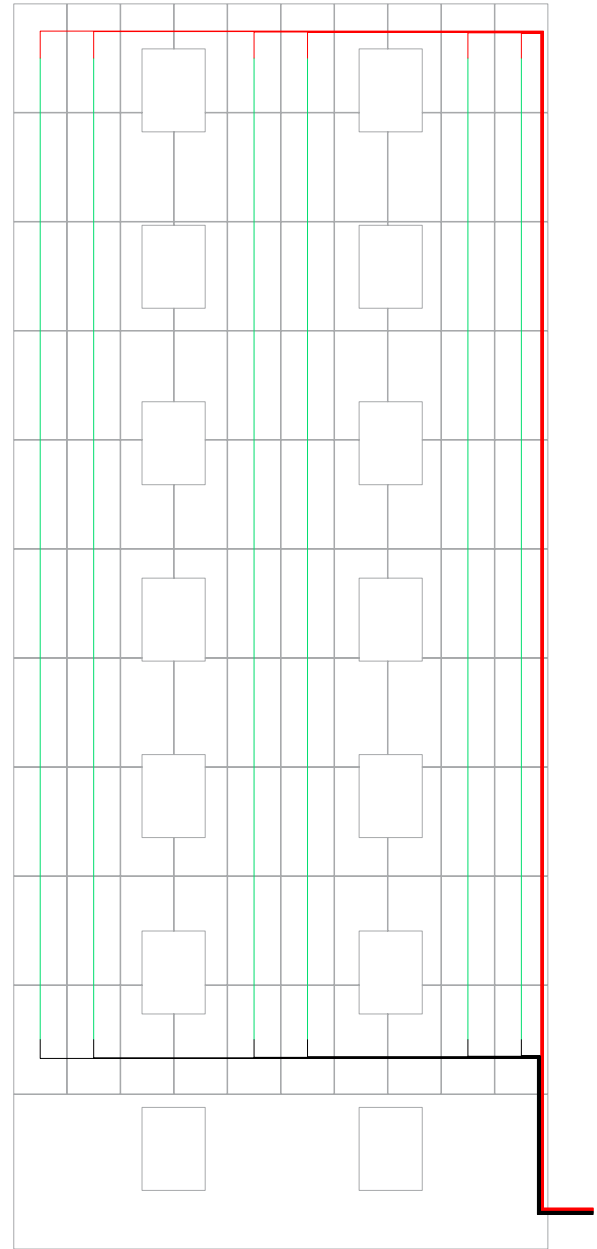
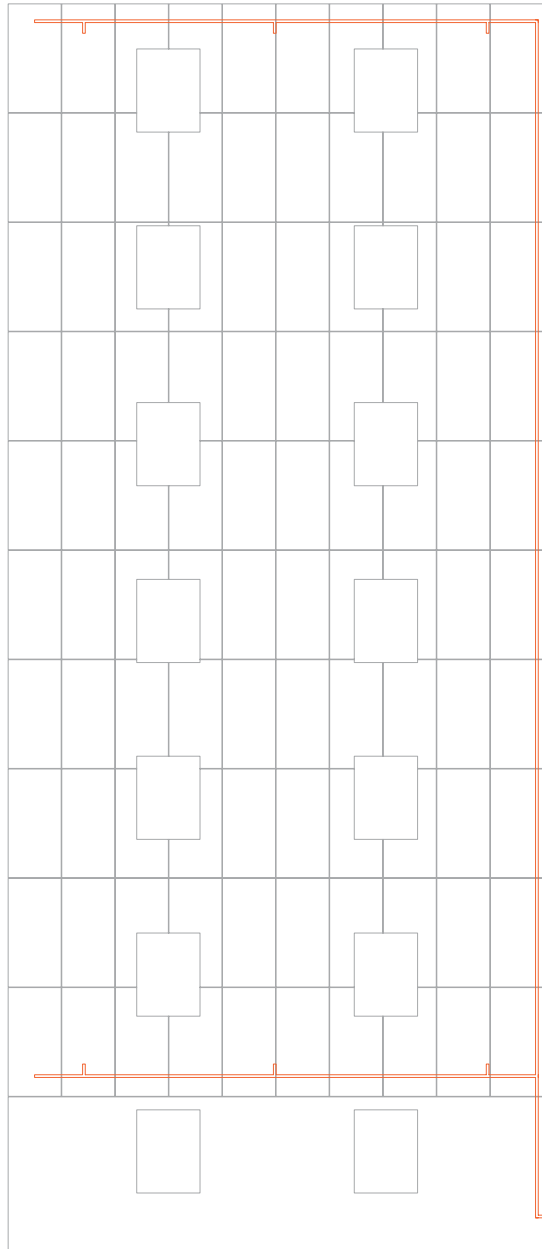
18 strings of 10 panels with one building penetration holes (Conduit size 3")

PROJECT SOLAR EQUIPMENT:

One AC Panelboard 200A 240V, two 200A 240V disconnect switches (One could be replaced with breaker inside the main building switchboard if available)

50kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING BASEMENT

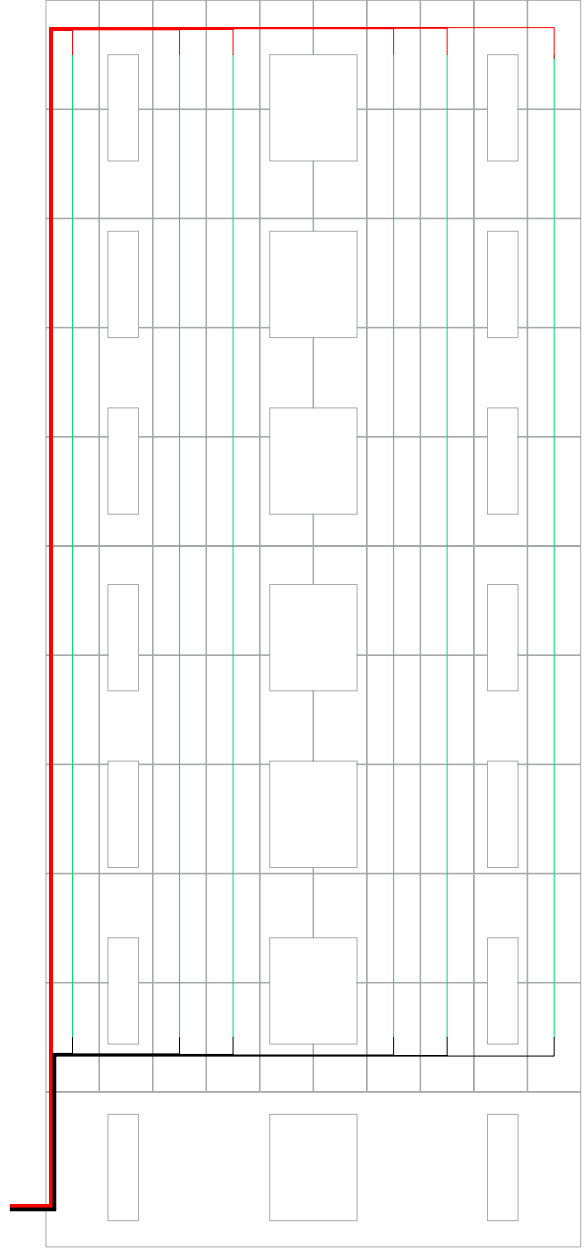
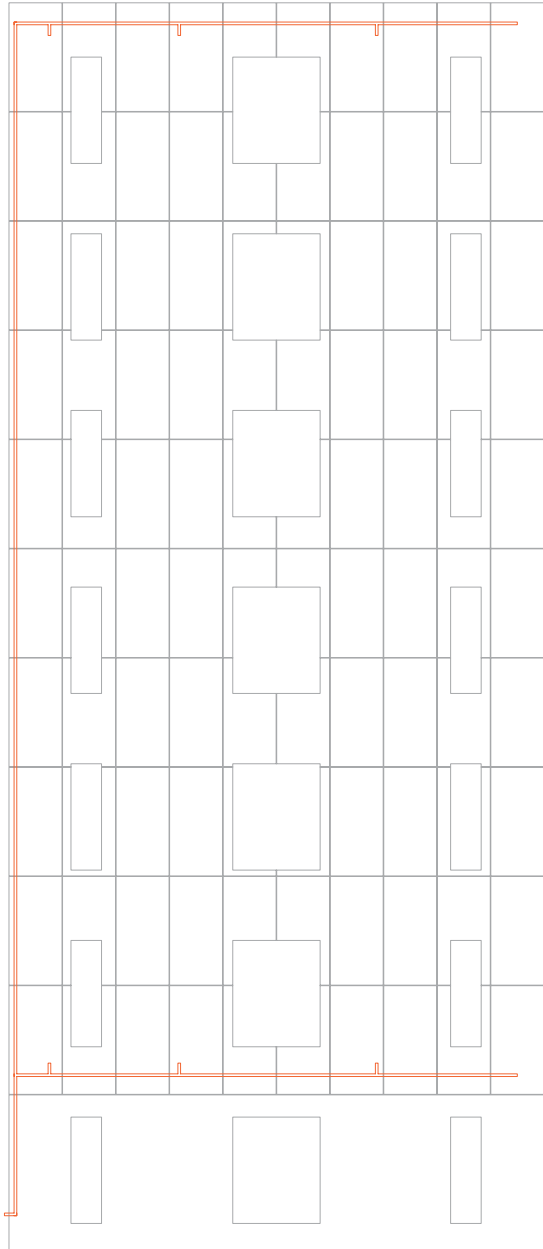
EAST ELEVATION



- LINE COLOUR REFERENCE
- Building & solar panels layout
 - Conduit layout
 - Electrical strings
 - Home run wiring

50kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING BASEMENT

WEST ELEVATION

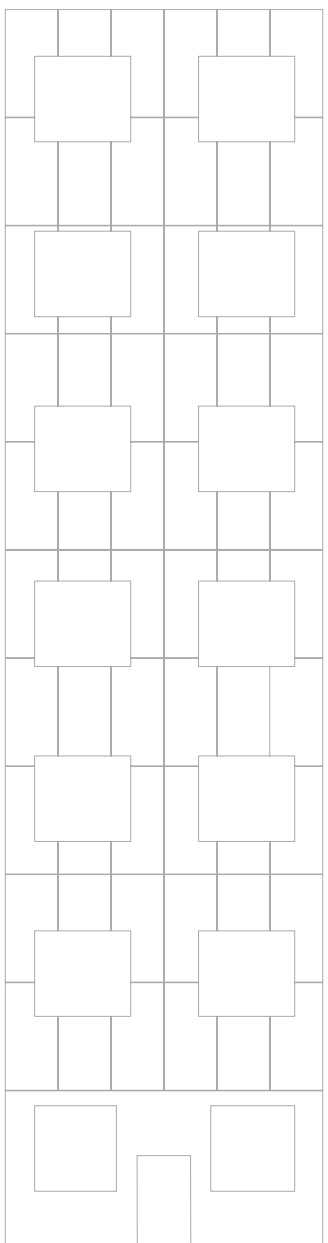
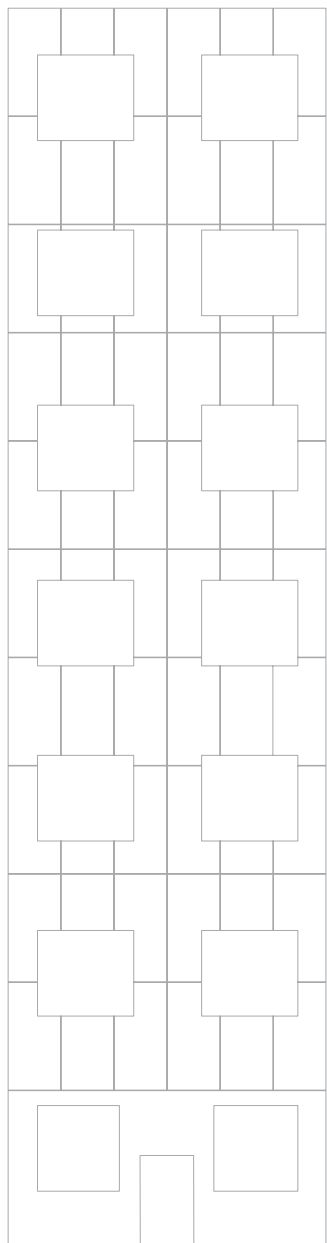
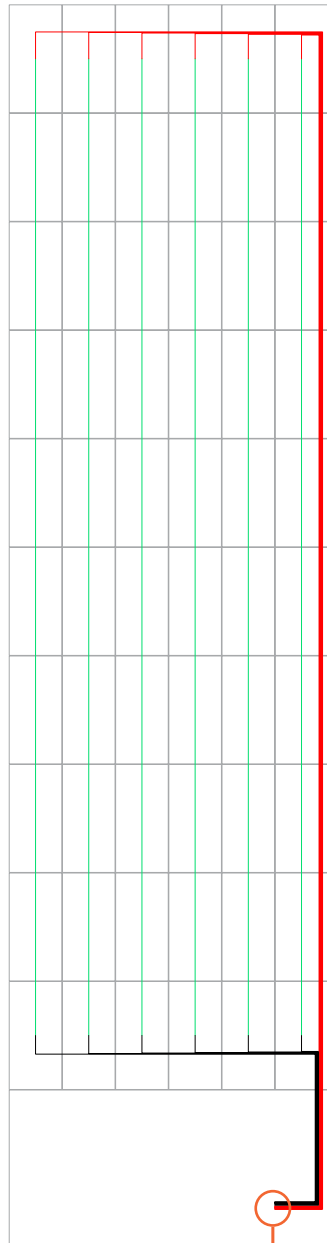


- LINE COLOUR REFERENCE
- Building & solar panels layout
 - Conduit layout
 - Electrical strings
 - Home run wiring

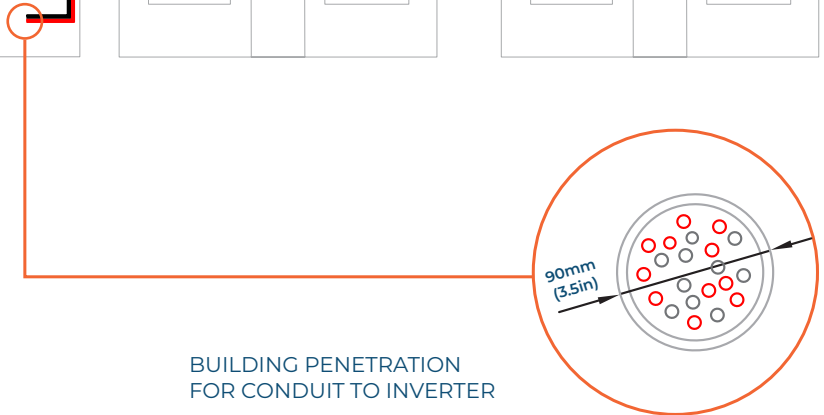
50kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING BASEMENT

NORTH ELEVATION

SOUTH ELEVATION

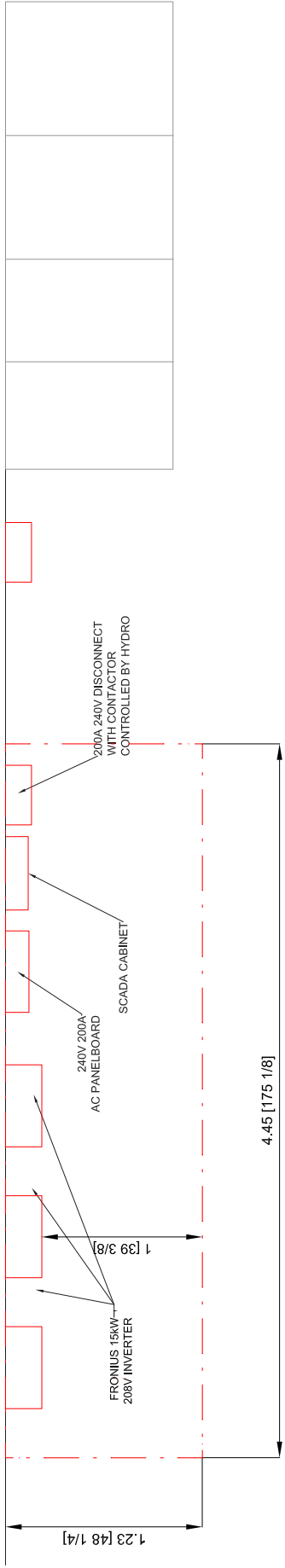


- LINE COLOUR REFERENCE
- Building & solar panels layout
 - Conduit layout
 - Electrical strings
 - Home run wiring



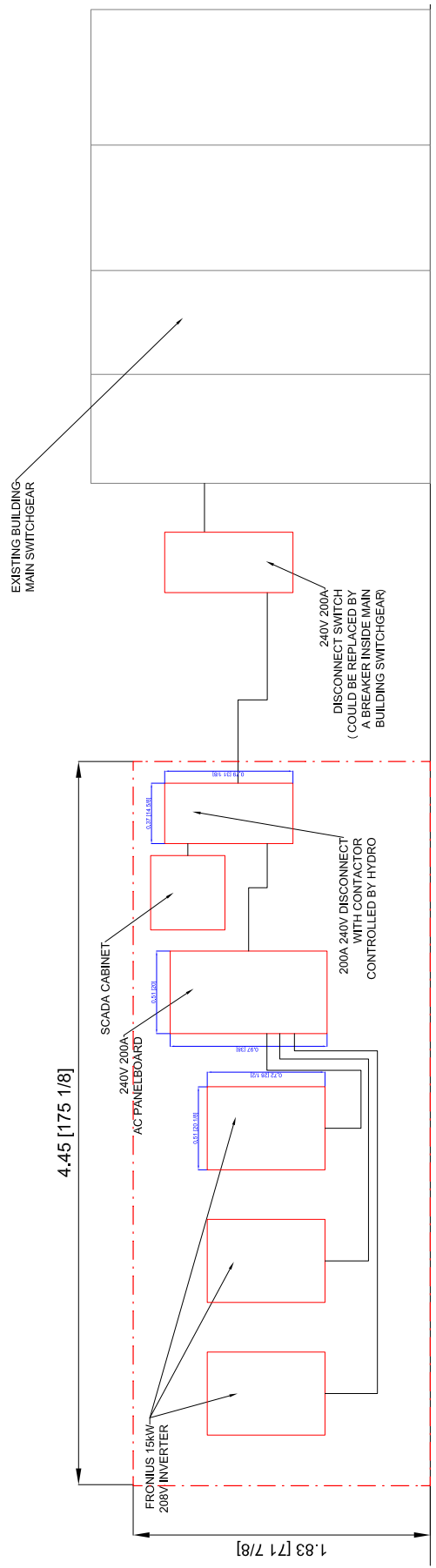
50kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING BASEMENT

TOP VIEW



Note: Working area is 1m (39.37in) in front of solar equipments as per electrical code.

FRONT VIEW





SHIFTING THE LIMITS

FRONIUS SYMO



/ Field serviceable



/ SnapINverter mounting system



/ Wireless monitoring



/ Design flexibility



/ Arc Fault Circuit Interruption



Boasting power categories from 10 to 24 kW, the transformerless Fronius Symo is the ideal compact three-phase inverter for commercial applications. Its dual maximum power point tracking, high maximum system voltage, wide input voltage range and unrestricted use indoors and out, ensures maximum flexibility in PV system design. As a member of the new SnapINverter family, the Fronius Symo features the SnapINverter mounting system, allowing for secure and convenient installation and field servicing.

Industry-leading features now come standard with the Fronius Symo, including: arc fault protection, integrated wireless monitoring, and SunSpec Modbus interfaces for seamless monitoring and datalogging via Fronius' online and mobile platform, Fronius Solar.web. This makes the Fronius Symo one of the most communicative, efficient and streamlined inverters on the market.

TECHNICAL DATA FRONIUS SYMO, ALL SIZES

| GENERAL DATA | STANDARD WITH ALL FRONIUS SYMO MODELS |
|---|---|
| Dimensions (width x height x depth) | 20.1 x 28.5 x 8.9 in. / 51.1 x 72.4 x 22.6 cm |
| Degree of protection | NEMA 4X |
| Night time consumption | < 1 W |
| Inverter topology | Transformerless |
| Cooling | Variable speed fan |
| Installation | Indoor and outdoor installation |
| Ambient operating temperature range | -40 F to 140 F (-40 to 60 C) |
| Permitted humidity | 0 - 100 % (non-condensing) |
| DC connection terminals | 6 x DC+ and 6 x DC- screw terminals for copper (solid / stranded / fine stranded) or aluminum (solid / stranded) |
| AC connection terminals | Screw terminals 14-6 AWG |
| Certificates and compliance with standards (Except Symo 15.0 208 V) | UL 1741-2010, UL1998 (for functions: AFCI and isolation monitoring), IEEE 1547-2003, IEEE 1547.1-2008, ANSI/IEEE C62.41, FCC Part 15 A & B, NEC Article 690, C22. 2 No. 107.1-01 (September 2001), UL1699B Issue 2 -2013, CSA TIL M-07 Issue 1 -2013 |
| Certificates and compliance with standards (Symo 15.0 208 V) | UL 1741-2015, UL1998 (for functions: AFCI, RCMU and isolation monitoring), IEEE 1547-2003, IEEE 1547.1-2003, ANSI/IEEE C62.41, FCC Part 15 A & B, NEC 2014 Article 690, C22. 2 No. 107.1-01 (September 2001), UL1699B Issue 2 -2013, CSA TIL M-07 Issue 1 -2013 |

| PROTECTIVE DEVICES | STANDARD WITH ALL FRONIUS SYMO MODELS |
|--|---------------------------------------|
| AFCI & 2014 NEC Compliant | Yes |
| DC disconnect | Yes |
| DC reverse polarity protection | Yes |
| Ground Fault Protection with Isolation Monitor Interrupter | Yes |

| INTERFACES | AVAILABILITY | AVAILABLE WITH ALL FRONIUS SYMO MODELS |
|---|--------------|---|
| USB (A socket) | Standard | Datalogging and inverter update via USB |
| 2 x RS422 (RJ45 socket) | Standard | Fronius Solar Net, interface protocol |
| Wi-Fi/Ethernet/Serial/ Datalogger and webserver | Optional | Wireless standard 802.11 b/g/n / Fronius Solar.web, SunSpec Modbus TCP, JSON / SunSpec Modbus RTU |
| 6 inputs and 4 digital I/Os | Optional | Load management; signaling, multipurpose I/O |

TECHNICAL DATA FRONIUS SYMO (10.0-3 208/240, 12.0-3 208/240, 10.0-3 480, 12.5-3 480, 15.0-3 208)

| GENERAL DATA | | 10.0-3 208/240 | 12.0-3 208/240 | 10.0-3 480 | 12.5-3 480 | 15.0-3 208 |
|--------------|--|---------------------|----------------|---------------------|------------|---------------------|
| Weight | | 91.9 lbs. / 41.7 kg | | 76.7 lbs. / 34.8 kg | | 78.3 lbs. / 35.5 kg |

| INPUT DATA | | 10.0-3 208/240 | 12.0-3 208/240 | 10.0-3 480 | 12.5-3 480 | 15.0-3 208 |
|---|--|---|----------------|---------------|-------------|-----------------------|
| Max. permitted PV power | | 15.00 kW | 18.00 kW | 15.00 kW | 18.75 kW | 19.5 kW |
| Max. usable input current (MPPT 1/MPPT 2) | | 25.0 A / 16.5 A | | | 50.0 A | |
| Max. usable input current total (MPPT 1 + MPPT 2) | | 41.5 A | | | | 50.0 A |
| Max. admissible input current (MPPT 1/MPPT 2) | | 37.5 A / 24.8 A | | | 75.0 A | |
| Max. admissible input current total (MPPT 1 + MPPT 2) | | 62.2 A | 62.2 A | 62.2 A | 62.2 A | 75.0 A (1 MPPT) |
| Integrated DC string fuse holders <i>Must be specified when ordering</i> | | None | None | None | None | Integrated: 6- and 6+ |
| MPP voltage range | | 300 - 500 V | | 300 - 800 V | 350 - 800 V | 325 - 850 V |
| Operating voltage range | | 200 - 600 V | | 200 - 1,000 V | | 325 - 1,000 V |
| Max. input voltage | | 600 V | | | 1,000 V | |
| Nominal input voltage | | 208 V | 350 V | N/A | N/A | 325 V |
| | | 240 V | 370 V | N/A | N/A | N/A |
| | | 480 V | N/A | 675 V | 685 V | N/A |
| Admissible conductor size DC | | AWG 14 - AWG 6 copper direct, AWG 6 aluminium direct, AWG 4 copper or aluminium with input combiner | | | | |
| Number of MPPT | | 2 | | | | 1 |

| OUTPUT DATA | | 10.0-3 208/240 | 12.0-3 208/240 | 10.0-3 480 | 12.5-3 480 | 15.0-3 208 |
|--------------------------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Max. output power | | 208 V | 9,995 VA | 11,995 VA | N/A | N/A |
| | | 240 V | 9,995 VA | 11,995 VA | N/A | N/A |
| | | 480 V | N/A | N/A | 9,995 VA | 12,495 VA |
| Max. output fault current / Duration | | 43.1 A RMS / 158.4 ms | 43.1 A RMS / 158.4 ms | 43.1 A RMS / 158.4 ms | 43.1 A RMS / 158.4 ms | 67.7 A RMS / 153.0 ms |
| Max. continuous output current | | 208 V | 27.7 A | 33.3 A | N/A | N/A |
| | | 240 V | 24.0 A | 28.9 A | N/A | N/A |
| | | 480 V | N/A | N/A | 12.0 A | 15.0 A |
| Recommended OCPD/AC breaker size | | 208 V | 35 A | 45 A | N/A | N/A |
| | | 240 V | 30 A | 40 A | N/A | N/A |
| | | 480 V | N/A | N/A | 15 A | 20 A |
| Max. efficiency | | 97.0 % | | 97.0 % | 98.1 % | 98.1 % |
| CEC efficiency | | 208 V | 96.5 % | 96.5 % | N/A | N/A |
| | | 240 V | 96.5 % | 96.5 % | N/A | N/A |
| | | 480 V | N/A | N/A | 96.5 % | 97.0 % |
| Admissible conductor size AC | | AWG 14 - AWG 6 | | | | |
| Grid connection | | 208 / 240 V | 208 / 240 V | 480 V Delta +N** | | 208 V |
| Frequency | | 60 Hz | | | | |
| Total harmonic distortion | | < 1.75 % | | | | < 3.5% |
| Power factor | | 0 - 1 ind./cap. | | | | |

**+N for sensing purposes - no current carrying conductor.

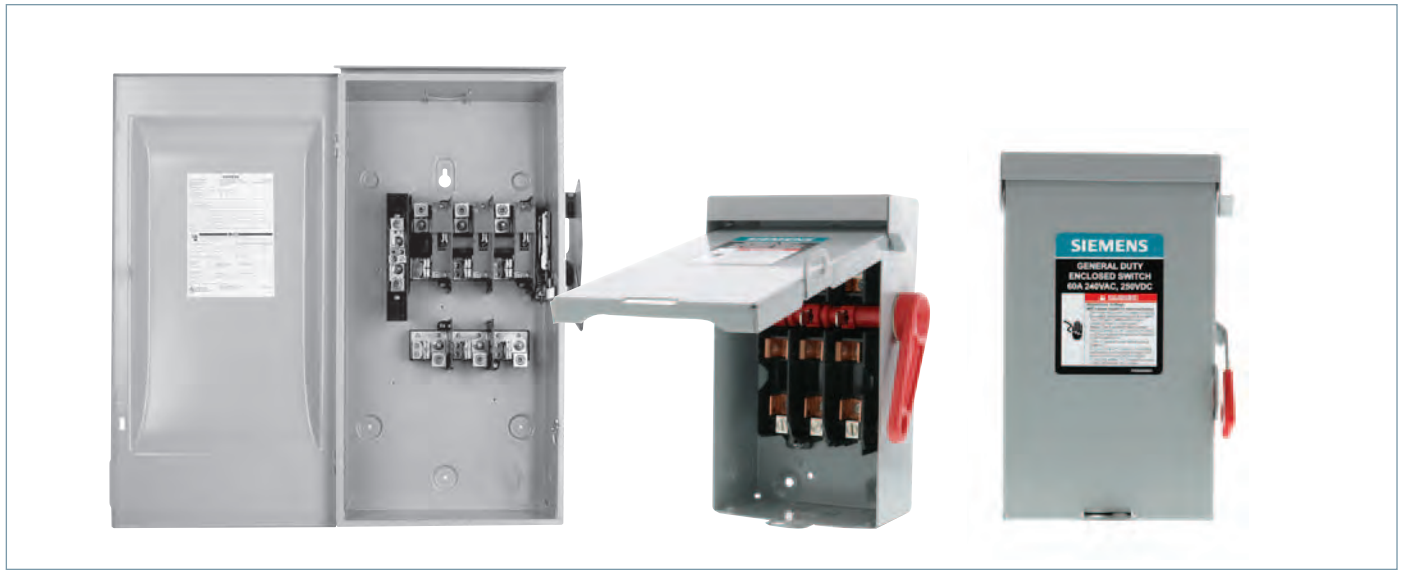
TECHNICAL DATA FRONIUS SYMO (15.0-3 480, 17.5-3 480, 20.0-3 480, 22.7-3 480, 24.0-3 480)

| GENERAL DATA | | 15.0-3 480 | 17.5-3 480 | 20.0-3 480 | 22.7-3 480 | 24.0-3 480 | |
|---|--|---|---------------------|-----------------------|---------------------|-----------------------|--|
| Weight | | 95.7 lbs. / 43.4 kg | | | | | |
| INPUT DATA | | 15.0-3 480 | 17.5-3 480 | 20.0-3 480 | 22.7-3 480 | 24.0-3 480 | |
| Max. permitted PV power | | 22.50 kW | 26.25 kW | 30.00 kW | 34.09 kW | 36.00 kW | |
| Max. usable input current (MPPT 1/MPPT 2) | | 33.0 A / 25.0 A | | | | | |
| Max. usable input current total (MPPT 1 + MPPT 2) | | 51 A | | | | | |
| Max. admissible input current (MPPT 1/MPPT 2) | | 49.5 A / 37.5 A | | | | | |
| Max. admissible input current total (MPPT 1 + MPPT 2) | | 76.5 A | 76.5 A | 76.5 A | 76.5 A | 76.5 A | |
| Integrated DC string fuse holders <i>Must be specified when ordering</i> | | Optional: 6- and 6+ | Optional: 6- and 6+ | Optional: 6- and 6+ | Optional: 6- and 6+ | Optional: 6- and 6+ | |
| MPP voltage range | | 350 - 800 V | 400 - 800 V | 450 - 800 V | 500 - 800 V | 500 - 800 V | |
| Operating voltage range | | 200 - 1,000 V | | | | | |
| Max. input voltage | | 1,000 V | | | | | |
| Nominal input voltage | | 208 V | N/A | N/A | N/A | N/A | |
| | | 240 V | N/A | N/A | N/A | N/A | |
| | | 480 V | 685 V | 695 V | 710 V | 720 V | |
| Admissible conductor size DC | | AWG 14 - AWG 6 copper direct, AWG 6 aluminium direct, AWG 4 copper or aluminium with input combiner | | | | | |
| Number of MPPT | | 2 | | | | | |
| OUTPUT DATA | | 15.0-3 480 | 17.5-3 480 | 20.0-3 480 | 22.7-3 480 | 24.0-3 480 | |
| Max. output power | | 208 V | N/A | N/A | N/A | N/A | |
| | | 240 V | N/A | N/A | N/A | N/A | |
| | | 480 V | 14,995 VA | 17,495 VA | 19,995 VA | 23,995 VA | |
| Max. output fault current / Duration | | 30.9 A RMS / 150.4 ms | | 30.9 A RMS / 150.4 ms | | 30.9 A RMS / 150.4 ms | |
| Max. continuous output current | | 208 V | N/A | N/A | N/A | N/A | |
| | | 240 V | N/A | N/A | N/A | N/A | |
| | | 480 V | 18.0 A | 21.0 A | 24.0 A | 28.9 A | |
| Recommended OCPD/AC breaker size | | 208 V | N/A | N/A | N/A | N/A | |
| | | 240 V | N/A | N/A | N/A | N/A | |
| | | 480 V | 25 A | 30 A | 30 A | 40 A | |
| Max. efficiency | | 98.0 % | | 98.0 % | | | |
| CEC efficiency | | 208 V | N/A | N/A | N/A | N/A | |
| | | 240 V | N/A | N/A | N/A | N/A | |
| | | 480 V | 97.0 % | 97.5 % | 97.5 % | 97.5 % | |
| Admissible conductor size AC | | AWG 14 - AWG 6 | | | | | |
| Grid connection | | 480 V Delta +N** | | | | | |
| Frequency | | 60 Hz | | | | | |
| Total harmonic distortion | | < 1.75 % | | | | | |
| Power factor | | 0 - 1 ind./cap. | | | | | |

**+N for sensing purposes - no current carrying conductor.

General Duty Safety Switches

Selection



4 SAFETY SWITCHES

| System | Ampere Rating | Indoor — Type 1 | | Outdoor — Type 3R | | Horsepower Rating ^① | | | | | | |
|--------|---------------|-----------------|--------------------------|-------------------|--------------------------|--------------------------------|-----------------|-----------------|------|------|------|------|
| | | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 240V AC | | 250 Volt DC | | | | |
| | | | | | | 1-Phase, 2-Wire | 2-Phase, 4-Wire | 3-Phase, 3-Wire | Std. | Max. | Std. | Max. |

240 Volt Fusible^①

2-Pole, 2-Fuse, and Solid Neutral^{②③④}

240 Volt AC/250 Volt DC

| | | | | | | | | | | | | |
|--|-----|---------|-----------------|-----------------------|-----------------|----|----|---|---|----|----|----|
| | 30 | GF221NA | 30 ^⑦ | GF221NRA ^⑤ | 30 ^⑦ | 1½ | 3 | — | — | 3 | 7½ | 5 |
| | 60 | GF222NA | 20 ^⑥ | GF222NRA ^⑤ | 20 ^⑥ | 3 | 10 | — | — | 7½ | 15 | 10 |
| | 100 | GF223N | 23 | GF223NR | 23 | 7½ | 15 | — | — | 15 | 30 | 20 |
| | 200 | GF224N | 47 | GF224NR | 48 | 15 | — | — | — | 25 | 60 | 40 |

3-Pole, 3-Fuse, and Solid Neutral^④

240 Volt AC/250 Volt DC

| | | | | | | | | | | | | |
|--|-----|---------|-----------------|-----------------------|-----------------|----|----|---|---|----|-----|----|
| | 30 | GF321NA | 30 ^⑦ | GF321NRA ^⑤ | 30 ^⑦ | 1½ | 3 | — | — | 3 | 7½ | 5 |
| | 60 | GF322NA | 20 ^⑥ | GF322NRA ^⑤ | 20 ^⑥ | 3 | 10 | — | — | 7½ | 15 | 10 |
| | 100 | GF323N | 25 | GF323NR | 25 | 7½ | 15 | — | — | 15 | 30 | 20 |
| | 200 | GF324N | 49 | GF324NR | 50 | 15 | — | — | — | 25 | 60 | 40 |
| | 400 | GF325NA | 94.6 | GF325NRA | 94.6 | 15 | — | — | — | 50 | 125 | 50 |
| | 600 | GF326NA | 95.6 | GF326NRA | 95.6 | 15 | — | — | — | 75 | 200 | — |

240 Volt Non-Fusible^{③④⑪}

2-Pole or 3-Pole

240 Volt AC/250 Volt DC

| | | | | | | | | | | | | |
|--|-----|-----------------------|-----------------|----------------------------|-----------------|---|----|---|---|-----|---|----|
| | 30 | GNF221A | 20 ^⑦ | GNF221RA ^⑤ | 20 ^⑦ | — | 3 | — | — | — | — | 5 |
| | 30 | GNF321A ^⑨ | 20 ^⑦ | GNF321RA ^{⑤⑩} | 20 ^⑦ | — | 3 | — | — | 7½ | — | 5 |
| | 30 | GNF321LA ^⑩ | 30 ^⑦ | GNF321RLA ^{⑤⑩} | 30 ^⑦ | — | 3 | — | — | 7½ | — | 5 |
| | 60 | GNF222A | 30 ^⑦ | GNF222RA ^⑤ | 30 ^⑦ | — | 10 | — | — | 15 | — | 10 |
| | 60 | GNF322A | 30 ^⑦ | GNF322RA ^⑤ | 30 ^⑦ | — | 10 | — | — | 15 | — | 10 |
| | 100 | GNF323 | 23 | GNF323R | 24 | — | 15 | — | — | 30 | — | 20 |
| | 200 | GNF324 | 46 | GNF324R | 47 | — | 15 | — | — | 60 | — | 40 |
| | 400 | GNF325A | 114 | Use 600V Switch — HNF365RA | — | — | 15 | — | — | 125 | — | 50 |
| | 600 | GNF326A | 116 | Use 600V Switch — HNF366RA | — | — | 15 | — | — | 200 | — | — |

① Dual horsepower ratings: Std.- applies when non-time delay fuses are installed. Max.- applies when time-delay fuses are installed.
 ② These switches are UL-listed for application on grounded B-phase systems.
 ③ Suitable for use on 3-phase motor loads.

④ Service entrance labeled.
 ⑤ Has provision for ECHA type hub.
 ⑥ 5 switches per standard package.
 ⑦ 10 switches per standard package.
 ⑧ Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

⑨ Not suitable for service entrance.
 ⑩ Indicates oversized enclosure.
 ⑪ Internal shields for 30A to 200A switches to meet 2020 NEC 230.62 touch safe requirements for service entrance equipment can be purchased separately. See accessory section for catalog numbers.

General and Heavy Duty Safety Switches

Dimensions

Safety Switch Dimensions (Inches)* & Shipping Weights

| Catalog Number | Height | | | Width | | Depth | | Knockout Diagram ^① | Shipping Weight (lbs.) |
|---------------------|--------|-------------|------------------|-------|---------------|-------|---------------|-------------------------------|------------------------|
| | Box A | With Door B | With Rain Shed C | Box D | With Handle E | Box F | With Handle G | | |
| GF221NA | 8.4 | 8.56 | — | 5.08 | 5.44 | 2.93 | 3.96 | S4 | 30(10) |
| GF221NRA | 8.4 | 8.56 | 8.56 | 5.08 | 5.44 | 2.93 | 3.96 | S5 | 30(10) |
| GF222NA | 9.91 | 10.07 | — | 6.06 | 6.42 | 3.21 | 4.24 | S21 | 20(5) |
| GF222NRA | 9.91 | 10.07 | 10.07 | 6.06 | 6.42 | 3.21 | 4.24 | S22 | 20(5) |
| GF223N | 21.95 | 23.15 | — | 9.64 | 11.7 | 5.05 | 8.63 | S10 | 23 |
| GF223NR | 21.95 | — | 23.46 | 9.64 | 11.67 | 5.05 | 8.7 | S11 | 24 |
| GF224N | 29.9 | 31.07 | — | 14.62 | 16.68 | 6.36 | 10.92 | S12 | 47 |
| GF224NR | 29.9 | — | 31.42 | 14.61 | 16.68 | 6.36 | 10.92 | S13 | 48 |
| GF225NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 91.1 |
| GF225NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 91.1 |
| GF226NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 95.6 |
| GF226NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 95.6 |
| GF321NA | 8.4 | 8.56 | — | 5.08 | 5.44 | 2.93 | 3.96 | S4 | 30(10) |
| GF321NRA | 8.4 | 8.56 | 8.56 | 5.08 | 5.44 | 2.93 | 3.96 | S5 | 30(10) |
| GF322NA | 9.91 | 10.07 | — | 6.06 | 6.42 | 3.21 | 4.24 | S21 | 20(5) |
| GF322NRA | 9.91 | 10.07 | 10.07 | 6.06 | 6.42 | 3.21 | 4.24 | S22 | 20(5) |
| GF323N | 21.95 | 23.15 | — | 9.64 | 11.7 | 5.05 | 8.63 | S10 | 25 |
| GF323NR | 21.95 | — | 23.46 | 9.64 | 11.67 | 5.05 | 8.7 | S11 | 25 |
| GF324N | 29.9 | 31.07 | — | 14.62 | 16.68 | 6.36 | 10.92 | S12 | 49 |
| GF324NR | 29.9 | — | 31.42 | 14.61 | 16.68 | 6.36 | 10.92 | S13 | 50 |
| GF325NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 94.6 |
| GF325NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 94.6 |
| GF326NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 99.6 |
| GF326NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 99.6 |
| GF326NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 99.6 |
| GNF221A | 6.18 | 6.35 | — | 4.2 | 4.56 | 2.88 | 3.93 | S4 | 20(10) |
| GNF221RA | 6.18 | 6.35 | 6.35 | 4.2 | 4.56 | 2.88 | 3.93 | S5 | 20(10) |
| GNF321LA | 8.4 | 8.56 | — | 5.08 | 5.43 | 2.93 | 3.95 | S4 | 30(10) |
| GNF321RLA | 8.4 | 8.56 | 8.56 | 5.08 | 5.43 | 2.93 | 3.95 | S5 | 30(10) |
| GNF222A | 8.4 | 8.56 | — | 5.08 | 5.43 | 2.93 | 3.95 | S4 | 30(10) |
| LNF222RA | 8.4 | 8.56 | 8.56 | 5.08 | 5.43 | 2.93 | 3.95 | S20 | 30(10) |
| GNF222RA | 8.4 | 8.56 | 8.56 | 5.08 | 5.43 | 2.93 | 3.95 | S5 | 30(10) |
| GNF321A | 6.18 | 6.35 | — | 4.2 | 4.56 | 2.88 | 3.93 | S4 | 20(10) |
| GNF321RA | 6.18 | 6.35 | 6.35 | 4.2 | 4.56 | 2.88 | 3.93 | S5 | 20(10) |
| GNF322A | 8.4 | 8.56 | — | 5.08 | 5.43 | 2.93 | 3.95 | S4 | 30(10) |
| GNF322RA | 8.4 | 8.56 | 8.56 | 5.08 | 5.43 | 2.93 | 3.95 | S5 | 30(10) |
| GNF323 | 21.95 | 23.15 | — | 9.64 | 11.7 | 5.05 | 8.63 | S10 | 23 |
| GNF323R | 21.95 | — | 23.46 | 9.64 | 11.67 | 5.05 | 8.7 | S11 | 24 |
| GNF324 | 29.9 | 31.07 | — | 14.62 | 16.68 | 6.36 | 10.92 | S12 | 46 |
| GNF324R | 29.9 | — | 31.42 | 14.61 | 16.68 | 6.36 | 10.92 | S13 | 47 |
| GNF325A | 33.47 | 33.96 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 75 |
| GNF326A | 33.47 | 33.96 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 77 |
| HF221J also HF261J | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 13 |
| HF221N also HF261 | 14.26 | 15.45 | — | 6.64 | 9.01 | 5.05 | 10.17 | S6 | 12 |
| HF221NR also HF261R | 14.39 | — | 15.77 | 6.64 | 9.01 | 5.05 | 10.17 | S8 | 13 |
| HF221S also HF261S | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 13 |
| HF222J also HF262J | 16.22 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 19 |
| HF222N also HF262 | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 18 |
| HF222NR also HF262R | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 19 |
| HF222S also HF262S | 16.22 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 19 |
| HF223J also HF263J | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 24 |
| HF223N also HF263 | 21.95 | 23.15 | — | 9.64 | 12.01 | 5.05 | 10.17 | S10 | 23 |
| HF223NR also HF263R | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 24 |

*For inches / millimeters conversion, multiply inches by 25.4.

① Knocks not provided on Type 4 / 4X and 12 or in 800 & 1200A switches.

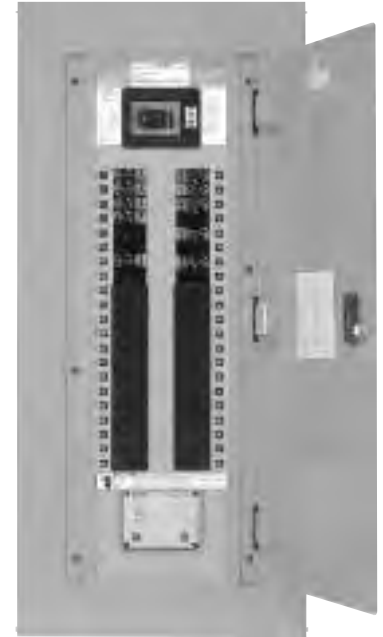
Application

Type P1 Panelboards

Table P1-3 – Main Breaker Panel Size Selector

| Maximum Ampere Rating | Main Breaker Types | Max. No. of Poles | Dimensions in Inches (mm) | | |
|-----------------------|---------------------------------|-------------------|---------------------------|--------------|---------------------|
| | | | Unit Space A | Box Height B | Weight In lbs. (kg) |
| 100 | BL, BLH | 18 30 42 | 9 (229) | 32 (813) | 105 (48) |
| | HBL | | 15 (381) | 38 (965) | 120 (55) |
| | BQD | | 21 (533) | 44 (1118) | 135 (61) |
| 125 | NGB | | 9 (229) | 32 (813) | 110 (50) |
| | | | 15 (381) | 38 (965) | 125 (57) |
| | | | 21 (533) | 44 (1118) | 140 (64) |
| 225 | ED2, ED4, ED6, HED4, HED6 | | 9 (229) | 32 (813) | 110 (50) |
| | | | 15 (381) | 38 (965) | 125 (57) |
| | | | 21 (533) | 44 (1118) | 140 (64) |
| 250 | QJ2 | | 9 (229) | 32 (813) | 110 (50) |
| | QJH2 | | 15 (381) | 38 (965) | 125 (57) |
| | QJ2-H | | 21 (533) | 44 (1118) | 140 (64) |
| 250 | FXD6 | 9 (229) | 32 (813) | 115 (52) | |
| | FD6 | 15 (381) | 38 (965) | 130 (59) | |
| | HFD6, HFXD6 | 21 (533) | 44 (1118) | 145 (66) | |
| ≤ 250 | MLO | 9 (229) | 32 (813) | 115 (52) | |
| | | 15 (381) | 38 (365) | 125 (57) | |
| | | 21 (533) | 44 (1118) | 135 (61) | |
| 400 | JD6, JXD6 | 18 30 42 | 9 (229) | 56 (1422) | 172 (78) |
| | HJD6 | | 15 (381) | 62 (1575) | 190 (86) |
| | HJXD6 | | 21 (533) | 68 (1727) | 208 (95) |
| | | | 9 (229) | 56 (1422) | 115 (52) |
| | MLO | | 15 (381) | 62 (1575) | 130 (59) |
| | | | 21 (533) | 68 (1722) | 145 (66) |

Note: Main breakers use breaker connectors. For sizes, see breaker connector chart. 400 amp main breaker panel has wire bending space for 600 kcmil cables as standard. Use 750 Kcmil lug if 600 Kcmil cable is to be used.


Table P1-4 – Main Breaker Selection

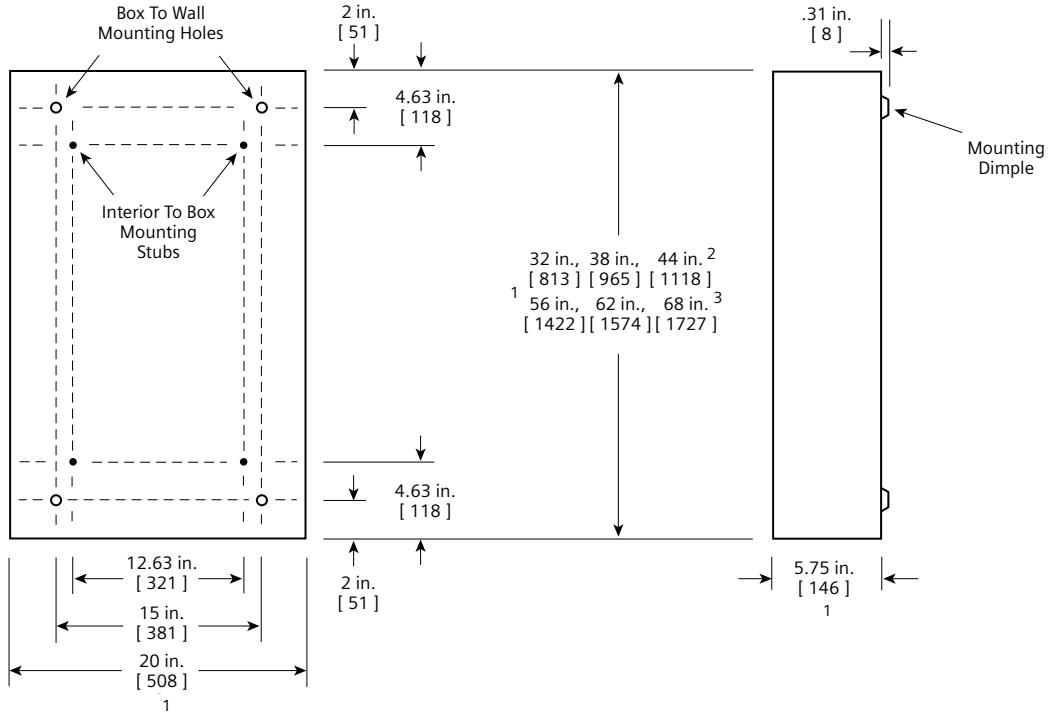
| Ampere Rating | Breaker Type | Max. IR (kA) at | | Additional Trip Values |
|---------------|--------------|-----------------|-------------|---|
| | | 240V AC | 480/277V AC | |
| 100 | BL (STD) | 10 | — | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| | BLH | 22 | — | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| | HBL | 65 | — | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| | BQD | 65 | 14 | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| 125 | NGB (STD) | 100 | 25 | 50, 60, 70, 80, 90, 100, 110, 125 |
| | ED4 (STD) | 65 | 25 | 50, 60, 70, 80, 90, 100, 110, 125 |
| | HED4 | 100 | 42 | 50, 60, 70, 80, 90, 100, 110, 125 |
| 225 | QJ2 (STD) | 10 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| | QJH2 | 22 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| | QJ2-H | 42 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| | HQJ2H | 100 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| 250 | FXD6 (STD) | 65 | 35 | 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250 |
| | FD6 | 65 | 35 | 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250 |
| | HFD6 | 100 | 65 | 70, 80, 90, 100, 150, 175, 200, 225, 250 |
| | HFXD6 | 100 | 65 | 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250 |
| 400 | JXD6 (STD) | 65 | 35 | 200, 225, 250, 300, 350, 400 |
| | JD6 | 65 | 35 | 200, 225, 250, 300, 350, 400 |
| | HJD6 | 100 | 65 | 200, 225, 250, 300, 350, 400 |
| | HJXD6 | 100 | 65 | 200, 225, 250, 300, 350, 400 |

Dimensions

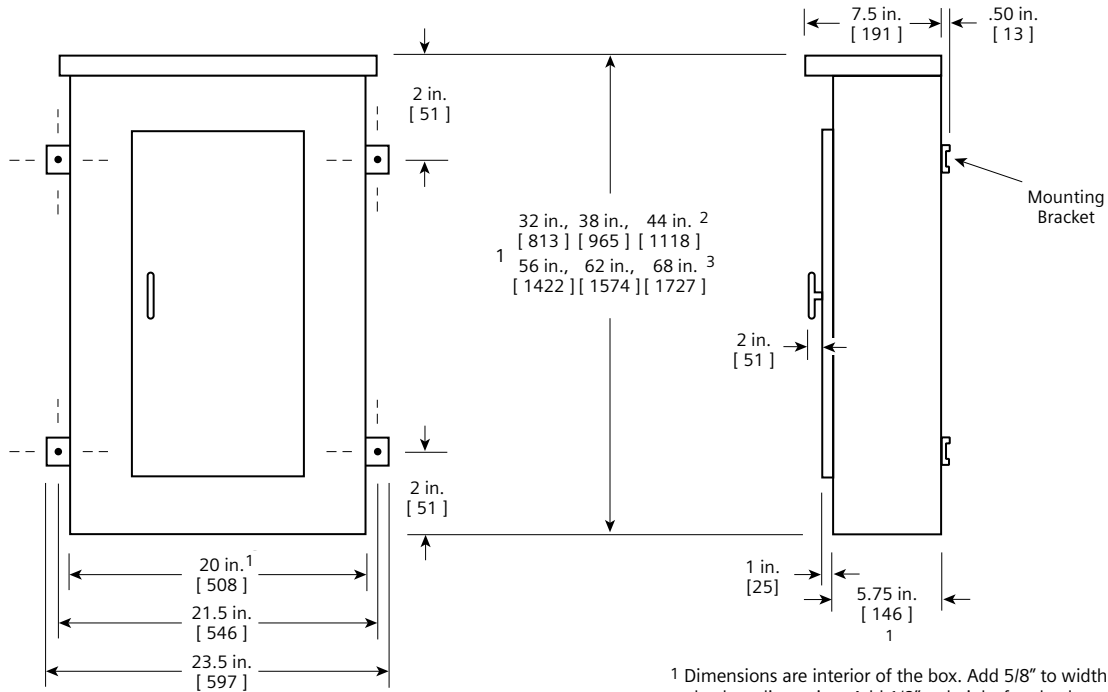
Type P1 Panelboards

Type 1 Box

Box is symmetrical



Type 3R and 3R/12 Box



¹ Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.

² 250 Amp panel.

³ 400 Amp panel.

Dimensions shown in inches and millimeters [].

CASE STUDY

100KW SYSTEM ON MIDRISE INDUSTRIAL BUILDING

BUILDING TYPE:

Industrial building with 480 panels of 300W (total 144 kW DC)

SYSTEM SIZE:

100kW Solaredge inverter SE100KUS

SYSTEM LAYOUT:

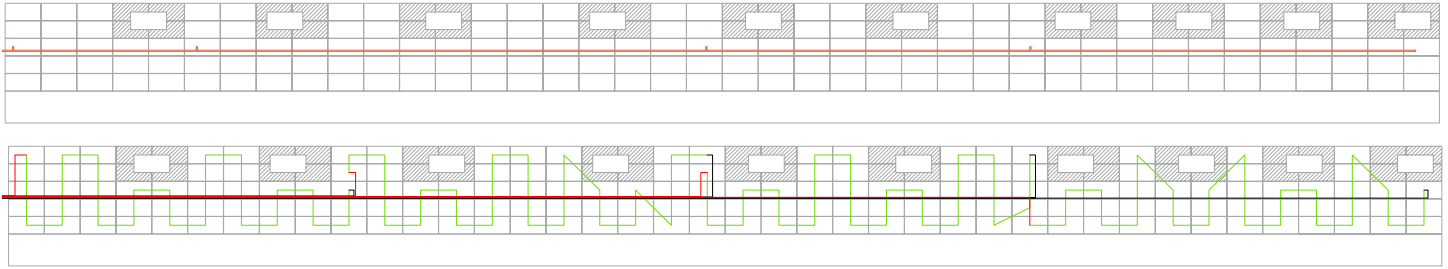
12 strings of 40 panels with one building penetration hole (Conduit size 2 1/2")

PROJECT SOLAR EQUIPMENT:

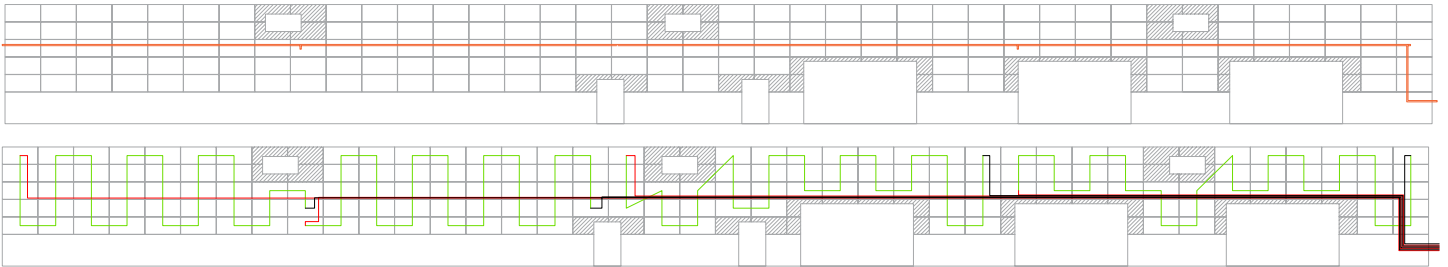
One disconnect switch 200A 600V, One 150kVA transformer 480V/600V, two more disconnect (One could be replaced with breaker inside the main building switchboard if available)

100kW SYSTEM WIRING LAYOUT: HOME RUN TO BUILDING BASEMENT

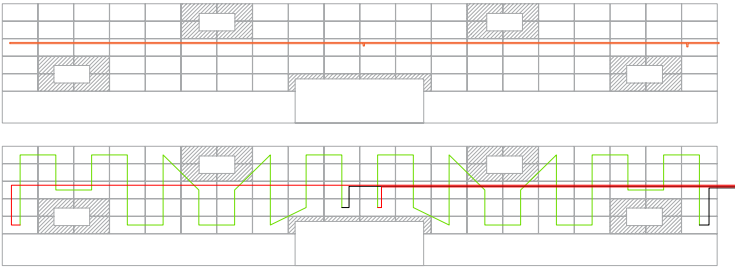
EAST ELEVATION LAYOUT



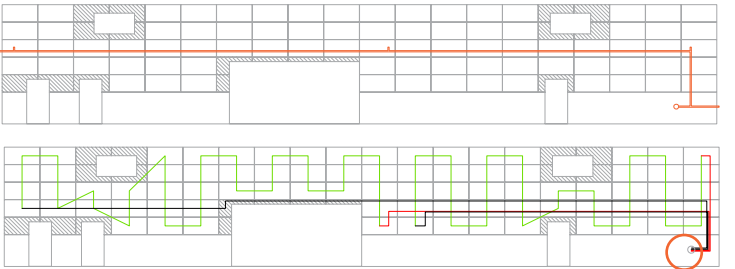
WEST ELEVATION LAYOUT



NORTH ELEVATION LAYOUT



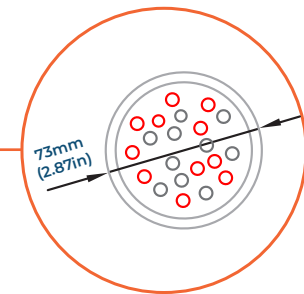
SOUTH ELEVATION LAYOUT



LINE COLOUR REFERENCE

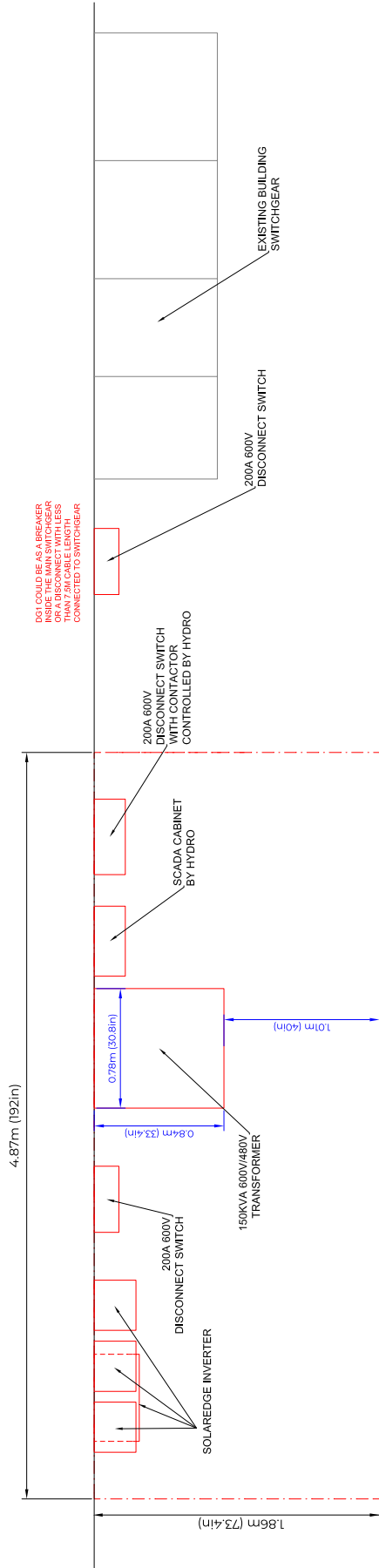
- Building & solar panels layout
- Conduit layout
- Electrical strings
- Home run wiring

BUILDING PENETRATION FOR CONDUIT TO INVERTER

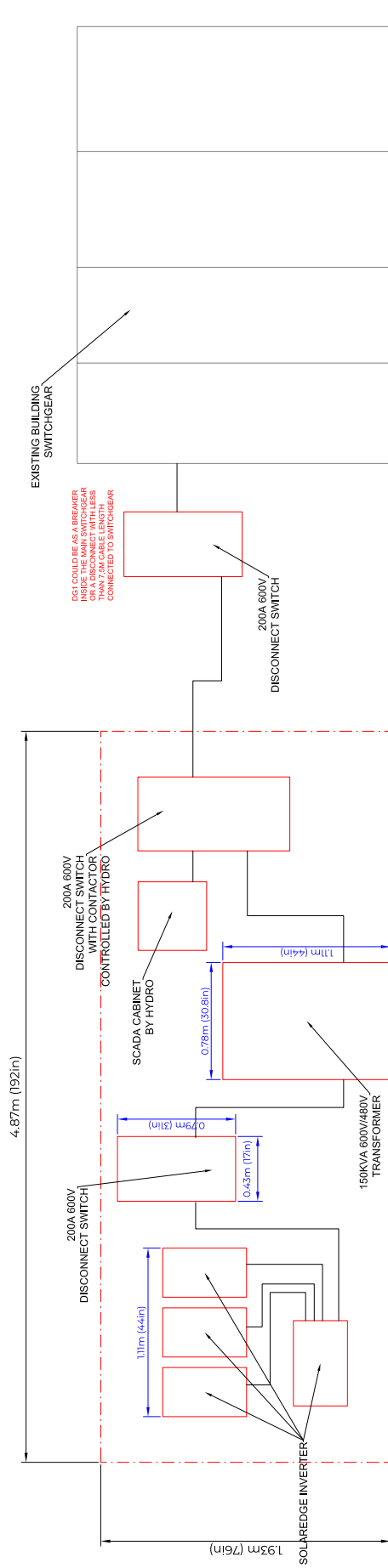


REQUIRED SPACE FOR SOLAR EQUIPMENT: PLACED IN THE BASEMENT

TOP VIEW



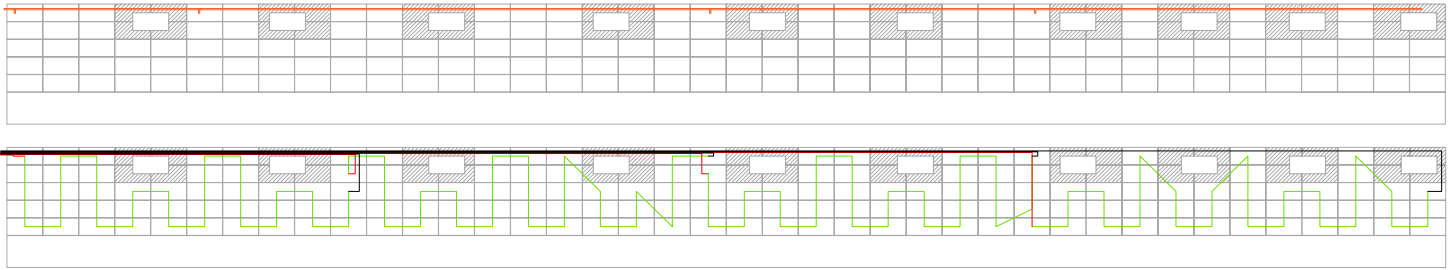
FRONT VIEW



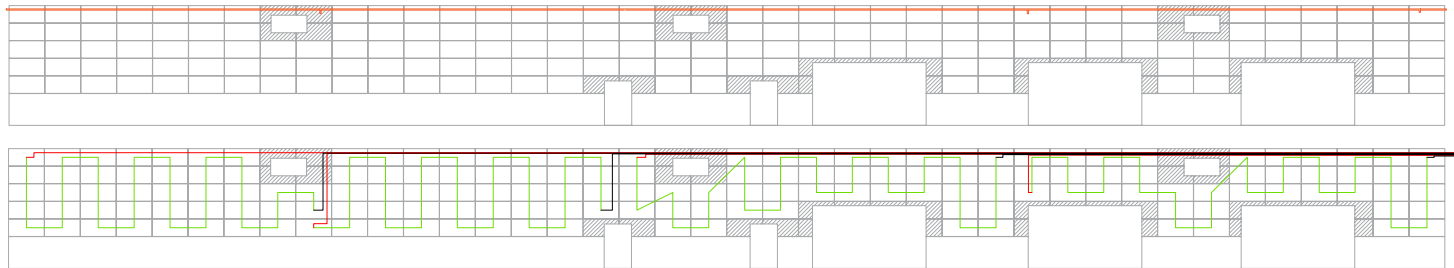
Note: Working area is 1m (39.37in) in front of solar equipments as per electrical code.

100kW SYSTEM WIRING LAYOUT: HOME RUN TO BUILDING ROOFTOP

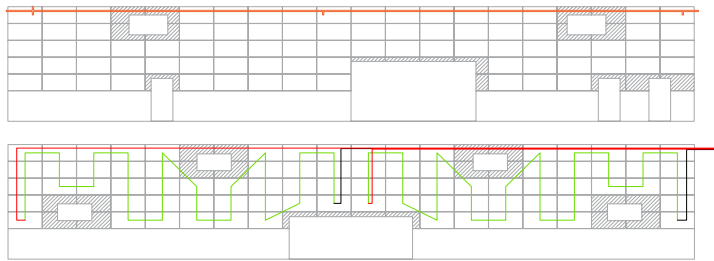
EAST ELEVATION



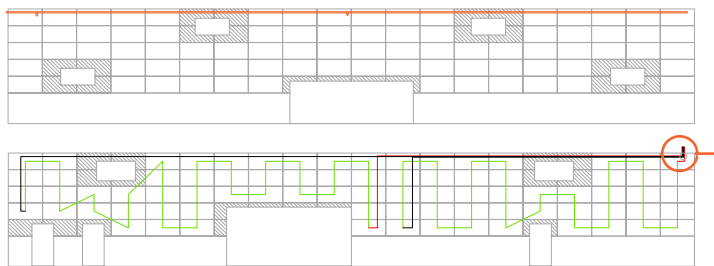
WEST ELEVATION



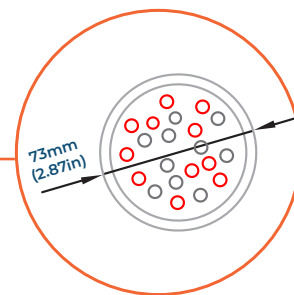
NORTH ELEVATION



SOUTH ELEVATION



BUILDING PENETRATION FOR CONDUIT TO INVERTER

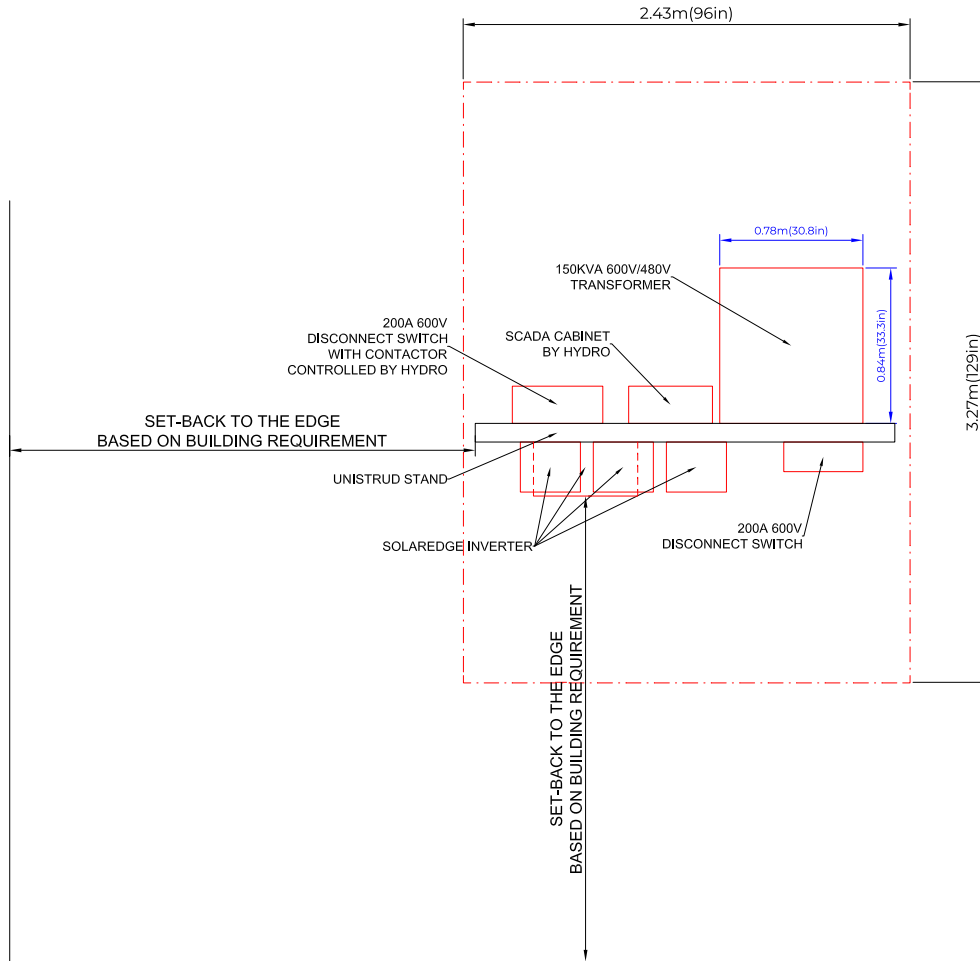


LINE COLOUR REFERENCE

- Building & solar panels layout
- Conduit layout
- Electrical strings
- Home run wiring

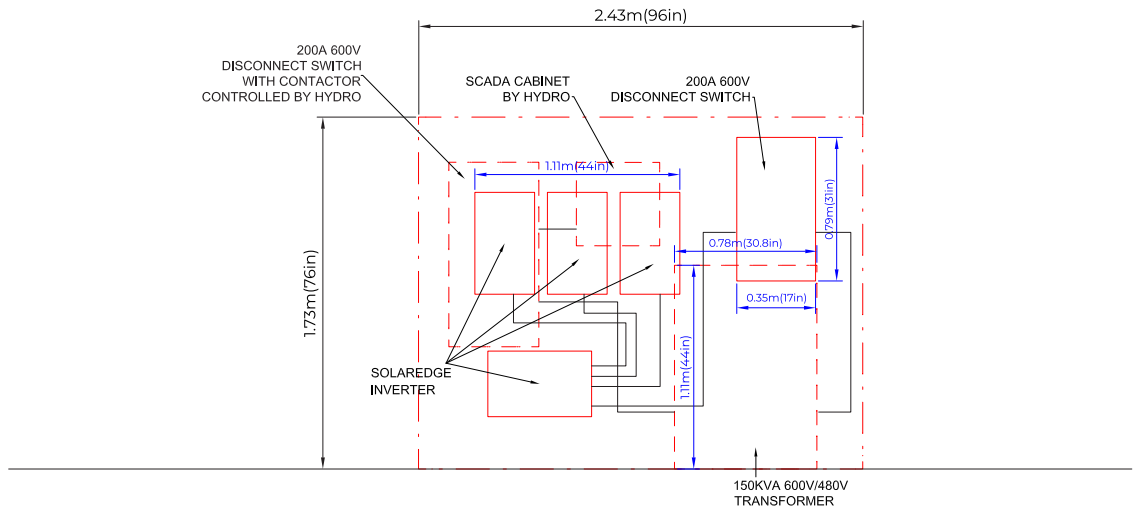
REQUIRED SPACE FOR SOLAR EQUIPMENT: PLACED ON ROOFTOP

TOP VIEW



Note: Working area is 1m (39.37in) in front of solar equipments as per electrical code.

FRONT VIEW



Three Phase Inverter with Synergy Technology

For the 277/480V Grid for North America

SE80KUS / SE100KUS / SE110KUS / SE120KUS



Powered by unique pre-commissioning process for rapid system installation

- Pre-commissioning feature for automated validation of system components and wiring during the site installation process and prior to grid connection
- Easy 2-person installation with lightweight, modular design (each inverter consists of 2 or 3 Synergy units and 1 Synergy Manager)
- Independent operation of each Synergy unit enables higher uptime and easy serviceability
- Built-in thermal sensors detect faulty wiring, ensuring enhanced protection and safety
- Built-in arc fault protection and rapid shutdown
- Built-in PID mitigation for maximized system performance
- Monitored* and field-replaceable surge protection devices, to better withstand surges caused by lightning or other events
- Built-in module-level monitoring with Ethernet or cellular communication for full system visibility

*Applicable only for DC and AC SPDs

/ Three Phase Inverter with Synergy Technology

For the 277/480V Grid for North America

SE80KUS / SE100KUS / SE110KUS / SE120KUS

| MODEL NUMBER | SE80KUS | SE100KUS | SE110KUS | SE120KUS | |
|--|--|----------------|----------------|----------|-------|
| APPLICABLE TO INVERTERS WITH PART NUMBER | SExxK-USx8lxxxx | | | | UNITS |
| OUTPUT | | | | | |
| Rated AC Active Output Power | 80000 | 100000 | 110000 | 120000 | W |
| Maximum AC Apparent Output Power | 80000 | 100000 | 120000 | 120000 | VA |
| AC Output Line Connections | 3W + PE, 4W + PE | | | | |
| Supported Grids | WYE: TN-C, TN-S, TN-C-S, TT, IT; Delta: IT | | | | |
| AC Output Voltage Minimum-Nominal-Maximum ⁽¹⁾ (L-N) | 244 – 277 – 305 | | | | Vac |
| AC Output Voltage Minimum-Nominal-Maximum ⁽¹⁾ (L-L) | 422.5 – 480 – 529 | | | | Vac |
| AC Frequency Min-Nom-Max ⁽¹⁾ | 59.5 – 60 – 60.5 | | | | Hz |
| Maximum Continuous Output Current (per Phase, PF=1) | 96.5 | 120 | 144.3 | | Aac |
| GFDI Threshold | 1 | | | | A |
| Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds | Yes | | | | |
| Total Harmonic Distortion | ≤ 3 | | | | % |
| Power Factor Range | +/-0.2 to 1 | | | | |
| INPUT | | | | | |
| Maximum DC Power (Module STC) Inverter / Synergy Unit | 140000 / 70000 | 175000 / 58300 | 210000 / 70000 | | W |
| Transformer-less, Ungrounded | Yes | | | | |
| Maximum Input Voltage DC+ to DC- | 1000 | | | | Vdc |
| Operating Voltage Range | 850 – 1000 | | | | Vdc |
| Maximum Input Current | 2 x 48.25 | 3 x 40 | 3 x 48.25 | | Adc |
| Reverse-Polarity Protection | Yes | | | | |
| Ground-Fault Isolation Detection | 167kΩ sensitivity per Synergy Unit ⁽²⁾ | | | | |
| CEC Weighted Efficiency | 98.5 | | | | % |
| Nighttime Power Consumption | < 8 | < 12 | | | W |
| ADDITIONAL FEATURES | | | | | |
| Supported Communication Interfaces ⁽³⁾ | 2 x RS485, Ethernet, Wi-Fi (optional), Cellular (optional) | | | | |
| Smart Energy Management | Export Limitation | | | | |
| Inverter Commissioning | With the SetApp mobile application using built-in Wi-Fi access point for local connection | | | | |
| Arc Fault Protection | Built-in, User Configurable (According to UL1699B) | | | | |
| Photovoltaic Rapid Shutdown System | EC 2014, 2017 and 2020, Built-in | | | | |
| PID Rectifier | Nighttime, built-in | | | | |
| RS485 Surge Protection (ports 1+2) | Type II, field replaceable, integrated | | | | |
| AC, DC Surge Protection | Type II, field replaceable, integrated | | | | |
| DC Fuses (Single Pole) | 25A, integrated | | | | |
| DC SAFETY SWITCH | | | | | |
| DC Disconnect | Built-in | | | | |
| STANDARD COMPLIANCE | | | | | |
| Safety | UL1699B, UL1741, UL1741 SA, UL1741 SB, UL1998, CSA C22.2#107.1, Canadian AFCI according to T.I.L. M-07 | | | | |
| Grid Connection Standards | IEEE 1547-2018, Rule 21, Rule 14 (HI) | | | | |
| Emissions | FCC part 15 class A | | | | |

(1) For other regional settings please contact SolarEdge support.

(2) Where permitted by local regulations.

(3) For specifications of the optional communication options, visit the [Communication product page](#) or the [Resource Library](#) to download the relevant product datasheet.

/ Three Phase Inverter with Synergy Technology

For the 277/480V Grid for North America

SE80KUS / SE100KUS / SE110KUS / SE120KUS

| MODEL NUMBER | SE80KUS | SE100KUS | SE110KUS | SE120KUS |
|--|---|---|----------|----------|
| APPLICABLE TO INVERTERS WITH PART NUMBER | SExxK-USx8Lxxxx | | | UNITS |
| INSTALLATION SPECIFICATIONS | | | | |
| Number of Synergy Units per Inverter | 2 | 3 | | |
| Ac Max Conduit Size | 2 1/2" | | | in |
| Max AWG Line / PE | 4/0 / 1/0 | | | |
| DC Max Conduit Size | 1 x 3"; 2 x 2" | | | in |
| DC Input Inverter/ Synergy Unit | 8 / 4 pairs; 6-12 AWG | 12 / 4 pairs; 6-12 AWG | | |
| | 2 pairs / 1 pair, Max 2 AWG; copper or aluminum | 3 pairs / 1 pair, Max 2 AWG; copper or aluminum | | |
| Dimensions (H x W x D) | Synergy Unit: 22 x 12.9 x 10.75 / 558 x 328 x 273 Synergy Manager: 14.17 x 22.4 x 11.6 / 360 x 560 x 295 | | | in / mm |
| Weight | Synergy Unit: 70.4 / 32 Synergy Manager: 39.6 / 18 | | | lb / kg |
| Operating Temperature Range | -40 to +140 / -40 to +60 ⁽⁴⁾ | | | °F / °C |
| Cooling | Fan (user replaceable) | | | |
| Noise | < 67 | | | dBA |
| Protection Rating | NEMA 3R | | | |
| Mounting | Brackets provided | | | |

(4) For power de-rating information refer to the [Temperature De-rating - Technical Note \(North America\)](#).

DRY TYPE TRANSFORMER SPECIFICATION

TRANSFORMER SPECIFICATION

| | |
|------------------|--------|
| RATING | 150kVA |
| COOLING | ANN |
| TEMPERATURE RISE | 115°C |
| PHASES | 3 |
| FREQUENCY | 60Hz |
| K-FACTOR | 4 |

| | PRIMARY | SECONDARY |
|-------------|----------|-----------|
| VOLTAGE | 600V | 480Y/277V |
| TAPS - FCAN | 2 x 2.5% | - |
| TAPS - FCBN | 2 x 2.5% | - |
| BIL | 10kV | 10kV |

| | |
|----------------------|-------------------------|
| CONDUCTOR | ALUMINUM |
| WINDINGS | POLYESTER RESIN DIPPED |
| INSULATION CLASS | 220°C |
| IMPEDANCE (@ 135°C) | 3.5% - 5.0% |
| MIN EFFICIENCY | 98.83% @ 35% LOAD, 75°C |
| AVG. SOUND LEVEL | 50dBA |
| ELECTROSTATIC SHIELD | NONE |
| EST. WEIGHT | 1320 lbs [600kg] |

TERMINALS AND CABLE LUGS

| | PRIMARY | SECONDARY |
|-----------------|--------------------------------|--------------------|
| LOCATION | FRONT | FRONT |
| LINE LUGS (/PH) | 1 OF 300 MCM-6 AWG | 1 OF 300 MCM-6 AWG |
| NEUTRAL LUGS | N/A | PADS |
| GROUND LUG | 2-14 AWG LUG ON ENCLOSURE BASE | |

WIRING / CONNECTIONS

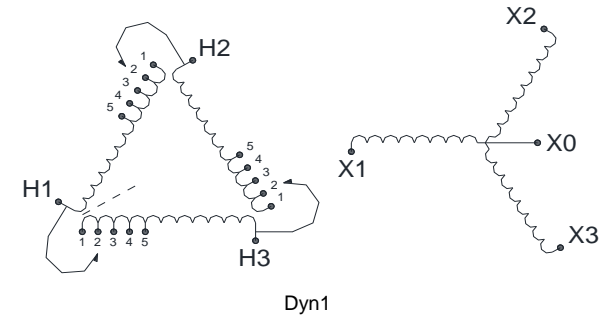
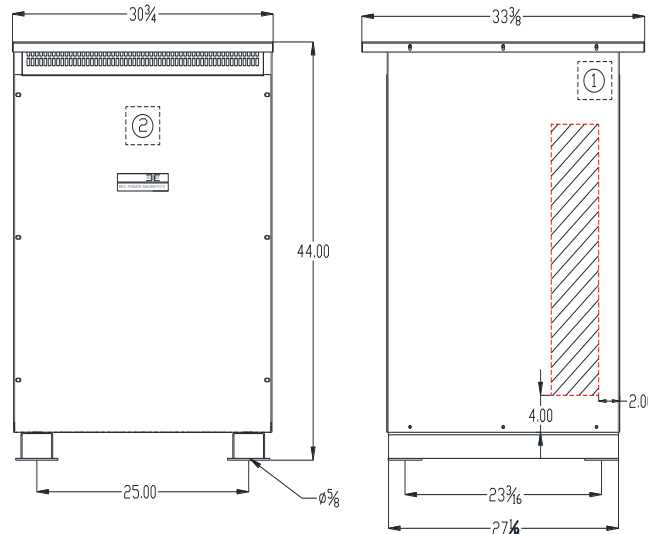
| PRIMARY: H1-H2-H3 | | |
|-------------------|--------|-------------|
| VOLTAGE | % TAP | JUMPERS TO: |
| 630 | 105.0% | 1-1-1 |
| 615 | 102.5% | 2-2-2 |
| 600 | 100.0% | 3-3-3 |
| 585 | 97.5% | 4-4-4 |
| 570 | 95.0% | 5-5-5 |

| SECONDARY: X0-X1-X2-X3 | | |
|------------------------|-------|----------------------------|
| VOLTAGE | PHASE | CONNECT LOAD TO |
| 480 | 3 | X1-X2-X3 |
| 277 | 1 | X0-X1, X0-X2, AND/OR X0-X3 |

FEATURES

- NEOPRENE ANTI-VIBRATION PADS INSTALLED BETWEEN CORE & COIL AND ENCLOSURE BASE
- LUG FOR EARTH GROUNDING PROVIDED
- SUITABLE FOR NON-SINUSOIDAL CURRENT LOAD WITH K-FACTOR NOT TO EXCEED 4
- NEUTRAL SIZED FOR 200% OF LINE CURRENT
- SEISMIC RATED FOR USA ZONE 4 AND CANADA ZONE 6
- CSA CERTIFIED (FILE # LR34493)
- UL LISTED (FILE # E108255)
- ISO 9001 QUALITY MANAGEMENT SYSTEM
- EFFICIENCY MEETS OR EXCEEDS:
 - CANADA: SOR/DORS/2018-201 (NRCAN 2019)
 - CSA: CSA C802.2-18
 - USA: DOE 10 CFR PART 431:2016-01 (DOE 2016)

- 1) Location of nameplate and labels for Canada
 2) Location of nameplate and labels for USA
 *Recommended area for side cable entry (5"x33") on either side



ENCLOSURE

| | |
|------------------|-----------------------|
| ENCLOSURE PART # | E3R-8 |
| ENCLOSURE RATING | TYPE 3R (INDOOR)* |
| CONSTRUCTION | VENTILATED |
| MATERIAL | STEEL |
| FINISH | POLYESTER POWDER COAT |
| COLOR | ANSI/ASA 61 (GREY) |
| MOUNTING | FLOOR |

*SPRINKLERPROOF WHEN THE ANGLE BETWEEN SPRINKLER HEADS AND OPENING IN THE ENCLOSURE DOES NOT EXCEED 45 DEGREE FROM THE VERTICAL.

*FOR PROPER VENTILATION FOR FLOOR INSTALLATION KEEP AT LEAST 6 INCHES FROM ADJACENT WALLS

| REV | REMARKS | BY | DATE | PRELIMINARY DRAWING | PRODUCT | K-FACTOR RATED ISOLATION TRANSFORMER |
|-----|---------|----|------|---|-----------------|--------------------------------------|
| | | | | THIS DRAWING MAY NOT TRULY REFLECT OUR FINAL DESIGN. ANY ORDER(S) MUST BE ACCOMPANIED BY OR REFER TO THIS DRAWING. REX POWER MAGNETICS RESERVES THE RIGHT TO CHANGE OR REVISE THESE SPECIFICATIONS WITHOUT NOTICE | MODEL / CAT No. | BA150J-P/K4/T115/Z3 |
| | | | | | CUSTOMER | - |
| | | | | | PO # | - |
| | | | | | SWO # | - QTY - |
| | | | | | Prepared By | C.G. Date 9/21/2020 |
| | | | | | Approved By | Date - |



Heavy Duty Safety Switches

Selection



| System | Ampere Rating | Indoor — Type 1 | | Outdoor — Type 3R | | Horsepower Rating [Ⓞ] | | | | | | | | 250 Volt DC | 600 Volt DC |
|--------|---------------|-----------------|--------------------------|-------------------|--------------------------|--------------------------------|------|-----------------|------|-----------------|------|-----------------|--|-------------|-------------|
| | | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480V AC | | 600V AC | | | | | | | |
| | | | | | | 1-Phase, 2-Wire | | 3-Phase, 3-Wire | | 1-Phase, 2-Wire | | 3-Phase, 3-Wire | | | |
| Std. | Max. | Std. | Max. | Std. | Max. | Std. | Max. | Std. | Max. | Std. | Max. | | | | |

600 Volt Fusible[Ⓢ]

2-Pole, 2-Fuse[Ⓢ]

| | | | | | | 480 Volt AC/600 Volt AC/600 Volt DC | | | | | | | | | |
|--|-----|-------|----|--------|----|-------------------------------------|----|---|---|----|----|---|---|----|----|
| | 30 | HF261 | 15 | HF261R | 15 | 3 | 7½ | — | — | 3 | 10 | — | — | 5 | 15 |
| | 60 | HF262 | 20 | HF262R | 20 | 5 | 20 | — | — | 10 | 25 | — | — | 10 | 30 |
| | 100 | HF263 | 26 | HF263R | 27 | 10 | 30 | — | — | 15 | 40 | — | — | 20 | 50 |

3-Pole, 3-Fuse

| | | | | | | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|------|-------|---------------------|--------|----------------------|-----|--|-----|-----|-----|----|-----|-----|-----|----|-----------------|
| | 30 | HF361 | 14 | HF361R | 15 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| | 30 | HF361L [Ⓢ] | 19 | HF361RL [Ⓢ] | 20 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| | 60 | HF362 | 19 | HF362R | 20 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| | 60 | — | — | HF362RL [Ⓢ] | 25 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| | 100 | HF363 | 24 | HF363R | 25 | 5 | 20 | 25 | 60 | 15 | 40 | 30 | 75 | 20 | 50 [Ⓢ] |
| | 200 | HF364 | 48 | HF364R | 49 | 25 | 50 | 50 | 125 | 30 | 50 | 60 | 150 | 40 | 50 |
| | 400 | HF365A [Ⓢ] | 93 | HF365RA [Ⓢ] | 157 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| | 600 | HF366A [Ⓢ] | 98 | HF366RA [Ⓢ] | 161 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| | 800 | HF367 | 365 | HF367R | 365 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — |
| 1200 | HF368 | 383 | HF368R | 385 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — | |

3-Pole, 3-Fuse and Solid Neutral

| | | | | | | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|--|------|---------|------|----------|------|--|----|-----|-----|----|----|-----|-----|----|-----------------|
| | 30 | HF361N | 14 | HF361NR | 15 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| | 60 | HF362N | 19 | HF362NR | 20 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| | 100 | HF363N | 25 | HF363NR | 26 | 10 | 30 | 25 | 60 | 15 | 40 | 30 | 75 | 20 | 50 [Ⓢ] |
| | 200 | HF364N | 49 | HF364NR | 50 | 25 | 50 | 50 | 125 | 30 | 50 | 60 | 150 | 40 | 50 |
| | 400 | HF365NA | 94.6 | HF365NRA | 94.6 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| | 600 | HF366NA | 99.6 | HF366NRA | 99.6 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| | 800 | HF367N | 375 | HF367NR | 375 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |
| | 1200 | HF368N | 395 | HF368NR | 388 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |

600 Volt Fusible[Ⓢ] (For 2-Pole Applications use outside poles of 3-Pole Switches)

2-Pole, 2-Fuse[Ⓢ]

| | | | | | | 480 Volt AC/600 Volt AC/600 Volt DC | | | | | | | | | |
|-----|---------------|----------------------------------|--------------------------|---------------------------------|--------------------------|-------------------------------------|------|------|------|------|------|------|------|------|------|
| | Ampere Rating | Type 4/4X Stainless [Ⓢ] | | Type 12 Industrial [Ⓢ] | | Std. | Max. | Std. | Max. | Std. | Max. | Std. | Max. | Std. | Max. |
| | | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 30 | HF261S | 15 | HF261J■ | 15 | 3 | 7½ | — | — | 3 | 10 | — | — | 5 | 15 | |
| 60 | HF262S | 20 | HF262J■ | 20 | 5 | 20 | — | — | 10 | 25 | — | — | 10 | 30 | |
| 100 | HF263S■ | 27 | HF263J■ | 27 | 10 | 30 | — | — | 15 | 40 | — | — | 20 | 50 | |

3-Pole, 3-Fuse

| | | | | | | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|--|------|----------------------|-----|----------------------|-----|--|---|-----|-----|---|---|-----|-----|----|-----------------|
| | 30 | HF361S | 13 | HF361J | 14 | — | — | 5 | 15 | — | — | 7½ | 20 | 5 | — |
| | 60 | HF362S | 20 | HF362J | 20 | — | — | 15 | 30 | — | — | 15 | 50 | 10 | 30 [Ⓢ] |
| | 100 | HF363S | 25 | HF363J | 25 | — | — | 25 | 60 | — | — | 30 | 75 | 20 | 50 [Ⓢ] |
| | 200 | HF364S | 49 | HF364J | 49 | — | — | 50 | 125 | — | — | 60 | 150 | 40 | 50 |
| | 400 | HF365SA [Ⓢ] | 93 | HF365JA [Ⓢ] | 93 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| | 400 | HF365SSA | 93 | — | — | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| | 600 | HF366SA [Ⓢ] | 98 | HF366JA [Ⓢ] | 98 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| | 600 | HF366SSA | 98 | — | — | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| | 800 | HF367S | 370 | HF367J■ | 365 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — |
| | 1200 | HF368S■ | 388 | HF368J■ | 388 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |

■ Built to order. Allow 3-5 weeks for delivery.

Ⓢ 60-600A 3-Pole switches are also rated 600V DC.

Ⓢ Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

Ⓢ Use 3-Pole switch for 200A applications.

Ⓢ Dual horsepower ratings: Std.- applies when non-time delay fuses are installed. Max.- applies when time-delay fuses are installed.

Ⓢ Suitable for use as service entrance equipment except on 1200 Amp solidly grounded wye systems per NEC 230.95.

Ⓢ Also rated Type 3S/3R.

Ⓢ Indicates oversized enclosure (30A switch with 60A lugs in a 60A enclosure or 60A switch with 100A lugs in a 100A enclosure).

Ⓢ 600V DC & 600V DC horsepower rating shown requires (2) poles to be connected in series.

Ⓢ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 4-18.

General and Heavy Duty Safety Switches

Dimensions

Safety Switch Dimensions (Inches)* & Shipping Weights

| Catalog Number | Height | | | Width | | Depth | | Knockout Diagram [Ⓞ] | Shipping Weight (lbs.) |
|---------------------|--------|-------------|------------------|-------|---------------|-------|---------------|-------------------------------|------------------------|
| | Box A | With Door B | With Rain Shed C | Box D | With Handle E | Box F | With Handle G | | |
| HF223S also HF263S | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 24 |
| HF224J | 29.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 48 |
| HF224N | 29.9 | 31.07 | — | 14.62 | 16.98 | 6.36 | 12.33 | S12 | 47 |
| HF224NR | 29.9 | — | 31.42 | 14.61 | 16.99 | 6.36 | 12.33 | S13 | 48 |
| HF224S | 29.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 48 |
| HF225NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 91.1 |
| HF225NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 91.1 |
| HF226NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 95.6 |
| HF226NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 95.6 |
| HF227N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 360 |
| HF227NR | 66.67 | — | 67.74 | 38.4 | 39.96 | 9.24 | 14.68 | — | 362 |
| HF228N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 362 |
| HF228NR | 66.67 | — | 67.74 | 38.4 | 39.96 | 9.24 | 14.68 | — | 364 |
| HF365A | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 93 |
| HF365JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 93 |
| HF365RA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 93 |
| HF365SA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF365SSA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF366A | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 98 |
| HF366JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 98 |
| HF366RA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 98 |
| HF366SA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF366SSA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF321J | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 14 |
| HF321N | 14.26 | 15.45 | — | 6.64 | 9.01 | 5.05 | 10.17 | S6 | 14 |
| HF321NR | 14.39 | — | 15.77 | 6.64 | 9.01 | 5.05 | 10.17 | S8 | 15 |
| HF321S, SS | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 14 |
| HF322J | 16.27 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 20 |
| HF322N | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 19 |
| HF322NR | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 20 |
| HF322S, SS | 16.27 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 20 |
| HF323J | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 25 |
| HF323N | 21.95 | 23.15 | — | 9.64 | 12.01 | 5.05 | 10.17 | S10 | 25 |
| HF323NR | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 26 |
| HF323S, SS | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 25 |
| HF324J | 29.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 49 |
| HF324N | 29.9 | 31.07 | — | 14.62 | 16.98 | 6.36 | 12.33 | S12 | 49 |
| HF324NR | 29.9 | — | 31.42 | 14.61 | 16.99 | 6.36 | 12.33 | S13 | 50 |
| HF324S, SS | 21.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 49 |
| HF325JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 93 |
| HF325NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 94.6 |
| HF325NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 94.6 |
| HF325SA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF325SSA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF326JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 98 |
| HF326NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 99.6 |
| HF326NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 99.6 |
| HF326SA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF326SSA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF327J | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 367 |
| HF327N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 380 |
| HF327NR | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 383 |
| HF327S | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 367 |
| HF328N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 382 |
| HF328NR | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 385 |
| HF361, PV, PVPG | 14.26 | 15.45 | — | 6.64 | 9.01 | 5.05 | 10.17 | S6 | 14 |
| HF361J, JW | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 14 |
| HF361L | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 19 |
| HF361N | 14.26 | 15.45 | — | 6.64 | 9.01 | 5.05 | 10.17 | S6 | 14 |
| HF361NR | 14.39 | — | 15.77 | 6.64 | 9.01 | 5.05 | 10.17 | S8 | 15 |
| HF361R, RPV, RPVPG | 14.39 | — | 15.77 | 6.64 | 9.01 | 5.05 | 10.17 | S8 | 15 |
| HF361RL, RW | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 20 |
| HF361S, SS, SSW, SW | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 15 |
| HF362, PV, PVPG | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 19 |

*For inches / millimeters conversion, multiply inches by 25.4.

Ⓞ Knocks not provided on Type 4 / 4X and 12 or in 800 & 1200A switches.

CASE STUDY

100KW SYSTEM ON MIDRISE RESIDENTIAL BUILDING

BUILDING TYPE:

Apartment building with 396 panels (portrait orientation) of 350W for each panel (total 138.6 kW DC)

SYSTEM SIZE:

3 x SMA Core1 33.3kW inverters (total of 100kW)

SYSTEM LAYOUT:

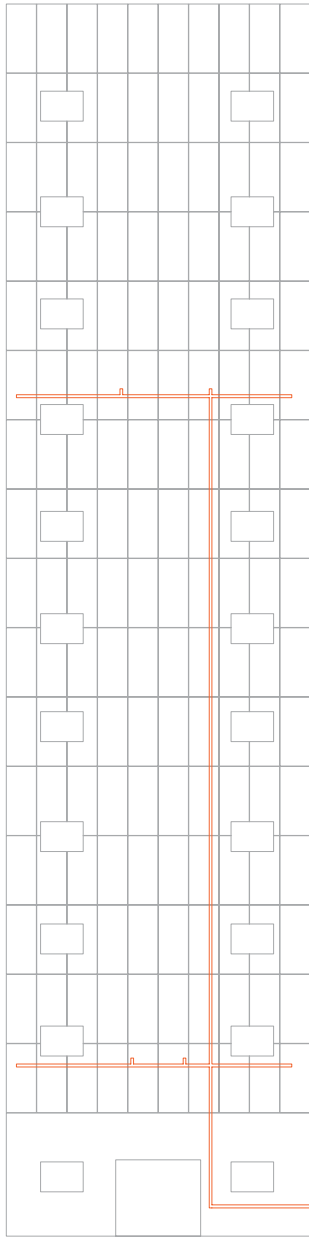
36 strings of 11 panels with two building penetration holes (Conduit size 2x3")

PROJECT SOLAR EQUIPMENT:

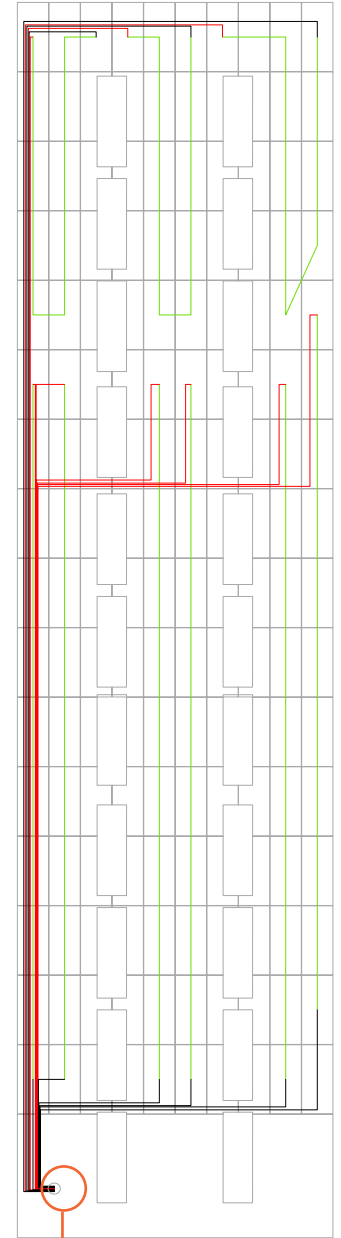
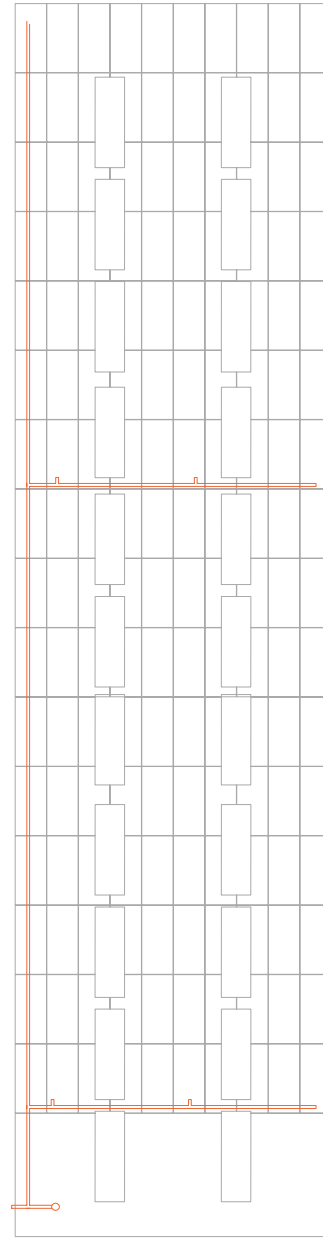
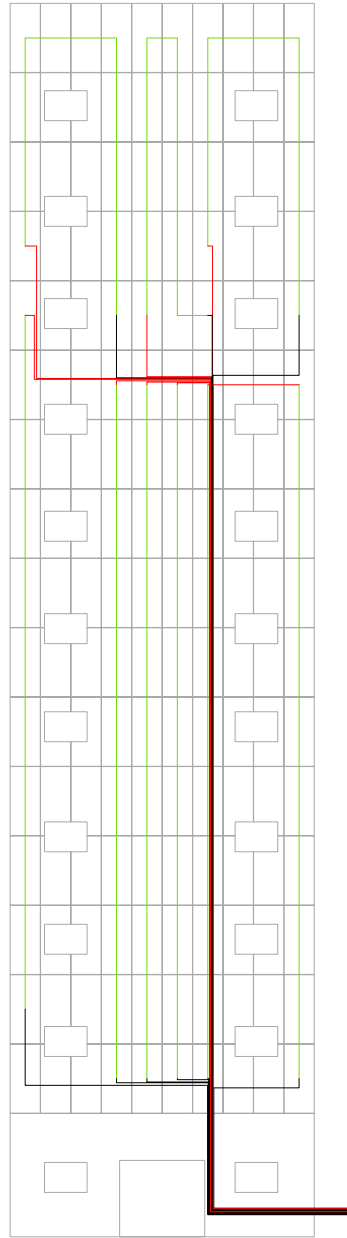
One AC panel of 200A 600V, ONE 150kVA transformer 480V/600V, two more disconnect

100kW SYSTEM WIRING LAYOUT: HOME RUN TO BUILDING BASEMENT

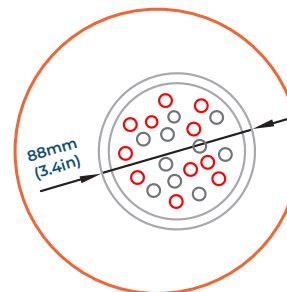
EAST ELEVATION



WEST ELEVATION



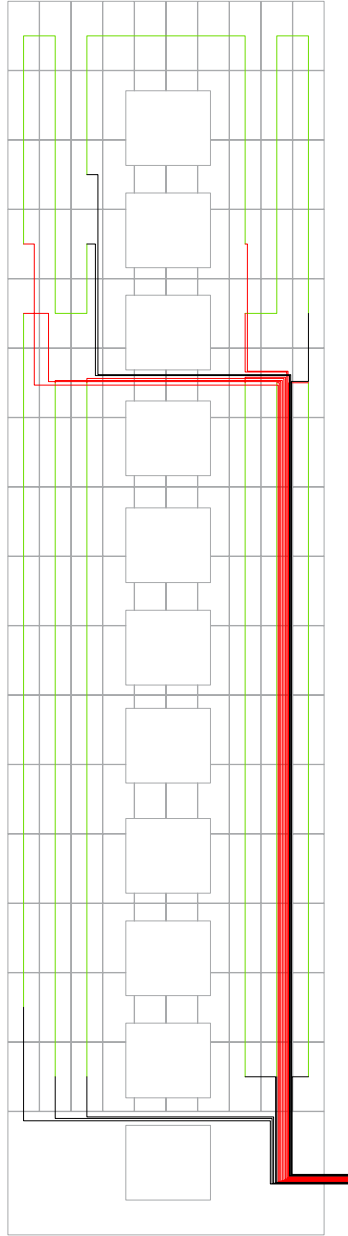
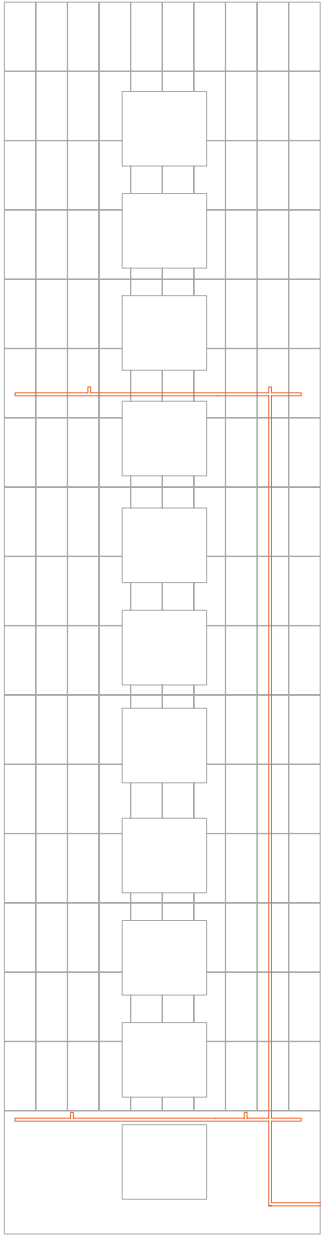
- LINE COLOUR REFERENCE
- Building & solar panels layout
 - Conduit layout
 - Electrical strings
 - Home run wiring



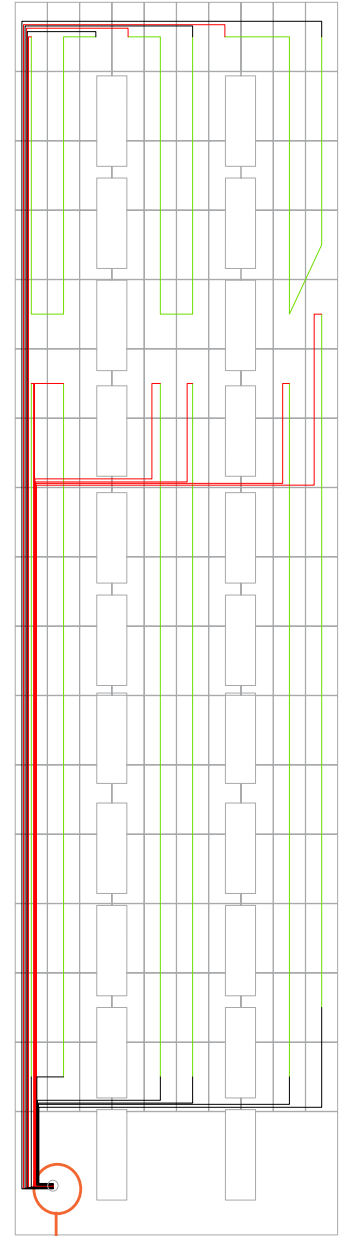
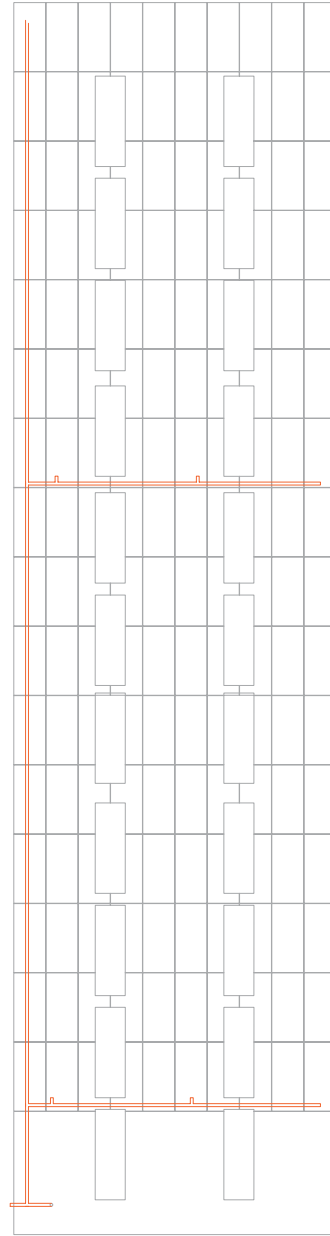
BUILDING PENETRATION FOR CONDUIT TO INVERTER

100kW SYSTEM WIRING LAYOUT: HOME RUN TO BUILDING BASEMENT

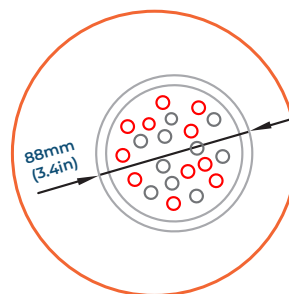
NORTH ELEVATION



SOUTH ELEVATION



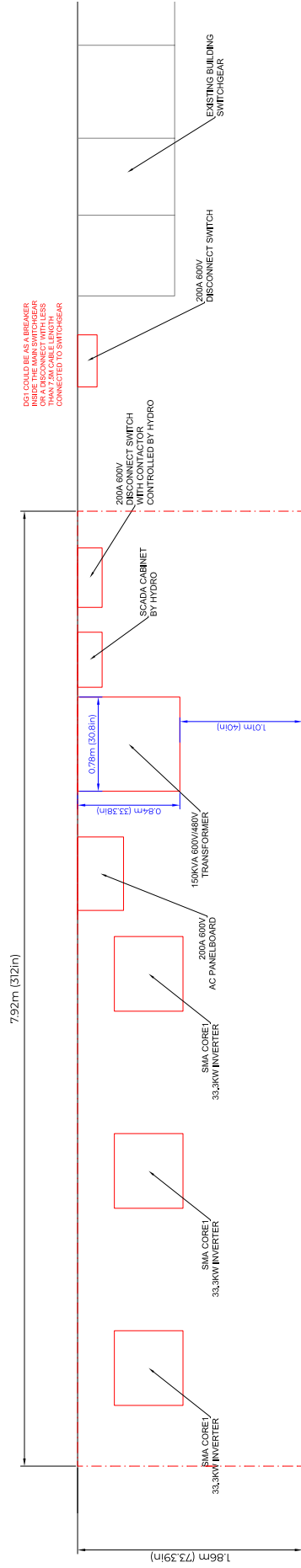
- LINE COLOUR REFERENCE
- Building & solar panels layout
 - Conduit layout
 - Electrical strings
 - Home run wiring



BUILDING PENETRATION FOR CONDUIT TO INVERTER

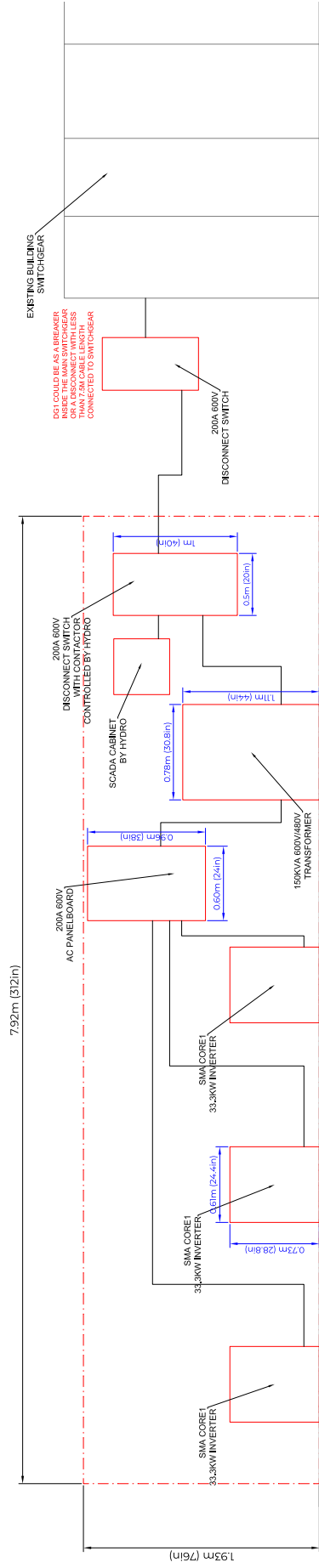
REQUIRED SPACE FOR SOLAR EQUIPMENT: PLACED ON THE BASEMENT

TOP VIEW



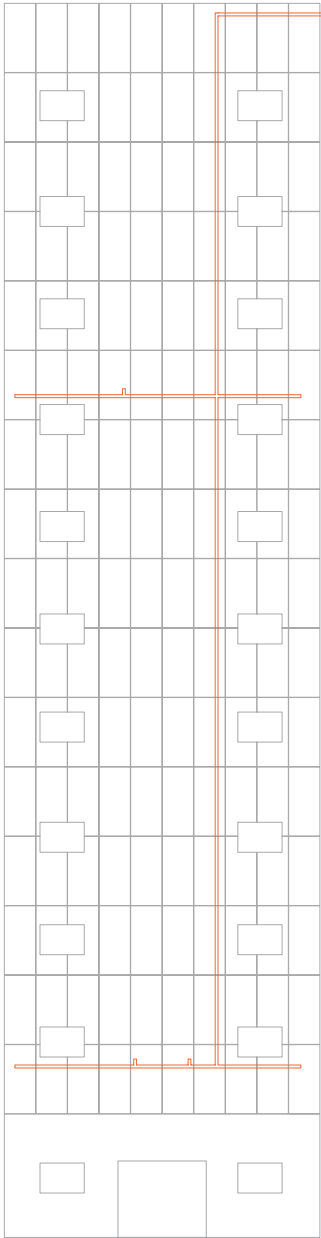
Note: Working area is 1m (39.37in) in front of solar equipments as per electrical code.

FRONT VIEW

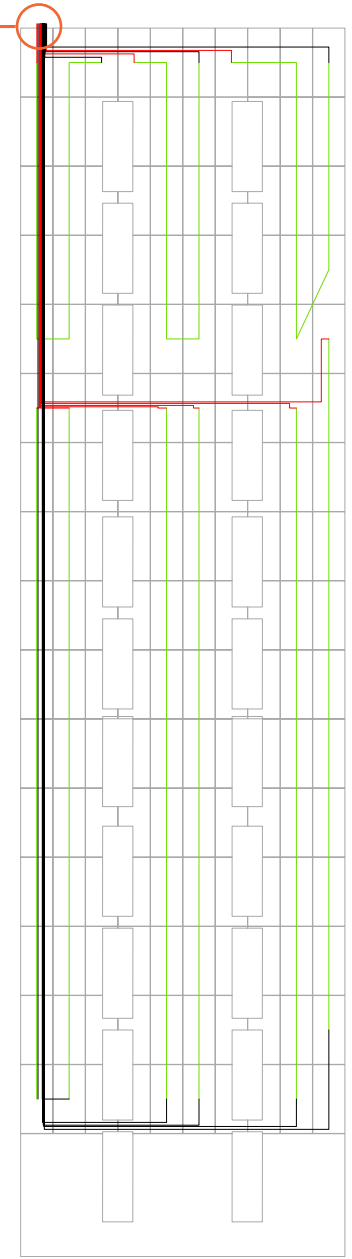
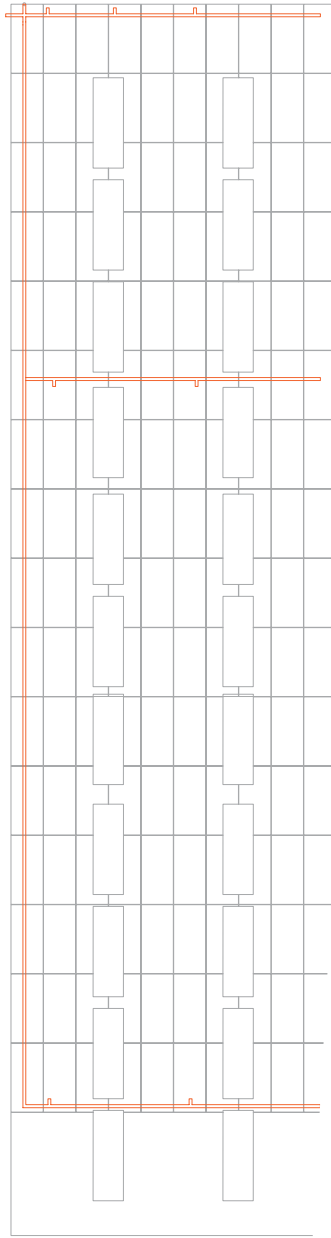
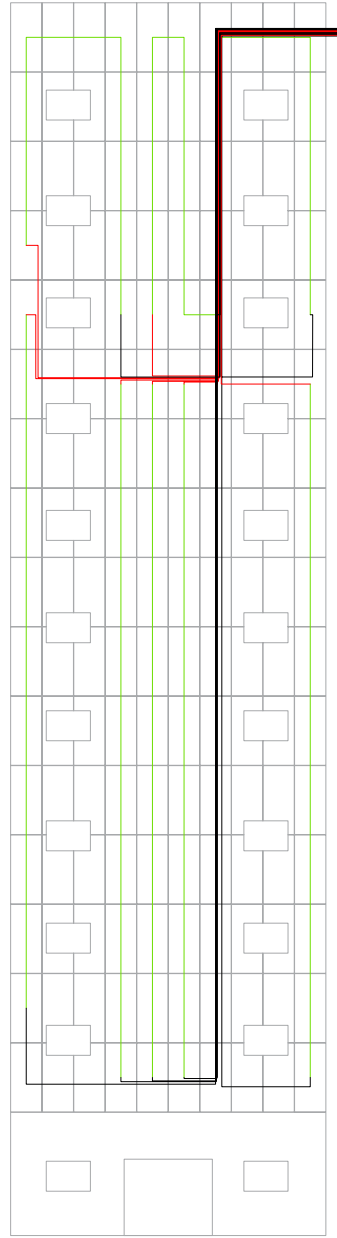


100kW SYSTEM WIRING LAYOUT: HOME RUN TO BUILDING ROOFTOP

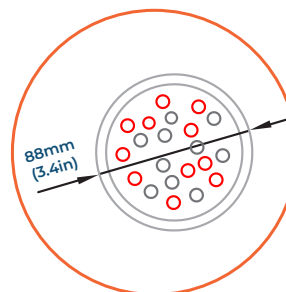
EAST ELEVATION



WEST ELEVATION



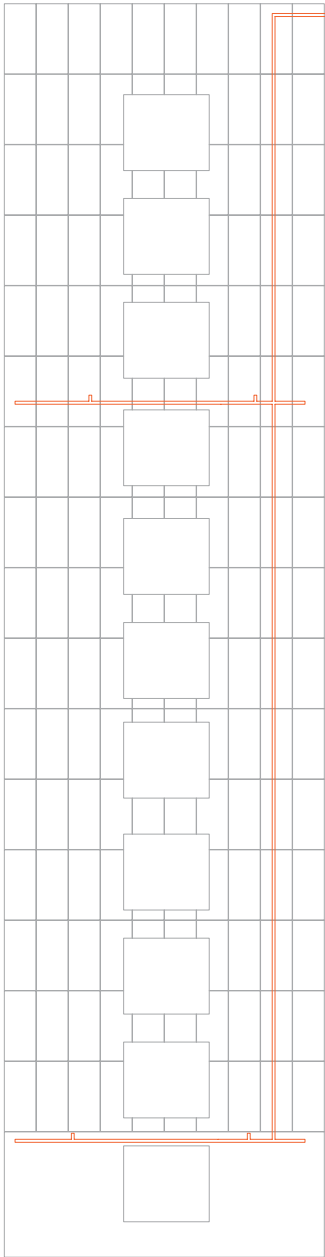
- LINE COLOUR REFERENCE
- Building & solar panels layout
 - Conduit layout
 - Electrical strings
 - Home run wiring



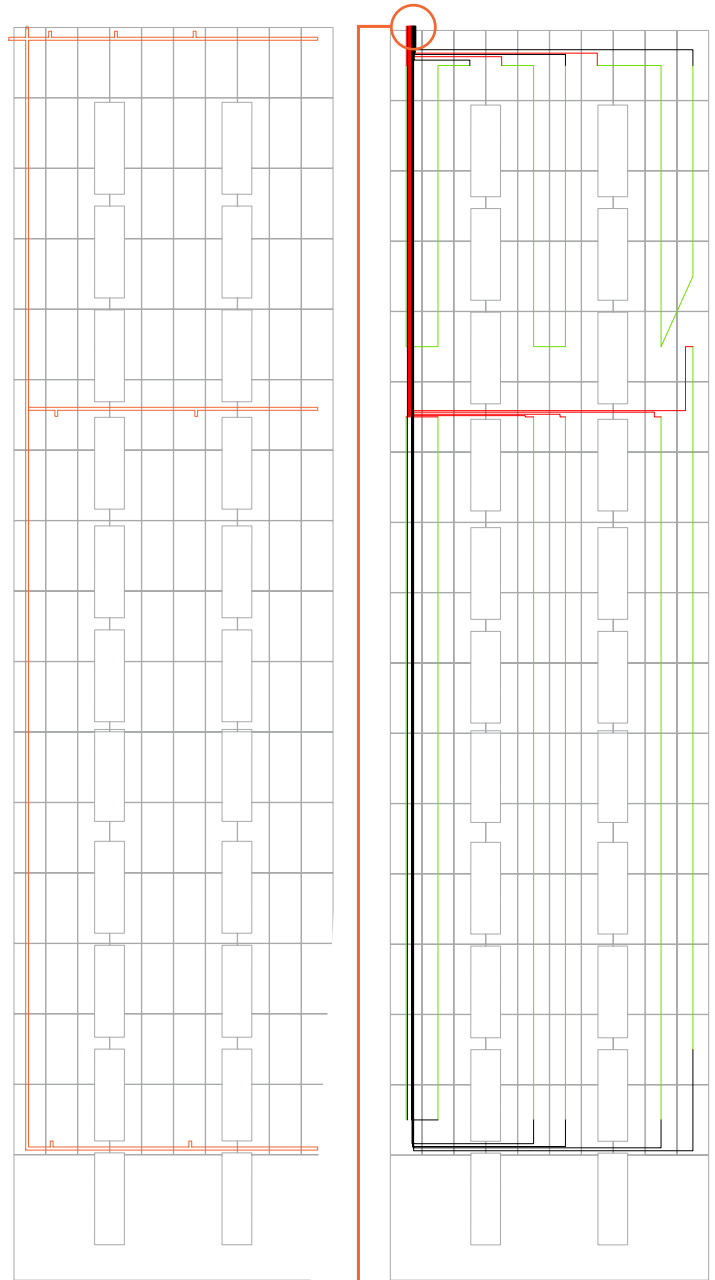
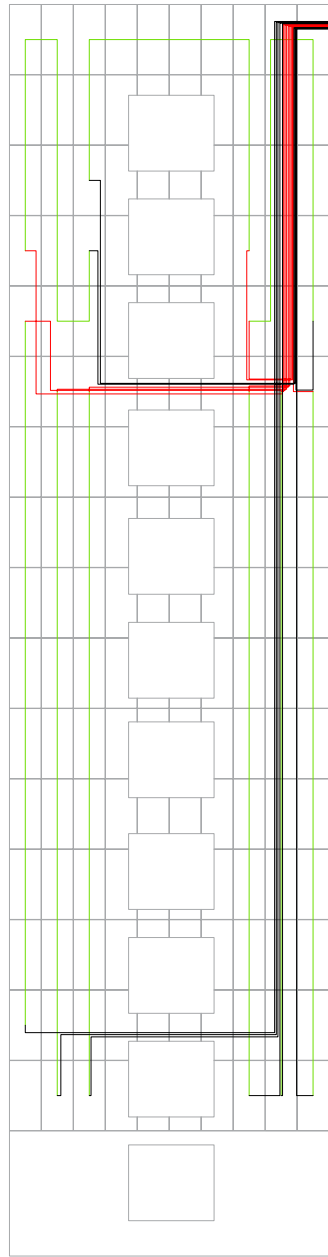
BUILDING PENETRATION FOR CONDUIT TO INVERTER

100kW SYSTEM WIRING LAYOUT: HOME RUN TO BUILDING ROOFTOP

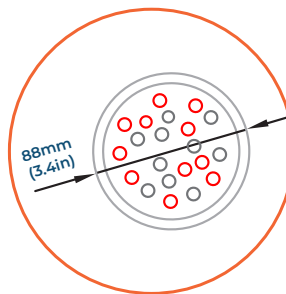
NORTH ELEVATION



SOUTH ELEVATION



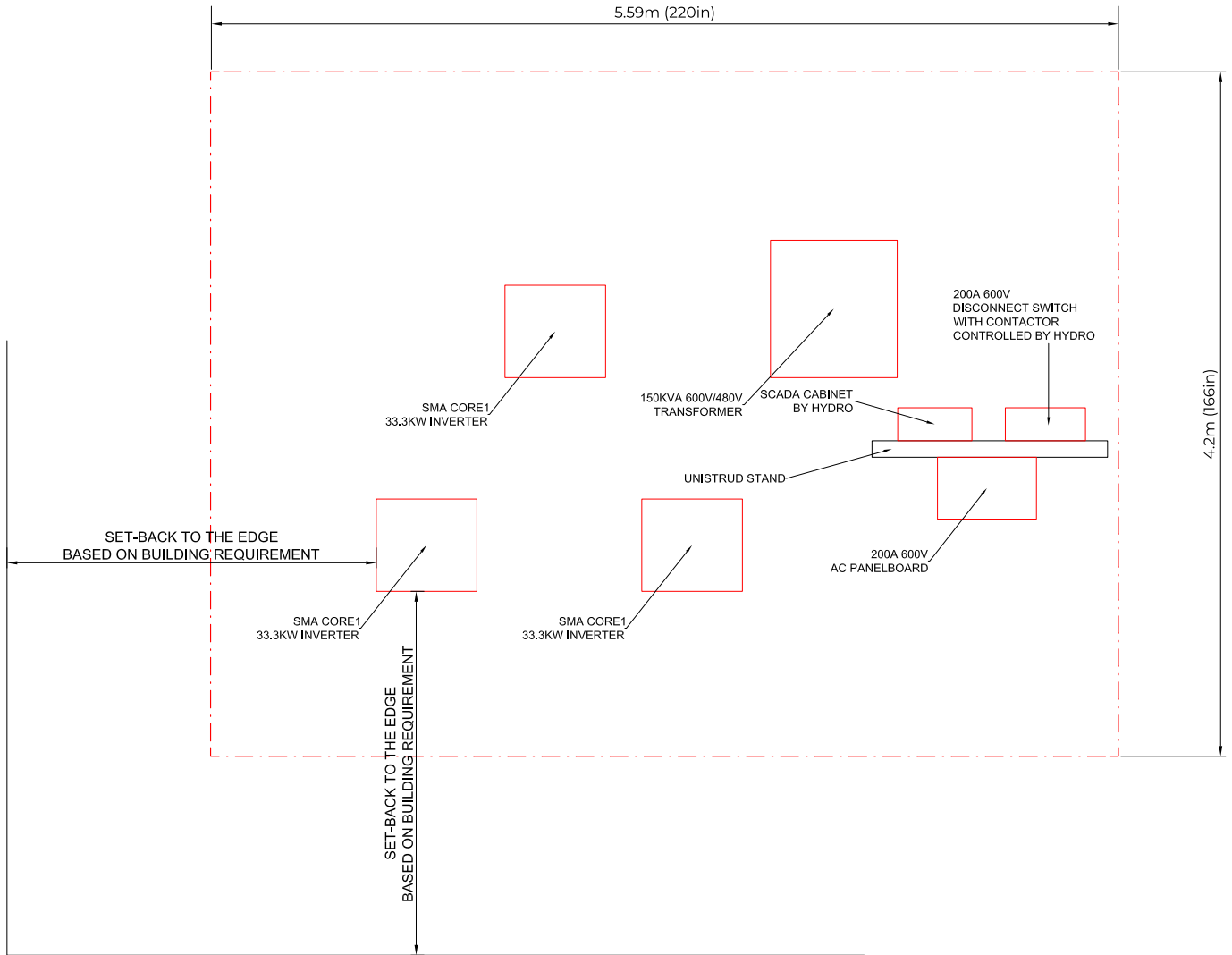
- LINE COLOUR REFERENCE
- Building & solar panels layout
 - Conduit layout
 - Electrical strings
 - Home run wiring



BUILDING PENETRATION FOR CONDUIT TO INVERTER

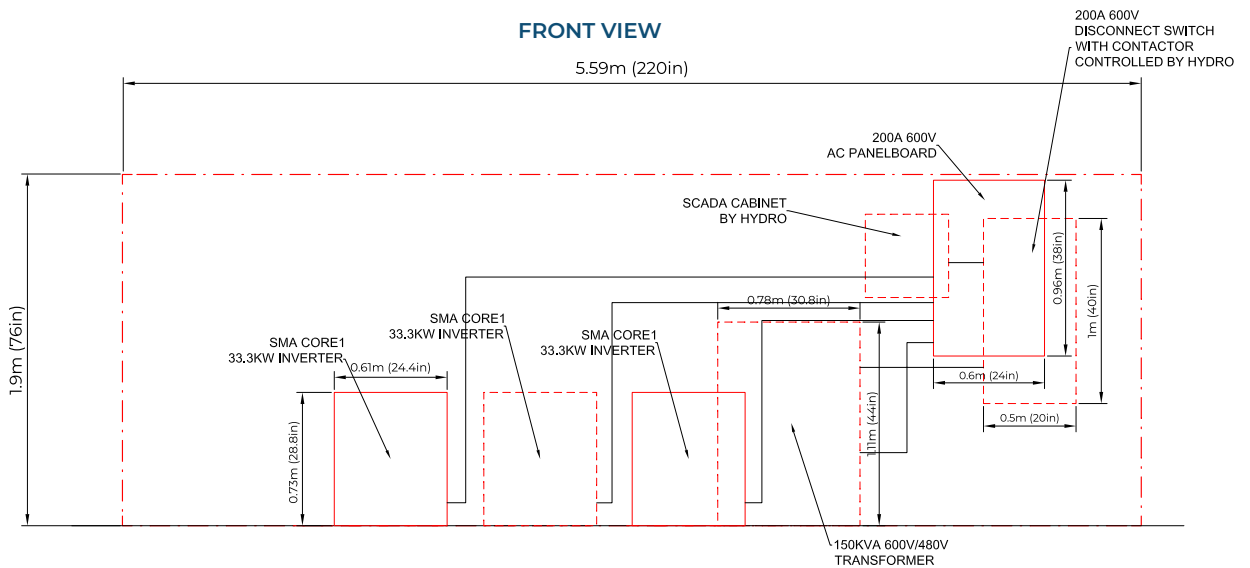
REQUIRED SPACE FOR SOLAR EQUIPMENT: **PLACED ON THE BASEMENT**

TOP VIEW



Note: Working area is 1m (39.37in) in front of solar equipments as per electrical code.

FRONT VIEW





SUNNY TRIPOWER CORE1 33-US / 50-US / 62-US

STP 33-US-41 / STP 50-US-41 / STP 62-US-41

**UP TO 60% FASTER
INSTALLATION FOR
COMMERCIAL PV SYSTEMS**



Fully integrated

- Innovative design requires no additional racking for rooftop installation
- Integrated DC and AC disconnects and overvoltage protection
- 12 direct string inputs for reduced labor and material costs

Increased power, flexibility

- Multiple power ratings for small to large scale commercial PV installations
- Six MPP trackers for flexible stringing and maximum power production
- ShadeFix, SMA's proprietary shade management solution, optimizes at the string level

Enhanced safety, reliability

- Integrated SunSpec PLC signal for module-level rapid shutdown compliance to 2017 NEC
- Next-gen DC AFCI arc-fault protection certified to new Standard UL 1699B Ed. 1

Smart monitoring, control, service

- Advanced smart inverter grid support capabilities
- Increased ROI with SMA ennexOS cross sector energy management platform
- SMA Smart Connected proactive O&M solution reduces time spent diagnosing and servicing in the field

SUNNY TRIPOWER CORE1 33-US / 50-US / 62-US

It stands on its own

The Sunny Tripower CORE1 is the world's first free-standing PV inverter for commercial rooftops, carports, ground mount and repowering legacy solar projects. From distribution to construction to operation, the Sunny Tripower CORE1 enables logistical, material, labor and service cost reductions, and is the most versatile, cost-effective commercial solution available. Integrated SunSpec PLC for rapid shutdown and enhanced DC AFCI arc-fault protection ensure compliance to the latest safety codes and standards. With Sunny Tripower CORE1 and SMA's ennexOS cross sector energy management platform, system integrators can deliver comprehensive commercial energy solutions for increased ROI.

| Technical data | Sunny Tripower CORE1 33-US | Sunny Tripower CORE1 50-US | Sunny Tripower CORE1 62-US |
|--|--|----------------------------|----------------------------|
| Input (DC) | | | |
| Maximum array power | 50000 Wp STC | 75000 Wp STC | 93750 Wp STC |
| Maximum system voltage | 1000 V | | |
| Rated MPP voltage range | 330 V... 800 V | 500 V... 800 V | 550 V... 800 V |
| MPPT operating voltage range | 150 V... 1000 V | | |
| Minimum DC voltage / start voltage | 150 V / 188 V | | |
| MPP trackers / strings per MPP input | 6/2 | | |
| Maximum operating input current / per MPP tracker | 120 A / 20 A | | |
| Maximum short circuit current per MPPT / per string input | 30 A / 30 A | | |
| Output (AC) | | | |
| AC nominal power | 33300 W | 50000 W | 62500 W |
| Maximum apparent power | 33300 VA | 53000 VA | 66000 VA |
| Output phases / line connections | 3 / 3-(N)-PE | | |
| Nominal AC voltage | 480 V / 277 V WYE | | |
| AC voltage range | 244 V... 305 V | | |
| Maximum output current | 40 A | 64 A | 80 A |
| Rated grid frequency | 60 Hz | | |
| Grid frequency / range | 50 Hz, 60 Hz / -6 Hz... +6Hz | | |
| Power factor at rated power / adjustable displacement | 1 / 0.0 leading... 0.0 lagging | | |
| Harmonics THD | <3% | | |
| Efficiency | | | |
| CEC efficiency | 97.5% | 97.5% | 97.5% |
| Protection and safety features | | | |
| Load rated DC disconnect | ● | | |
| Load rated AC disconnect | ● | | |
| Ground fault monitoring: Riso / Differential current | ●/● | | |
| DC AFCI arc-fault protection | ● | | |
| SunSpec PLC signal for rapid shutdown | ● | | |
| DC reverse polarity protection | ● | | |
| AC short circuit protection | ● | | |
| DC surge protection: Type 2 / Type 1+2 | ○/○ | | |
| AC surge protection: Type 2 / Type 1+2 | ○/○ | | |
| Protection class / overvoltage category (as per UL 840) | I/IV | | |
| General data | | | |
| Device dimensions (W/H/D) | 621 mm / 733 mm / 569 mm (24.4 in x 28.8 in x 22.4 in) | | |
| Device weight | 84 kg (185 lbs) | | |
| Operating temperature range | -25 °C... +60 °C (-13 °F... +140 °F) | | |
| Storage temperature range | -40 °C... +70 °C (-40 °F... +158 °F) | | |
| Audible noise emissions (full power @ 1m and 25 °C) | 65 dB(A) | | |
| Internal consumption at night | 5 W | | |
| Topology | Transformerless | | |
| Cooling concept | OptiCool (forced convection, variable speed fans) | | |
| Enclosure protection rating | Type 4X, 3SX (as per UL 50E) | | |
| Maximum permissible relative humidity (non-condensing) | 100% | | |
| Additional information | | | |
| Mounting | Free-standing with included mounting feet | | |
| DC connection | Amphenol UTX PV connectors | | |
| AC connection | Screw terminals - 4 AWG to 4/0 AWG CU/AL | | |
| LED indicators (Status / Fault / Communication) | ● | | |
| Network interfaces: Ethernet / WLAN / RS485 | ● (2 ports) / ● / ○ | | |
| Data protocols: SMA Modbus / SunSpec Modbus / Webconnect | ● / ● / ● | | |
| Multifunction relay | ● | | |
| ShadeFix technology for string level optimization | ● | | |
| Integrated Plant Control / Q on Demand 24/7 | ● / ● | | |
| Off-Grid capable / SMA Fuel Save Controller compatible | ● / ● | | |
| SMA Smart Connected (proactive monitoring and service support) | ● | | |
| Certifications | | | |
| Certifications and approvals | UL 1741, UL 1699B Ed. 1, UL 1998, CSA 22.2 107-1, PV Rapid Shutdown System Equipment | | |
| FCC compliance | FCC Part 15 Class A | | |
| Grid interconnection standards | IEEE 1547, UL 1741 SA - CA Rule 21, HECO Rule 14H | | |
| Advanced grid support capabilities | L/HFRT, L/HVRT, Volt-VAr, Volt-Watt, Frequency-Watt, Ramp Rate Control, Fixed Power Factor | | |
| Warranty | | | |
| Standard | 10 years | | |
| Optional extensions | 15 / 20 years | | |
| ○ Optional features ● Standard features - Not available | | | |
| Type designation | STP 33-US-41 | STP 50-US-41 | STP 62-US-41 |



SMA Data Manager M
EDMM-US-10



SMA Sensor Module
MD.SEN-US-40



Universal Mounting System
UMS_KIT-10



AC Surge Protection Module Kit
AC_SPD_KIT1-10, AC_SPD_KIT2_T1T2
DC Surge Protection Module Kit
DC_SPD_KIT4-10, DC_SPD_KIT5_T1T2

DRY TYPE TRANSFORMER SPECIFICATION

TRANSFORMER SPECIFICATION

| | |
|------------------|--------|
| RATING | 150kVA |
| COOLING | ANN |
| TEMPERATURE RISE | 115°C |
| PHASES | 3 |
| FREQUENCY | 60Hz |
| K-FACTOR | 4 |

| | PRIMARY | SECONDARY |
|-------------|----------|-----------|
| VOLTAGE | 600V | 480Y/277V |
| TAPS - FCAN | 2 x 2.5% | - |
| TAPS - FCBN | 2 x 2.5% | - |
| BIL | 10kV | 10kV |

| | |
|----------------------|-------------------------|
| CONDUCTOR | ALUMINUM |
| WINDINGS | POLYESTER RESIN DIPPED |
| INSULATION CLASS | 220°C |
| IMPEDANCE (@ 135°C) | 3.5% - 5.0% |
| MIN EFFICIENCY | 98.83% @ 35% LOAD, 75°C |
| AVG. SOUND LEVEL | 50dBA |
| ELECTROSTATIC SHIELD | NONE |
| EST. WEIGHT | 1320 lbs [600kg] |

TERMINALS AND CABLE LUGS

| | PRIMARY | SECONDARY |
|-----------------|--------------------------------|--------------------|
| LOCATION | FRONT | FRONT |
| LINE LUGS (/PH) | 1 OF 300 MCM-6 AWG | 1 OF 300 MCM-6 AWG |
| NEUTRAL LUGS | N/A | PADS |
| GROUND LUG | 2-14 AWG LUG ON ENCLOSURE BASE | |

WIRING / CONNECTIONS

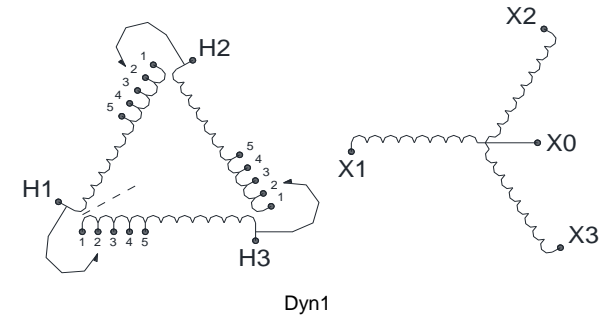
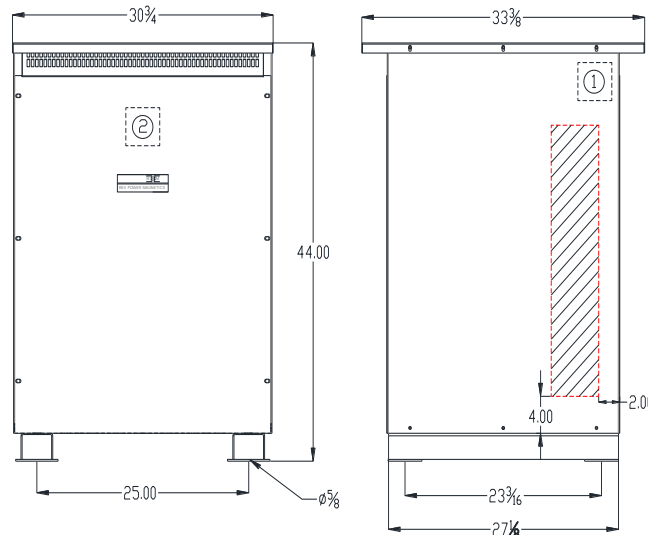
| PRIMARY: H1-H2-H3 | | |
|-------------------|--------|-------------|
| VOLTAGE | % TAP | JUMPERS TO: |
| 630 | 105.0% | 1-1-1 |
| 615 | 102.5% | 2-2-2 |
| 600 | 100.0% | 3-3-3 |
| 585 | 97.5% | 4-4-4 |
| 570 | 95.0% | 5-5-5 |

| SECONDARY: X0-X1-X2-X3 | | |
|------------------------|-------|----------------------------|
| VOLTAGE | PHASE | CONNECT LOAD TO |
| 480 | 3 | X1-X2-X3 |
| 277 | 1 | X0-X1, X0-X2, AND/OR X0-X3 |

FEATURES

- NEOPRENE ANTI-VIBRATION PADS INSTALLED BETWEEN CORE & COIL AND ENCLOSURE BASE
- LUG FOR EARTH GROUNDING PROVIDED
- SUITABLE FOR NON-SINUSOIDAL CURRENT LOAD WITH K-FACTOR NOT TO EXCEED 4
- NEUTRAL SIZED FOR 200% OF LINE CURRENT
- SEISMIC RATED FOR USA ZONE 4 AND CANADA ZONE 6
- CSA CERTIFIED (FILE # LR34493)
- UL LISTED (FILE # E108255)
- ISO 9001 QUALITY MANAGEMENT SYSTEM
- EFFICIENCY MEETS OR EXCEEDS:
 - CANADA: SOR/DORS/2018-201 (NRCAN 2019)
 - CSA: CSA C802.2-18
 - USA: DOE 10 CFR PART 431:2016-01 (DOE 2016)

- 1) Location of nameplate and labels for Canada
 2) Location of nameplate and labels for USA
 *Recommended area for side cable entry (5"x33") on either side



ENCLOSURE

| | |
|------------------|-----------------------|
| ENCLOSURE PART # | E3R-8 |
| ENCLOSURE RATING | TYPE 3R (INDOOR)* |
| CONSTRUCTION | VENTILATED |
| MATERIAL | STEEL |
| FINISH | POLYESTER POWDER COAT |
| COLOR | ANSI/ASA 61 (GREY) |
| MOUNTING | FLOOR |

*SPRINKLERPROOF WHEN THE ANGLE BETWEEN SPRINKLER HEADS AND OPENING IN THE ENCLOSURE DOES NOT EXCEED 45 DEGREE FROM THE VERTICAL.

*FOR PROPER VENTILATION FOR FLOOR INSTALLATION KEEP AT LEAST 6 INCHES FROM ADJACENT WALLS

| REV | REMARKS | BY | DATE | PRELIMINARY DRAWING | PRODUCT | K-FACTOR RATED ISOLATION TRANSFORMER |
|-----|---------|----|------|---|-----------------|--------------------------------------|
| | | | | THIS DRAWING MAY NOT TRULY REFLECT OUR FINAL DESIGN. ANY ORDER(S) MUST BE ACCOMPANIED BY OR REFER TO THIS DRAWING. REX POWER MAGNETICS RESERVES THE RIGHT TO CHANGE OR REVISE THESE SPECIFICATIONS WITHOUT NOTICE | MODEL / CAT No. | BA150J-P/K4/T115/Z3 |
| | | | | | CUSTOMER | - |
| | | | | | PO # | - |
| | | | | | SWO # | - QTY - |
| | | | | | Prepared By | C.G. Date 9/21/2020 |
| | | | | | Approved By | Date - |



Heavy Duty Safety Switches

Selection



| System | Ampere Rating | Indoor — Type 1 | | Outdoor — Type 3R | | Horsepower Rating [Ⓞ] | | | | | | | | 250 Volt DC | 600 Volt DC |
|--------|---------------|-----------------|--------------------------|-------------------|--------------------------|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|--|--|-------------|-------------|
| | | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480V AC | | 600V AC | | | | | | | |
| | | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | | | | |

600 Volt Fusible[Ⓢ]

2-Pole, 2-Fuse[Ⓢ]

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/600 Volt DC | | | | | | | | | |
|---------------|----------------|--------------------------|----------------|--------------------------|-------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|---|----|----|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | | | | |
| 30 | HF261 | 15 | HF261R | 15 | 3 | 7½ | — | — | 3 | 10 | — | — | 5 | 15 |
| 60 | HF262 | 20 | HF262R | 20 | 5 | 20 | — | — | 10 | 25 | — | — | 10 | 30 |
| 100 | HF263 | 26 | HF263R | 27 | 10 | 30 | — | — | 15 | 40 | — | — | 20 | 50 |

3-Pole, 3-Fuse

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|---------------|---------------------|--------------------------|----------------------|--------------------------|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----|-----|----|-----------------|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | | | | |
| 30 | HF361 | 14 | HF361R | 15 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| 30 | HF361L [Ⓢ] | 19 | HF361RL [Ⓢ] | 20 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| 60 | HF362 | 19 | HF362R | 20 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| 60 | — | — | HF362RL [Ⓢ] | 25 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| 100 | HF363 | 24 | HF363R | 25 | 5 | 20 | 25 | 60 | 15 | 40 | 30 | 75 | 20 | 50 [Ⓢ] |
| 200 | HF364 | 48 | HF364R | 49 | 25 | 50 | 50 | 125 | 30 | 50 | 60 | 150 | 40 | 50 |
| 400 | HF365A [Ⓢ] | 93 | HF365RA [Ⓢ] | 157 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 600 | HF366A [Ⓢ] | 98 | HF366RA [Ⓢ] | 161 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 800 | HF367 | 365 | HF367R | 365 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — |
| 1200 | HF368 | 383 | HF368R | 385 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — |

3-Pole, 3-Fuse and Solid Neutral

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|---------------|----------------|--------------------------|----------------|--------------------------|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----|-----|----|-----------------|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | | | | |
| 30 | HF361N | 14 | HF361NR | 15 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| 60 | HF362N | 19 | HF362NR | 20 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| 100 | HF363N | 25 | HF363NR | 26 | 10 | 30 | 25 | 60 | 15 | 40 | 30 | 75 | 20 | 50 [Ⓢ] |
| 200 | HF364N | 49 | HF364NR | 50 | 25 | 50 | 50 | 125 | 30 | 50 | 60 | 150 | 40 | 50 |
| 400 | HF365NA | 94.6 | HF365NRA | 94.6 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 600 | HF366NA | 99.6 | HF366NRA | 99.6 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 800 | HF367N | 375 | HF367NR | 375 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |
| 1200 | HF368N | 395 | HF368NR | 388 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |

600 Volt Fusible[Ⓢ] (For 2-Pole Applications use outside poles of 3-Pole Switches)

2-Pole, 2-Fuse[Ⓢ]

| Ampere Rating | Type 4/4X Stainless [Ⓢ] | | Type 12 Industrial [Ⓢ] | | 480 Volt AC/600 Volt AC/600 Volt DC | | | | | | | | | |
|---------------|----------------------------------|--------------------------|---------------------------------|--------------------------|-------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|---|----|----|
| | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | | | | |
| 30 | HF261S | 15 | HF261J■ | 15 | 3 | 7½ | — | — | 3 | 10 | — | — | 5 | 15 |
| 60 | HF262S | 20 | HF262J■ | 20 | 5 | 20 | — | — | 10 | 25 | — | — | 10 | 30 |
| 100 | HF263S■ | 27 | HF263J■ | 27 | 10 | 30 | — | — | 15 | 40 | — | — | 20 | 50 |

3-Pole, 3-Fuse

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|---------------|----------------------|--------------------------|----------------------|--------------------------|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----|-----|----|-----------------|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | | | | |
| 30 | HF361S | 13 | HF361J | 14 | — | — | 5 | 15 | — | — | 7½ | 20 | 5 | — |
| 60 | HF362S | 20 | HF362J | 20 | — | — | 15 | 30 | — | — | 15 | 50 | 10 | 30 [Ⓢ] |
| 100 | HF363S | 25 | HF363J | 25 | — | — | 25 | 60 | — | — | 30 | 75 | 20 | 50 [Ⓢ] |
| 200 | HF364S | 49 | HF364J | 49 | — | — | 50 | 125 | — | — | 60 | 150 | 40 | 50 |
| 400 | HF365SA [Ⓢ] | 93 | HF365JA [Ⓢ] | 93 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 400 | HF365SSA | 93 | — | — | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 600 | HF366SA [Ⓢ] | 98 | HF366JA [Ⓢ] | 98 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 600 | HF366SSA | 98 | — | — | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 800 | HF367S | 370 | HF367J■ | 365 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — |
| 1200 | HF368S■ | 388 | HF368J■ | 388 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |

■ Built to order. Allow 3-5 weeks for delivery.

Ⓢ 60-600A 3-Pole switches are also rated 600V DC.

Ⓢ Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

Ⓢ Use 3-Pole switch for 200A applications.

Ⓢ Dual horsepower ratings: Std.- applies when non-time delay fuses are installed. Max.- applies when time-delay fuses are installed.

Ⓢ Suitable for use as service entrance equipment except on 1200 Amp solidly grounded wye systems per NEC 230.95.

Ⓢ Also rated Type 3S/3R.

Ⓢ Indicates oversized enclosure (30A switch with 60A lugs in a 60A enclosure or 60A switch with 100A lugs in a 100A enclosure).

Ⓢ 600V DC & 600V DC horsepower rating shown requires (2) poles to be connected in series.

Ⓢ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 4-18.

General and Heavy Duty Safety Switches

Dimensions

Safety Switch Dimensions (Inches)* & Shipping Weights

| Catalog Number | Height | | | Width | | Depth | | Knockout Diagram [Ⓞ] | Shipping Weight (lbs.) |
|---------------------|--------|-------------|------------------|-------|---------------|-------|---------------|-------------------------------|------------------------|
| | Box A | With Door B | With Rain Shed C | Box D | With Handle E | Box F | With Handle G | | |
| HF223S also HF263S | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 24 |
| HF224J | 29.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 48 |
| HF224N | 29.9 | 31.07 | — | 14.62 | 16.98 | 6.36 | 12.33 | S12 | 47 |
| HF224NR | 29.9 | — | 31.42 | 14.61 | 16.99 | 6.36 | 12.33 | S13 | 48 |
| HF224S | 29.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 48 |
| HF225NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 91.1 |
| HF225NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 91.1 |
| HF226NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 95.6 |
| HF226NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 95.6 |
| HF227N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 360 |
| HF227NR | 66.67 | — | 67.74 | 38.4 | 39.96 | 9.24 | 14.68 | — | 362 |
| HF228N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 362 |
| HF228NR | 66.67 | — | 67.74 | 38.4 | 39.96 | 9.24 | 14.68 | — | 364 |
| HF365A | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 93 |
| HF365JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 93 |
| HF365RA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 93 |
| HF365SA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF365SSA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF366A | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 98 |
| HF366JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 98 |
| HF366RA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 98 |
| HF366SA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF366SSA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF321J | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 14 |
| HF321N | 14.26 | 15.45 | — | 6.64 | 9.01 | 5.05 | 10.17 | S6 | 14 |
| HF321NR | 14.39 | — | 15.77 | 6.64 | 9.01 | 5.05 | 10.17 | S8 | 15 |
| HF321S, SS | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 14 |
| HF322J | 16.27 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 20 |
| HF322N | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 19 |
| HF322NR | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 20 |
| HF322S, SS | 16.27 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 20 |
| HF323J | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 25 |
| HF323N | 21.95 | 23.15 | — | 9.64 | 12.01 | 5.05 | 10.17 | S10 | 25 |
| HF323NR | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 26 |
| HF323S, SS | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 25 |
| HF324J | 29.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 49 |
| HF324N | 29.9 | 31.07 | — | 14.62 | 16.98 | 6.36 | 12.33 | S12 | 49 |
| HF324NR | 29.9 | — | 31.42 | 14.61 | 16.99 | 6.36 | 12.33 | S13 | 50 |
| HF324S, SS | 21.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 49 |
| HF325JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 93 |
| HF325NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 94.6 |
| HF325NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 94.6 |
| HF325SA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF325SSA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF326JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 98 |
| HF326NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 99.6 |
| HF326NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 99.6 |
| HF326SA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF326SSA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF327J | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 367 |
| HF327N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 380 |
| HF327NR | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 383 |
| HF327S | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 367 |
| HF328N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 382 |
| HF328NR | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 385 |
| HF361, PV, PVPG | 14.26 | 15.45 | — | 6.64 | 9.01 | 5.05 | 10.17 | S6 | 14 |
| HF361J, JW | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 14 |
| HF361L | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 19 |
| HF361N | 14.26 | 15.45 | — | 6.64 | 9.01 | 5.05 | 10.17 | S6 | 14 |
| HF361NR | 14.39 | — | 15.77 | 6.64 | 9.01 | 5.05 | 10.17 | S8 | 15 |
| HF361R, RPV, RPVPG | 14.39 | — | 15.77 | 6.64 | 9.01 | 5.05 | 10.17 | S8 | 15 |
| HF361RL, RW | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 20 |
| HF361S, SS, SSW, SW | 14.27 | 17.33 | — | 6.65 | 9.02 | 5.32 | 10.46 | — | 15 |
| HF362, PV, PVPG | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 19 |

*For inches / millimeters conversion, multiply inches by 25.4.

Ⓞ Knocks not provided on Type 4 / 4X and 12 or in 800 & 1200A switches.

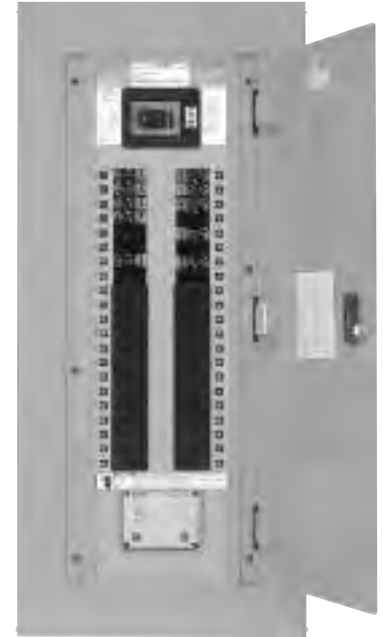
Application

Type P1 Panelboards

Table P1-3 – Main Breaker Panel Size Selector

| Maximum Ampere Rating | Main Breaker Types | Max. No. of Poles | Dimensions in Inches (mm) | | |
|-----------------------|---------------------------------|-------------------|---------------------------|--------------|---------------------|
| | | | Unit Space A | Box Height B | Weight In lbs. (kg) |
| 100 | BL, BLH | 18 30 42 | 9 (229) | 32 (813) | 105 (48) |
| | HBL | | 15 (381) | 38 (965) | 120 (55) |
| | BQD | | 21 (533) | 44 (1118) | 135 (61) |
| 125 | NGB | | 9 (229) | 32 (813) | 110 (50) |
| | | | 15 (381) | 38 (965) | 125 (57) |
| | | | 21 (533) | 44 (1118) | 140 (64) |
| 225 | ED2, ED4, ED6, HED4, HED6 | | 9 (229) | 32 (813) | 110 (50) |
| | | | 15 (381) | 38 (965) | 125 (57) |
| | | | 21 (533) | 44 (1118) | 140 (64) |
| 250 | QJ2 | | 9 (229) | 32 (813) | 110 (50) |
| | QJH2 | | 15 (381) | 38 (965) | 125 (57) |
| | QJ2-H | | 21 (533) | 44 (1118) | 140 (64) |
| 250 | FXD6 | 9 (229) | 32 (813) | 115 (52) | |
| | FD6 | 15 (381) | 38 (965) | 130 (59) | |
| | HFD6, HFXD6 | 21 (533) | 44 (1118) | 145 (66) | |
| ≤ 250 | MLO | 9 (229) | 32 (813) | 115 (52) | |
| | | 15 (381) | 38 (365) | 125 (57) | |
| | | 21 (533) | 44 (1118) | 135 (61) | |
| 400 | JD6, JXD6 | 18 30 42 | 9 (229) | 56 (1422) | 172 (78) |
| | HJD6 | | 15 (381) | 62 (1575) | 190 (86) |
| | HJXD6 | | 21 (533) | 68 (1727) | 208 (95) |
| | | | 9 (229) | 56 (1422) | 115 (52) |
| | MLO | | 15 (381) | 62 (1575) | 130 (59) |
| | | | 21 (533) | 68 (1722) | 145 (66) |

Note: Main breakers use breaker connectors. For sizes, see breaker connector chart. 400 amp main breaker panel has wire bending space for 600 kcmil cables as standard. Use 750 Kcmil lug if 600 Kcmil cable is to be used.


Table P1-4 – Main Breaker Selection

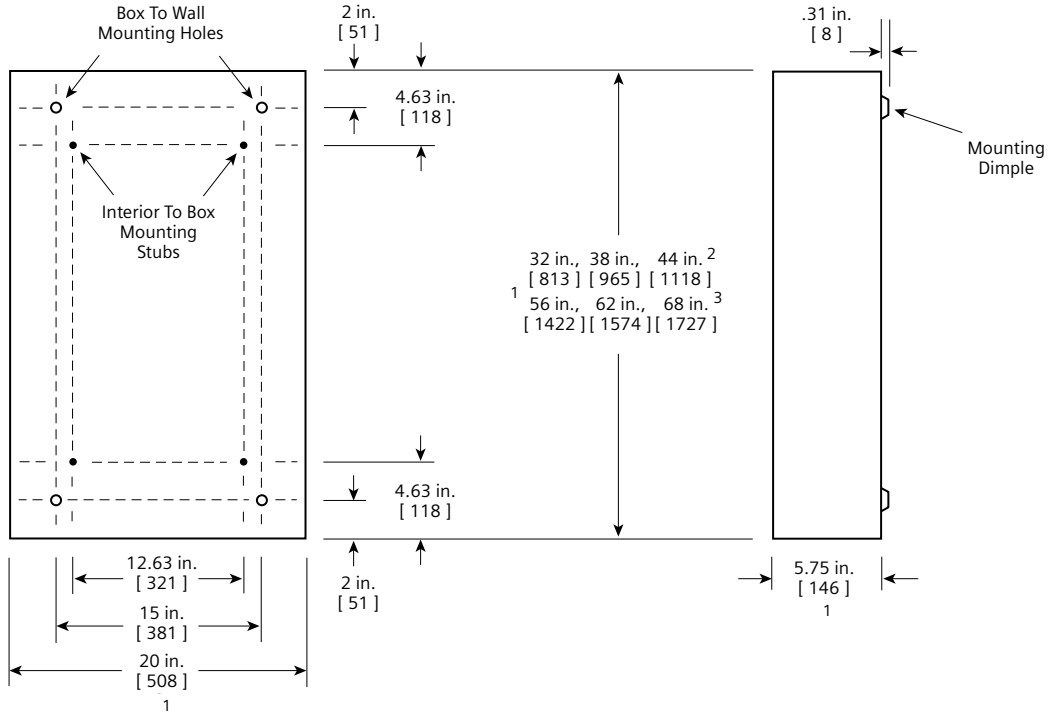
| Ampere Rating | Breaker Type | Max. IR (kA) at | | Additional Trip Values |
|---------------|--------------|-----------------|-------------|---|
| | | 240V AC | 480/277V AC | |
| 100 | BL (STD) | 10 | — | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| | BLH | 22 | — | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| | HBL | 65 | — | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| | BQD | 65 | 14 | 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 |
| 125 | NGB (STD) | 100 | 25 | 50, 60, 70, 80, 90, 100, 110, 125 |
| | ED4 (STD) | 65 | 25 | 50, 60, 70, 80, 90, 100, 110, 125 |
| | HED4 | 100 | 42 | 50, 60, 70, 80, 90, 100, 110, 125 |
| 225 | QJ2 (STD) | 10 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| | QJH2 | 22 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| | QJ2-H | 42 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| | HQJ2H | 100 | — | 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225 |
| 250 | FXD6 (STD) | 65 | 35 | 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250 |
| | FD6 | 65 | 35 | 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250 |
| | HFD6 | 100 | 65 | 70, 80, 90, 100, 150, 175, 200, 225, 250 |
| | HFXD6 | 100 | 65 | 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250 |
| 400 | JXD6 (STD) | 65 | 35 | 200, 225, 250, 300, 350, 400 |
| | JD6 | 65 | 35 | 200, 225, 250, 300, 350, 400 |
| | HJD6 | 100 | 65 | 200, 225, 250, 300, 350, 400 |
| | HJXD6 | 100 | 65 | 200, 225, 250, 300, 350, 400 |

Dimensions

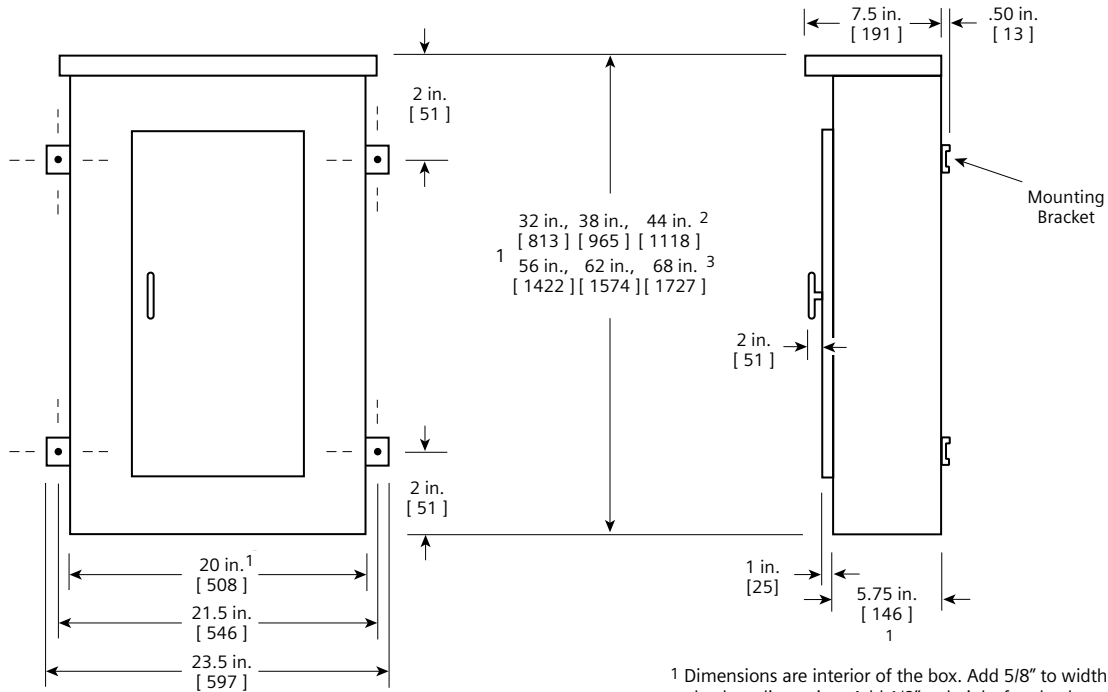
Type P1 Panelboards

Type 1 Box

Box is symmetrical



Type 3R and 3R/12 Box



¹ Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.

² 250 Amp panel.

³ 400 Amp panel.

Dimensions shown in inches and millimeters [].

CASE STUDY

500KW SYSTEM ON MIDRISE INDUSTRIAL BUILDING

BUILDING TYPE:

Industrial building with 1920 panels of 320W (total 614.4 kW DC)

SYSTEM SIZE:

5 x 100kW Solaredge inverter SE100KUS

SYSTEM LAYOUT:

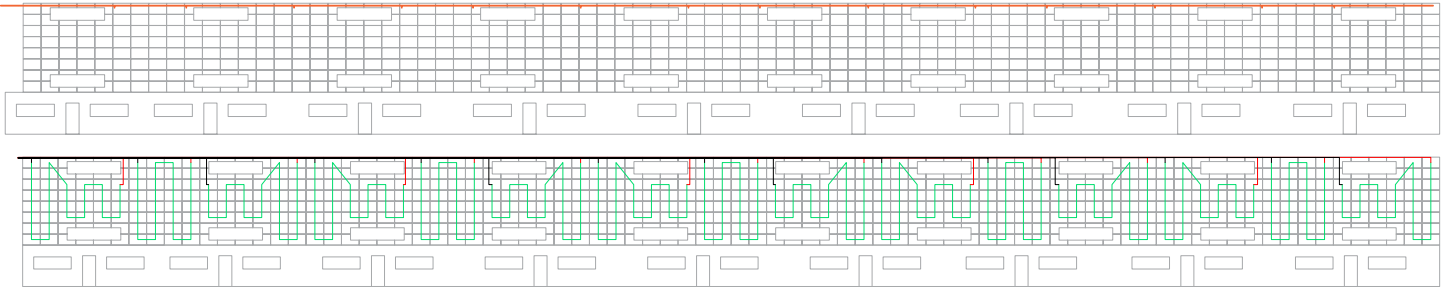
60 strings of 32 panels with two building penetration holes (Conduit size 4")

PROJECT SOLAR EQUIPMENT:

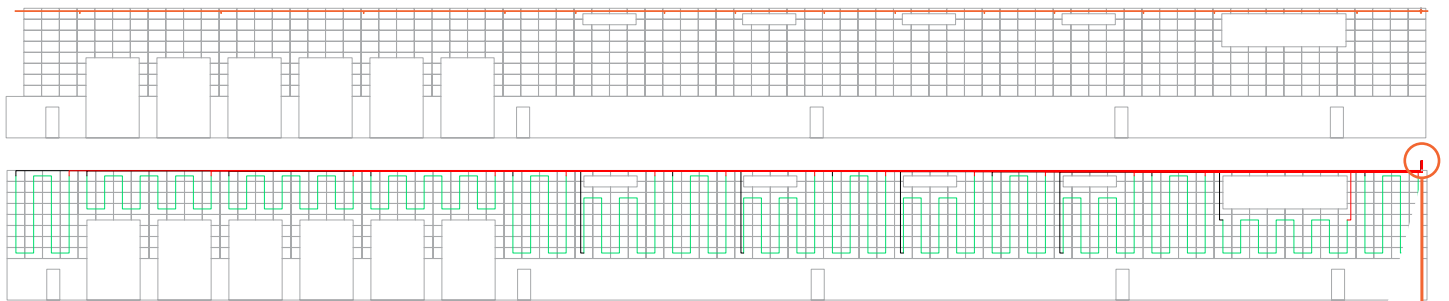
One AC Panelboard 800A 600V, One 500kVA transformer 480V/600V, two 600A 600V disconnect switches (One could be replaced with breaker inside the main building switchboard if available)

500kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING BASEMENT

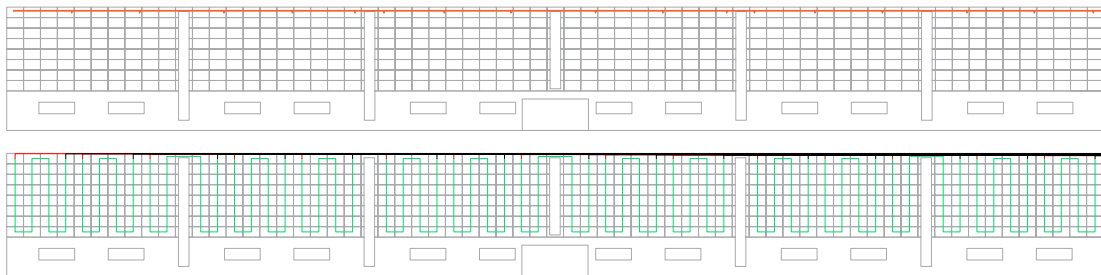
EAST ELEVATION



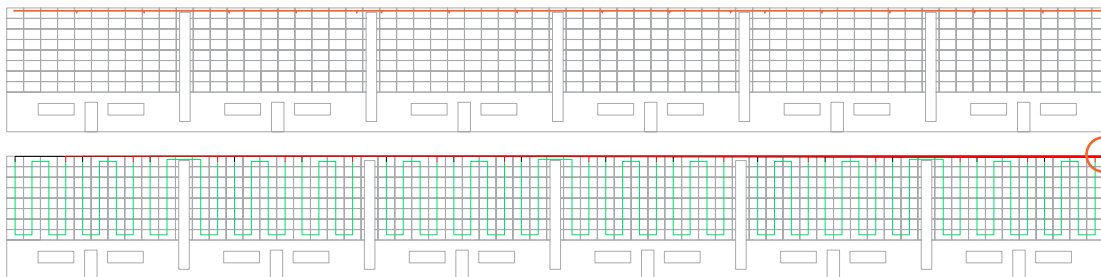
WEST ELEVATION



NORTH ELEVATION



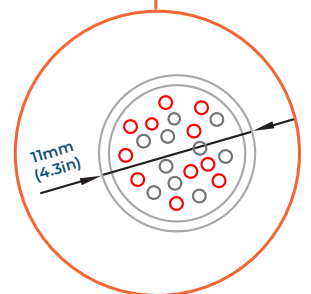
SOUTH ELEVATION



LINE COLOUR REFERENCE

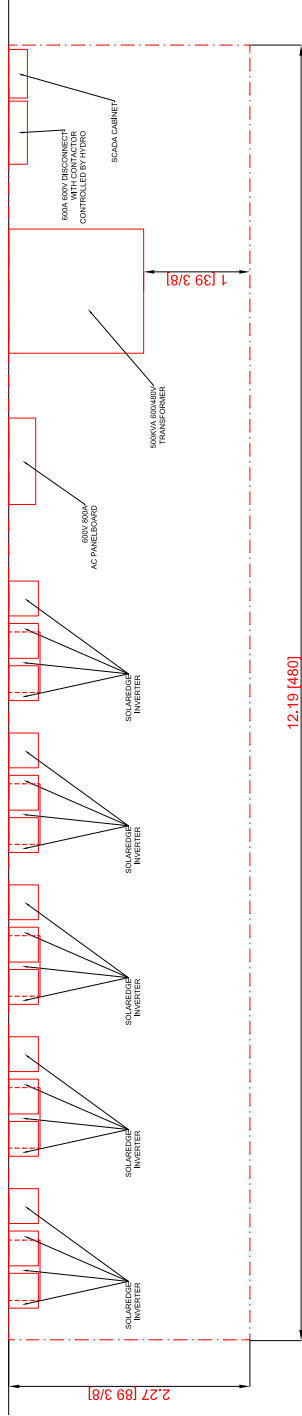
- Building & solar panels layout
- Conduit layout
- Electrical strings
- Home run wiring

BUILDING PENETRATION FOR CONDUIT TO INVERTER



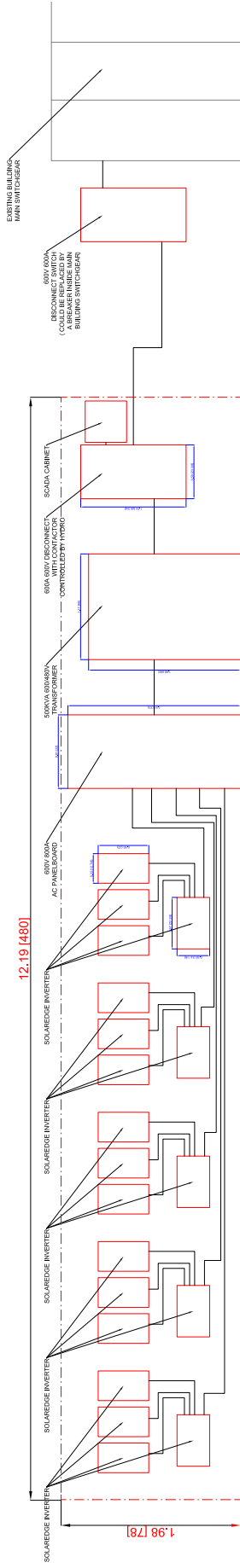
500kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING BASEMENT

TOP VIEW



Note: Working area is 1m (39.37in) in front of solar equipments as per electrical code.

FRONT VIEW



Three Phase Inverter with Synergy Technology

For the 277/480V Grid for North America

SE80KUS / SE100KUS / SE110KUS / SE120KUS



Powered by unique pre-commissioning process for rapid system installation

- Pre-commissioning feature for automated validation of system components and wiring during the site installation process and prior to grid connection
- Easy 2-person installation with lightweight, modular design (each inverter consists of 2 or 3 Synergy units and 1 Synergy Manager)
- Independent operation of each Synergy unit enables higher uptime and easy serviceability
- Built-in thermal sensors detect faulty wiring, ensuring enhanced protection and safety
- Built-in arc fault protection and rapid shutdown
- Built-in PID mitigation for maximized system performance
- Monitored* and field-replaceable surge protection devices, to better withstand surges caused by lightning or other events
- Built-in module-level monitoring with Ethernet or cellular communication for full system visibility

*Applicable only for DC and AC SPDs

/ Three Phase Inverter with Synergy Technology

For the 277/480V Grid for North America

SE80KUS / SE100KUS / SE110KUS / SE120KUS

| MODEL NUMBER | SE80KUS | SE100KUS | SE110KUS | SE120KUS | |
|--|--|----------------|----------------|----------|-------|
| APPLICABLE TO INVERTERS WITH PART NUMBER | SExxK-USx8lxxxx | | | | UNITS |
| OUTPUT | | | | | |
| Rated AC Active Output Power | 80000 | 100000 | 110000 | 120000 | W |
| Maximum AC Apparent Output Power | 80000 | 100000 | 120000 | 120000 | VA |
| AC Output Line Connections | 3W + PE, 4W + PE | | | | |
| Supported Grids | WYE: TN-C, TN-S, TN-C-S, TT, IT; Delta: IT | | | | |
| AC Output Voltage Minimum-Nominal-Maximum ⁽¹⁾ (L-N) | 244 – 277 – 305 | | | | Vac |
| AC Output Voltage Minimum-Nominal-Maximum ⁽¹⁾ (L-L) | 422.5 – 480 – 529 | | | | Vac |
| AC Frequency Min-Nom-Max ⁽¹⁾ | 59.5 – 60 – 60.5 | | | | Hz |
| Maximum Continuous Output Current (per Phase, PF=1) | 96.5 | 120 | 144.3 | | Aac |
| GFDI Threshold | 1 | | | | A |
| Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds | Yes | | | | |
| Total Harmonic Distortion | ≤ 3 | | | | % |
| Power Factor Range | +/-0.2 to 1 | | | | |
| INPUT | | | | | |
| Maximum DC Power (Module STC) Inverter / Synergy Unit | 140000 / 70000 | 175000 / 58300 | 210000 / 70000 | | W |
| Transformer-less, Ungrounded | Yes | | | | |
| Maximum Input Voltage DC+ to DC- | 1000 | | | | Vdc |
| Operating Voltage Range | 850 – 1000 | | | | Vdc |
| Maximum Input Current | 2 x 48.25 | 3 x 40 | 3 x 48.25 | | Adc |
| Reverse-Polarity Protection | Yes | | | | |
| Ground-Fault Isolation Detection | 167kΩ sensitivity per Synergy Unit ⁽²⁾ | | | | |
| CEC Weighted Efficiency | 98.5 | | | | % |
| Nighttime Power Consumption | < 8 | < 12 | | | W |
| ADDITIONAL FEATURES | | | | | |
| Supported Communication Interfaces ⁽³⁾ | 2 x RS485, Ethernet, Wi-Fi (optional), Cellular (optional) | | | | |
| Smart Energy Management | Export Limitation | | | | |
| Inverter Commissioning | With the SetApp mobile application using built-in Wi-Fi access point for local connection | | | | |
| Arc Fault Protection | Built-in, User Configurable (According to UL1699B) | | | | |
| Photovoltaic Rapid Shutdown System | EC 2014, 2017 and 2020, Built-in | | | | |
| PID Rectifier | Nighttime, built-in | | | | |
| RS485 Surge Protection (ports 1+2) | Type II, field replaceable, integrated | | | | |
| AC, DC Surge Protection | Type II, field replaceable, integrated | | | | |
| DC Fuses (Single Pole) | 25A, integrated | | | | |
| DC SAFETY SWITCH | | | | | |
| DC Disconnect | Built-in | | | | |
| STANDARD COMPLIANCE | | | | | |
| Safety | UL1699B, UL1741, UL1741 SA, UL1741 SB, UL1998, CSA C22.2#107.1, Canadian AFCI according to T.I.L. M-07 | | | | |
| Grid Connection Standards | IEEE 1547-2018, Rule 21, Rule 14 (HI) | | | | |
| Emissions | FCC part 15 class A | | | | |

(1) For other regional settings please contact SolarEdge support.

(2) Where permitted by local regulations.

(3) For specifications of the optional communication options, visit the [Communication product page](#) or the [Resource Library](#) to download the relevant product datasheet.

/ Three Phase Inverter with Synergy Technology

For the 277/480V Grid for North America

SE80KUS / SE100KUS / SE110KUS / SE120KUS

| MODEL NUMBER | SE80KUS | SE100KUS | SE110KUS | SE120KUS |
|--|---|---|----------|----------|
| APPLICABLE TO INVERTERS WITH PART NUMBER | SExxK-USx8Lxxxx | | | UNITS |
| INSTALLATION SPECIFICATIONS | | | | |
| Number of Synergy Units per Inverter | 2 | 3 | | |
| Ac Max Conduit Size | 2 1/2" | | | in |
| Max AWG Line / PE | 4/0 / 1/0 | | | |
| DC Max Conduit Size | 1 x 3"; 2 x 2" | | | in |
| DC Input Inverter/ Synergy Unit | 8 / 4 pairs; 6-12 AWG | 12 / 4 pairs; 6-12 AWG | | |
| | 2 pairs / 1 pair, Max 2 AWG; copper or aluminum | 3 pairs / 1 pair, Max 2 AWG; copper or aluminum | | |
| Dimensions (H x W x D) | Synergy Unit: 22 x 12.9 x 10.75 / 558 x 328 x 273 Synergy Manager: 14.17 x 22.4 x 11.6 / 360 x 560 x 295 | | | in / mm |
| Weight | Synergy Unit: 70.4 / 32 Synergy Manager: 39.6 / 18 | | | lb / kg |
| Operating Temperature Range | -40 to +140 / -40 to +60 ⁽⁴⁾ | | | °F / °C |
| Cooling | Fan (user replaceable) | | | |
| Noise | < 67 | | | dBA |
| Protection Rating | NEMA 3R | | | |
| Mounting | Brackets provided | | | |

(4) For power de-rating information refer to the [Temperature De-rating - Technical Note \(North America\)](#).

DRY TYPE TRANSFORMER SPECIFICATION

TRANSFORMER SPECIFICATION

| | |
|------------------|--------|
| RATING | 500kVA |
| COOLING | ANN |
| TEMPERATURE RISE | 115°C |
| PHASES | 3 |
| FREQUENCY | 60Hz |
| K-FACTOR | 4 |

| | PRIMARY | SECONDARY |
|-------------|----------|-----------|
| VOLTAGE | 600V | 480Y/277V |
| TAPS - FCAN | 2 x 2.5% | - |
| TAPS - FCBN | 2 x 2.5% | - |
| BIL | 10kV | 10kV |

| | |
|----------------------|-------------------------|
| CONDUCTOR | ALUMINUM |
| WINDINGS | POLYESTER RESIN DIPPED |
| INSULATION CLASS | 220°C |
| IMPEDANCE (@ 135°C) | 4.0% - 6.0% |
| MIN EFFICIENCY | 99.14% @ 35% LOAD, 75°C |
| AVG. SOUND LEVEL | 60dBA |
| ELECTROSTATIC SHIELD | NONE |
| EST. WEIGHT | 3860 lbs [1755kg] |

TERMINALS AND CABLE LUGS

| | PRIMARY | SECONDARY |
|-----------------|-------------------------------------|-----------|
| LOCATION | FRONT | REAR |
| LINE LUGS (/PH) | PADS | PADS |
| NEUTRAL LUGS | N/A | PADS |
| GROUND LUG | 300 MCM-6 AWG LUG ON ENCLOSURE BASE | |

WIRING / CONNECTIONS

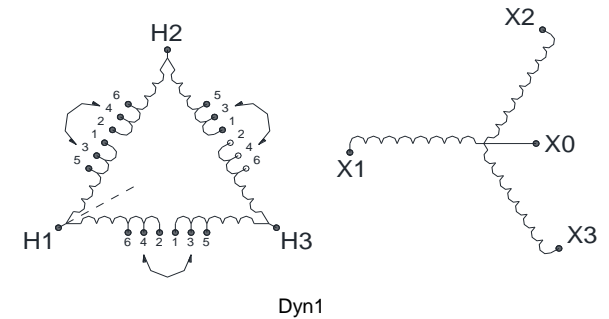
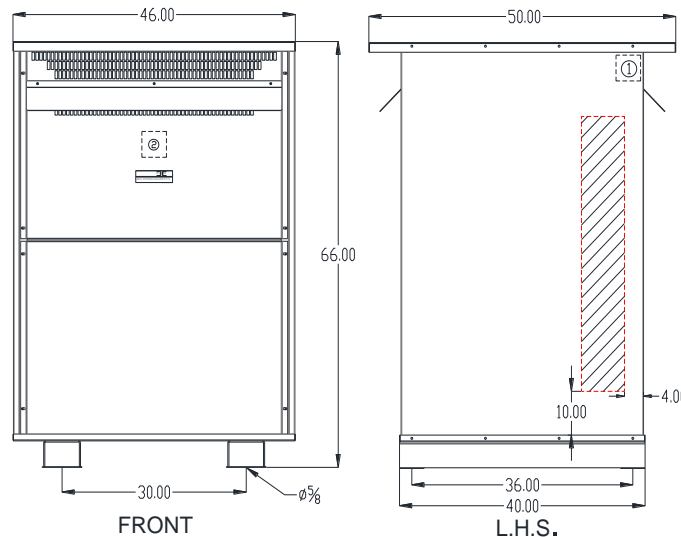
| PRIMARY: H1-H2-H3 | | |
|-------------------|--------|--------|
| VOLTAGE | % TAP | LINKS: |
| 630 | 105.0% | 1-2 |
| 615 | 102.5% | 2-3 |
| 600 | 100.0% | 3-4 |
| 585 | 97.5% | 4-5 |
| 570 | 95.0% | 5-6 |

| SECONDARY: X0-X1-X2-X3 | | |
|------------------------|-------|----------------------------|
| VOLTAGE | PHASE | CONNECT LOAD TO |
| 480 | 3 | X1-X2-X3 |
| 277 | 1 | X0-X1, X0-X2, AND/OR X0-X3 |

FEATURES

- NEOPRENE ANTI-VIBRATION PADS INSTALLED BETWEEN CORE & COIL AND ENCLOSURE BASE
- LUG FOR EARTH GROUNDING PROVIDED
- SUITABLE FOR NON-SINUSOIDAL CURRENT LOAD WITH K-FACTOR NOT TO EXCEED 4
- NEUTRAL SIZED FOR 200% OF LINE CURRENT
- SEISMIC RATED FOR USA ZONE 4 AND CANADA ZONE 6
- CSA CERTIFIED (FILE # LR34493)
- UL LISTED (FILE # E108255)
- ISO 9001 QUALITY MANAGEMENT SYSTEM
- EFFICIENCY MEETS OR EXCEEDS:
 - CANADA: SOR/DORS/2018-201 (NRCAN 2019)
 - CSA: CSA C802.2-18
 - USA: DOE 10 CFR PART 431:2016-01 (DOE 2016)

1) Location of nameplate and labels for Canada
 2) Location of nameplate and labels for USA
 *Recommended area for side cable entry (7"x50") on either side



ENCLOSURE

| | |
|------------------|-----------------------|
| ENCLOSURE PART # | E3R-10 |
| ENCLOSURE RATING | TYPE 3R (INDOOR)* |
| CONSTRUCTION | VENTILATED |
| MATERIAL | STEEL |
| FINISH | POLYESTER POWDER COAT |
| COLOR | ANSI/ASA 61 (GREY) |
| MOUNTING | FLOOR |

*SPRINKLERPROOF WHEN THE ANGLE BETWEEN SPRINKLER HEADS AND OPENING IN THE ENCLOSURE DOES NOT EXCEED 45 DEGREE FROM THE VERTICAL.

*FOR PROPER VENTILATION FOR FLOOR INSTALLATION KEEP AT LEAST 6 INCHES FROM ADJACENT WALLS

| REV | REMARKS | BY | DATE | PRELIMINARY DRAWING | PRODUCT | K-FACTOR RATED ISOLATION TRANSFORMER |
|-----|---------|----|------|---|-----------------|--------------------------------------|
| | | | | THIS DRAWING MAY NOT TRULY REFLECT OUR FINAL DESIGN. ANY ORDER(S) MUST BE ACCOMPANIED BY OR REFER TO THIS DRAWING. REX POWER MAGNETICS RESERVES THE RIGHT TO CHANGE OR REVISE THESE SPECIFICATIONS WITHOUT NOTICE | MODEL / CAT No. | BA500J-P/K4/T115/Z3 |
| | | | | | CUSTOMER | - |
| | | | | | PO # | - |
| | | | | | SWO # | - QTY - |
| | | | | | Prepared By | C.G. Date 9/21/2020 |
| | | | | | Approved By | Date - |



Heavy Duty Safety Switches

Selection



| System | Ampere Rating | Indoor — Type 1 | | Outdoor — Type 3R | | Horsepower Rating [Ⓞ] | | | | | | | | 250 Volt DC | 600 Volt DC |
|--------|---------------|-----------------|--------------------------|-------------------|--------------------------|--------------------------------|-----------------|-----------------|-----------------|-------------|-------------|--|--|-------------|-------------|
| | | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480V AC | | 600V AC | | 250 Volt DC | 600 Volt DC | | | | |
| | | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | | | | | | |

600 Volt Fusible[Ⓢ]

2-Pole, 2-Fuse[Ⓢ]

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/600 Volt DC | | | | | | | | | |
|---------------|----------------|--------------------------|----------------|--------------------------|-------------------------------------|-----------------|-----------------|-----------------|-------------|-------------|---|---|----|----|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 250 Volt DC | 600 Volt DC | | | | |
| 30 | HF261 | 15 | HF261R | 15 | 3 | 7½ | — | — | 3 | 10 | — | — | 5 | 15 |
| 60 | HF262 | 20 | HF262R | 20 | 5 | 20 | — | — | 10 | 25 | — | — | 10 | 30 |
| 100 | HF263 | 26 | HF263R | 27 | 10 | 30 | — | — | 15 | 40 | — | — | 20 | 50 |

3-Pole, 3-Fuse

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|---------------|---------------------|--------------------------|----------------------|--------------------------|--|-----------------|-----------------|-----------------|-------------|-------------|-----|-----|----|-----------------|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 250 Volt DC | 600 Volt DC | | | | |
| 30 | HF361 | 14 | HF361R | 15 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| 30 | HF361L [Ⓢ] | 19 | HF361RL [Ⓢ] | 20 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| 60 | HF362 | 19 | HF362R | 20 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| 60 | — | — | HF362RL [Ⓢ] | 25 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| 100 | HF363 | 24 | HF363R | 25 | 5 | 20 | 25 | 60 | 15 | 40 | 30 | 75 | 20 | 50 [Ⓢ] |
| 200 | HF364 | 48 | HF364R | 49 | 25 | 50 | 50 | 125 | 30 | 50 | 60 | 150 | 40 | 50 |
| 400 | HF365A [Ⓢ] | 93 | HF365RA [Ⓢ] | 157 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 600 | HF366A [Ⓢ] | 98 | HF366RA [Ⓢ] | 161 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 800 | HF367 | 365 | HF367R | 365 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — |
| 1200 | HF368 | 383 | HF368R | 385 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — |

3-Pole, 3-Fuse and Solid Neutral

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|---------------|----------------|--------------------------|----------------|--------------------------|--|-----------------|-----------------|-----------------|-------------|-------------|-----|-----|----|-----------------|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 250 Volt DC | 600 Volt DC | | | | |
| 30 | HF361N | 14 | HF361NR | 15 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| 60 | HF362N | 19 | HF362NR | 20 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| 100 | HF363N | 25 | HF363NR | 26 | 10 | 30 | 25 | 60 | 15 | 40 | 30 | 75 | 20 | 50 [Ⓢ] |
| 200 | HF364N | 49 | HF364NR | 50 | 25 | 50 | 50 | 125 | 30 | 50 | 60 | 150 | 40 | 50 |
| 400 | HF365NA | 94.6 | HF365NRA | 94.6 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 600 | HF366NA | 99.6 | HF366NRA | 99.6 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 800 | HF367N | 375 | HF367NR | 375 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |
| 1200 | HF368N | 395 | HF368NR | 388 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |

600 Volt Fusible[Ⓢ] (For 2-Pole Applications use outside poles of 3-Pole Switches)

2-Pole, 2-Fuse[Ⓢ]

| Ampere Rating | Type 4/4X Stainless [Ⓢ] | | Type 12 Industrial [Ⓢ] | | 480 Volt AC/600 Volt AC/600 Volt DC | | | | | | | | | |
|---------------|----------------------------------|--------------------------|---------------------------------|--------------------------|-------------------------------------|-----------------|-----------------|-----------------|-------------|-------------|---|---|----|----|
| | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 250 Volt DC | 600 Volt DC | | | | |
| 30 | HF261S | 15 | HF261J■ | 15 | 3 | 7½ | — | — | 3 | 10 | — | — | 5 | 15 |
| 60 | HF262S | 20 | HF262J■ | 20 | 5 | 20 | — | — | 10 | 25 | — | — | 10 | 30 |
| 100 | HF263S■ | 27 | HF263J■ | 27 | 10 | 30 | — | — | 15 | 40 | — | — | 20 | 50 |

3-Pole, 3-Fuse

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|---------------|----------------------|--------------------------|----------------------|--------------------------|--|-----------------|-----------------|-----------------|-------------|-------------|-----|-----|----|-----------------|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 250 Volt DC | 600 Volt DC | | | | |
| 30 | HF361S | 13 | HF361J | 14 | — | — | 5 | 15 | — | — | 7½ | 20 | 5 | — |
| 60 | HF362S | 20 | HF362J | 20 | — | — | 15 | 30 | — | — | 15 | 50 | 10 | 30 [Ⓢ] |
| 100 | HF363S | 25 | HF363J | 25 | — | — | 25 | 60 | — | — | 30 | 75 | 20 | 50 [Ⓢ] |
| 200 | HF364S | 49 | HF364J | 49 | — | — | 50 | 125 | — | — | 60 | 150 | 40 | 50 |
| 400 | HF365SA [Ⓢ] | 93 | HF365JA [Ⓢ] | 93 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 400 | HF365SSA | 93 | — | — | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 600 | HF366SA [Ⓢ] | 98 | HF366JA [Ⓢ] | 98 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 600 | HF366SSA | 98 | — | — | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 800 | HF367S | 370 | HF367J■ | 365 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — |
| 1200 | HF368S■ | 388 | HF368J■ | 388 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |

■ Built to order. Allow 3-5 weeks for delivery.

Ⓢ 60-600A 3-Pole switches are also rated 600V DC.

Ⓢ Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

Ⓢ Use 3-Pole switch for 200A applications.

Ⓢ Dual horsepower ratings: Std.- applies when non-time delay fuses are installed. Max.- applies when time-delay fuses are installed.

Ⓢ Suitable for use as service entrance equipment except on 1200 Amp solidly grounded wye systems per NEC 230.95.

Ⓢ Also rated Type 3S/3R.

Ⓢ Indicates oversized enclosure (30A switch with 60A lugs in a 60A enclosure or 60A switch with 100A lugs in a 100A enclosure).

Ⓢ 600V DC & 600V DC horsepower rating shown requires (2) poles to be connected in series.

Ⓢ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 4-18.

General and Heavy Duty Safety Switches

Dimensions

Safety Switch Dimensions (Inches)* & Shipping Weights

| Catalog Number | Height | | | Width | | Depth | | Knockout Diagram ^① | Shipping Weight (lbs.) |
|--|--------|-------------|------------------|-------|---------------|-------|---------------|-------------------------------|------------------------|
| | Box A | With Door B | With Rain Shed C | Box D | With Handle E | Box F | With Handle G | | |
| HF362J, JW | 16.27 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 20 |
| HF362N | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 19 |
| HF362NR | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 20 |
| HF362R, RPV, RPVPG, RW | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 20 |
| HF362RL | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 25 |
| HF362S, SS, SSW, SW | 16.27 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 20 |
| HF363, PV, PVPG | 21.95 | 23.15 | — | 9.64 | 12.01 | 5.05 | 10.17 | S10 | 24 |
| HF363J, JW | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 25 |
| HF363N | 21.95 | 23.15 | — | 9.64 | 12.01 | 5.05 | 10.17 | S10 | 25 |
| HF363NR | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 26 |
| HF363R, RPV, RPVPG | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 25 |
| HF363S, SS, SSW, SW | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 25 |
| HF364, PV, PVPG | 29.9 | 31.07 | — | 14.62 | 16.98 | 6.36 | 12.33 | S12 | 48 |
| HF364J, JW | 29.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 49 |
| HF364N | 29.9 | 31.07 | — | 14.62 | 16.98 | 6.36 | 12.33 | S12 | 49 |
| HF364NR | 29.9 | — | 31.42 | 14.61 | 16.99 | 6.36 | 12.33 | S13 | 48 |
| HF364R, RPV, RPVPG | 29.9 | — | 31.42 | 14.61 | 16.99 | 6.36 | 12.33 | S13 | 49 |
| HF364S, SS, SSW, SW | 29.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 49 |
| HF365A | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 93 |
| HF365JA, HF365JWA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 93 |
| HF365NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 94.6 |
| HF365NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 94.6 |
| HF365RA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 93 |
| HF365SA, HF365SWA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF365SSA, HF365SSWA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF366A | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 98 |
| HF366JA, HF366JWA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 98 |
| HF366NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 99.6 |
| HF366NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 99.6 |
| HF366RA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 98 |
| HF366SA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF366SSA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF367 | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 380 |
| HF367J | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 380 |
| HF367N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 382 |
| HF367NR | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 386 |
| HF367R | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 382 |
| HF367S | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 380 |
| HF368, J, S | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 383 |
| HF368N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 385 |
| HF368NR | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 388 |
| HF368R | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 385 |
| HNF365JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 75 |
| HNF365RA | 33.47 | 33.96 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 75 |
| HNF365SA | 33.47 | 33.96 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 75 |
| HNF365SSA | 33.47 | 33.96 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 75 |
| HNF366SA | 33.47 | 33.96 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 77 |
| HNF366SSA | 33.47 | 33.96 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 77 |
| HNF366JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 77 |
| HNF366RA | 33.47 | 33.96 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 77 |
| HNF361, PV, PVPG also HNF261 & HNF362H | 11.11 | 12.31 | — | 6.64 | 9.01 | 5.05 | 10.17 | S7 | 12 |
| HNF361J, JW also HNF261J & HNF362JH | 11.12 | 14.14 | — | 6.65 | 9.02 | 5.56 | 10.46 | — | 13 |
| HNF361R, RPV, RPVPG also HNF261R & HNF362RH | 11.11 | — | 12.63 | 6.64 | 9.01 | 5.05 | 10.17 | S9 | 13 |
| HNF361RL | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 20 |
| HNF361S, SS, SSW, SW also HNF261S & HNF362SH | 11.12 | 14.14 | — | 6.65 | 9.02 | 5.56 | 10.46 | — | 13 |
| HNF362, PV, PVPG also HNF262 | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 18 |
| HNF362J, JW also HNF262J | 16.27 | 17.46 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 19 |
| HNF362R, RPV, RPVPG also HNF262R | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 19 |
| HNF362RL | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 24 |
| HNF362S, SS, SSW, SW also HNF262S | 16.27 | 17.46 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 19 |
| HNF363, PV, PVPG also HNF263 | 21.95 | 23.15 | — | 9.64 | 12.01 | 5.05 | 10.17 | S10 | 23 |
| HNF363J, JW also HNF263J | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 24 |
| HNF363R, RPV, RPVPG also HNF263R | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 24 |
| HNF363S, SS, SSW, SW also HNF263S | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 24 |

*For inches / millimeters conversion, multiply inches by 25.4.

① Knocks not provided on Type 4 / 4X and 12 or in 800 & 1200A switches.

Application

Type P4 Panelboards

Table P4-3 – Main Breaker Selection

| Ampere rating | Breaker type | | | Maximum IC (KA) Symmetrical Amperes | | | Main Breaker Unit Space in inches (mm) | Continuous Current Rating |
|---------------|------------------------|-----------------|----------------|-------------------------------------|------------|--------------------|--|-----------------------------------|
| | Trip type ¹ | Frame type | Breaker family | 240V | 480V | 600V | | |
| | | | | | | | | |
| 400A | TMTU | JXD6, JD6 | Sentron | 65 | 35 | 22 | 8.75 (222) | 200, 225, 250, 300, 350, 400 |
| | | HJXD6, HJD6 | Sentron | 100 | 65 | 35 | 8.75 (222) | 200, 225, 250, 300, 350, 400 |
| | | HHJXD6, HHJD6 | Sentron | 200 | 100 | 50 | 8.75 (222) | 200, 225, 250, 300, 350, 400 |
| | | CJD6 | Sentron | 200 | 150 | 100 | 8.75 (222) | 200, 225, 250, 300, 350, 400 |
| | ETU | NJ | VL | 65 | 35 | 25 | 6.25 (159) | 250, 400 |
| | | SJD6 | Sentron | 65 | 35 | 25 | 8.75 (222) | 200, 300, 400 |
| | | HJ | VL | 100 | 65 | 25 | 6.25 (159) | 250, 400 |
| | | SHJD6 | Sentron | 100 | 65 | 35 | 8.75 (222) | 200, 300, 400 |
| | | LJ | VL | 200 | 100 | 25 | 6.25 (159) | 250, 400 |
| | | SCJD6 | Sentron | 200 | 150 | 100 | 8.75 (222) | 200, 300, 400 |
| 600A | TMTU | LXD6 | Sentron | 65 | 35 | 25 | 8.75 (222) | 450, 500, 600 |
| | | LD6 | Sentron | 65 | 35 | 25 | 8.75 (222) | 250, 300, 350, 400, 450, 500, 600 |
| | | HLXD6, HLD6 | Sentron | 100 | 65 | 35 | 8.75 (222) | 250, 300, 350, 400, 450, 500, 600 |
| | | HHLXD6, HHL6 | Sentron | 200 | 100 | 50 | 8.75 (222) | 250, 300, 350, 400, 450, 500, 600 |
| | | CLD6 | Sentron | 200 | 150 | 100 | 8.75 (222) | 250, 300, 350, 400, 450, 500, 600 |
| | ETU | NL ² | VL | 65 | 35 | 18 | 6.25 (159) | 400, 600 |
| | | SLD6 | Sentron | 65 | 35 | 25 | 8.75 (222) | 300, 400, 500, 600 |
| | | HL ² | VL | 100 | 65 | 18 | 6.25 (159) | 400, 600 |
| | | SHLD6 | Sentron | 100 | 65 | 35 | 8.75 (222) | 300, 400, 500, 600 |
| | | LL ² | VL | 200 | 100 | 18 | 6.25 (159) | 400, 600 |
| SCLD6 | Sentron | 200 | 150 | 100 | 8.75 (222) | 300, 400, 500, 600 | | |
| 800A | TMTU | NM ³ | VL | 65 | 35 | 25 | 8.75 (222) | 600, 700, 800 |
| | | HM ³ | VL | 100 | 65 | 35 | 8.75 (222) | 600, 700, 800 |
| | | LM ³ | VL | 200 | 100 | 50 | 8.75 (222) | 600, 700, 800 |
| | ETU | NM ³ | VL | 65 | 35 | 25 | 8.75 (222) | 600, 800 |
| | | HM ³ | VL | 100 | 65 | 35 | 8.75 (222) | 600, 800 |
| | | LM ³ | VL | 200 | 100 | 50 | 8.75 (222) | 600, 800 |

¹ TMTU = Thermal Magnetic Trip Unit and ETU = Electronic Trip Unit.

² 100% ratings are not available for the VL LG frame, replace with VL MG frame @ 600A rated 100%.

³ 100% ratings are not available for the VL MG. Use a P5 panel for this application with the VL NG frame @ 800A rated 100%.

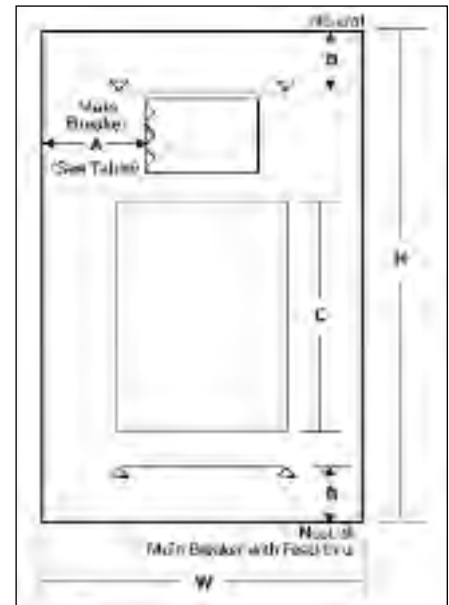
Table P4-4 – Enclosure Selection ¹

| Enclosure Dimension in Inches (mm) | | | Available Unit Space in Inches (mm) Dimension "C" in Fig. 4-1 | | |
|------------------------------------|----------|----------|---|--------------|--------------|
| H | W | D | Main Lug Only | Main Breaker | 800A |
| | | | 400 / 800A | 400A/600A | |
| 60 (1524) | 32 (813) | 10 (254) | 30 (762) | 23.75 (603) | 21.25 (540) |
| 75 (1905) | 32 (813) | 10 (254) | 45 (1143) | 38.75 (984) | 26.25 (921) |
| 90 (2286) | 32 (813) | 10 (254) | 60 (1524) | 53.75 (1365) | 51.25 (1302) |

¹ Standard trim is four piece without door. Surface or flush one piece trim is available for 32 in. (813 mm) wide circuit breaker panels.

Table P4-5 – Main Breaker Lug Location Reference (Fig. P4-1)

| Ampere Rating | Breaker Type | Dimensions in Inches (mm) | |
|---------------|--------------------------------------|---------------------------|--------------|
| | | A | B |
| 400 | JXD6, JD6, HJXD6, HJD6 | 10.425 (265) | 13.125 (333) |
| 400 | HHJXD6, HHJD6 | | |
| 400 | NJ, HJ, LJ | | |
| 400 | SJD6, SHJD6 | | |
| 400 | CJD6, SCJD6 | | |
| 600 | LXD6, LD6, HLXD6, HLD6, HHLXD6, HHL6 | | |
| 600 | NL, HL, LL | | |
| 600 | SLD6, SHLD6 | | |
| 600 | CLD6, SCLD6 | | |
| 800 | NM, HM, LM, | | |

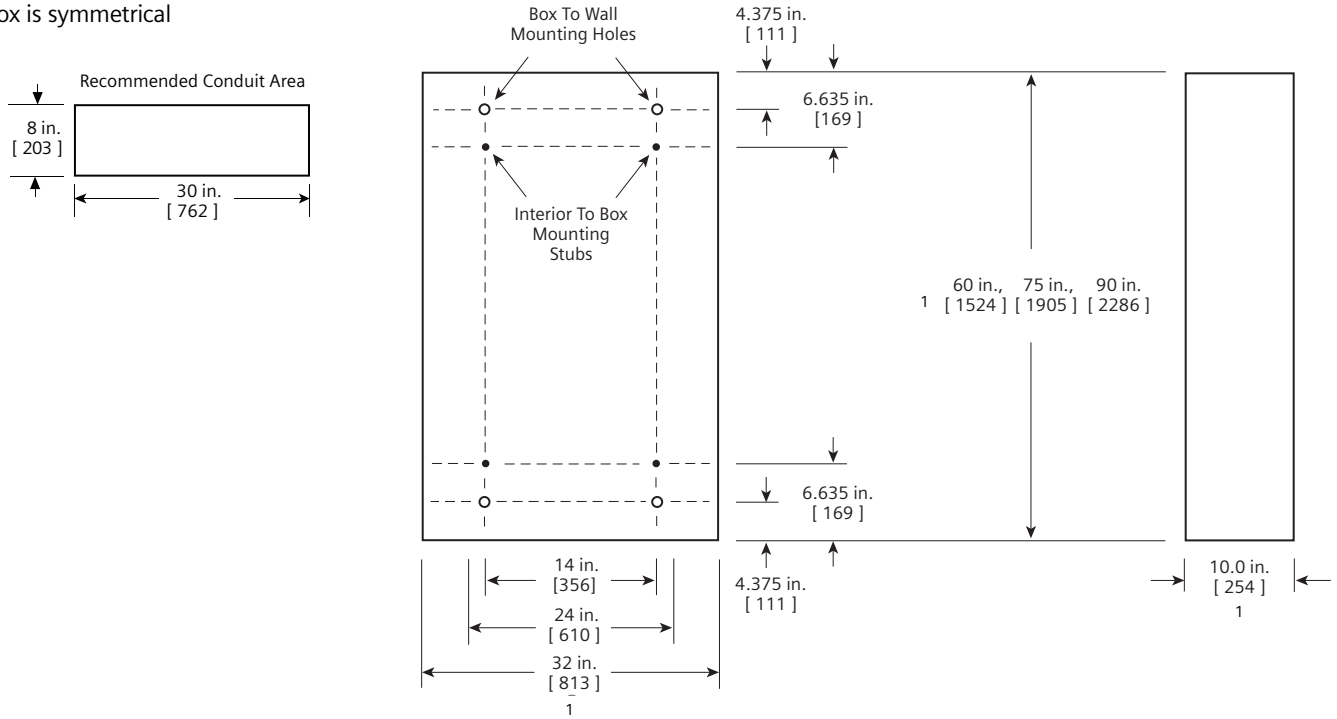
Fig. P4-1


Dimensions

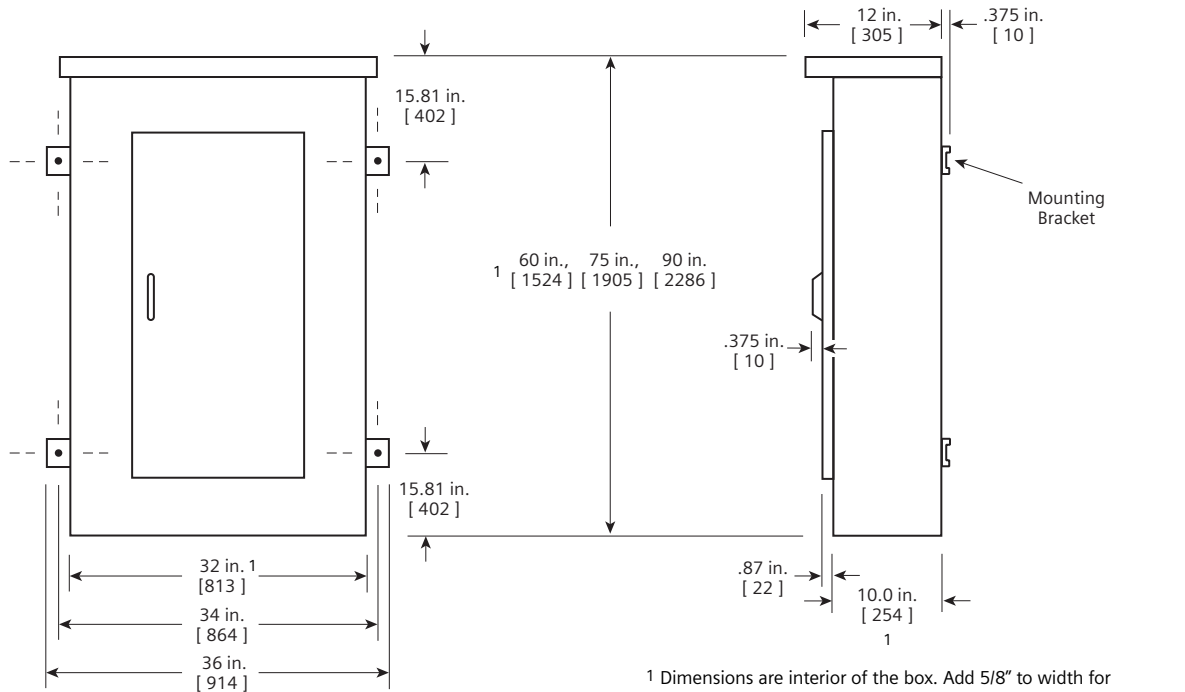
Type P4 Panelboards

Type 1 Box

Box is symmetrical



Type 3R and 3R/12 Box



¹ Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.

Dimensions shown in inches and millimeters [].

CASE STUDY

500KW SYSTEM ON RESIDENTIAL BUILDING

BUILDING TYPE:

Residential building with 1800 panels of 360W (total 648 kW DC)

SYSTEM SIZE:

5 x 33.3kW SMA Core1

SYSTEM LAYOUT:

180 strings of 10 panels with five building penetration holes (Conduit size 4")

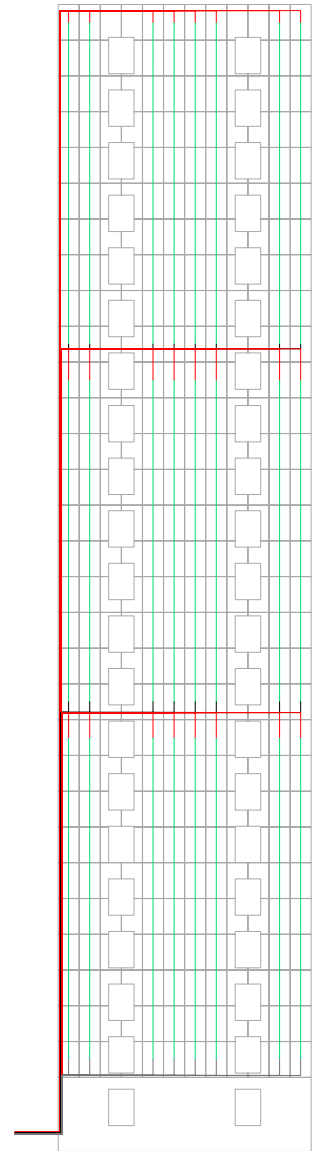
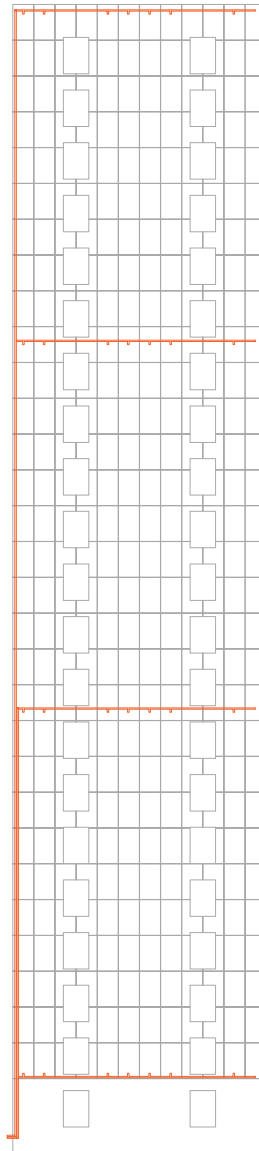
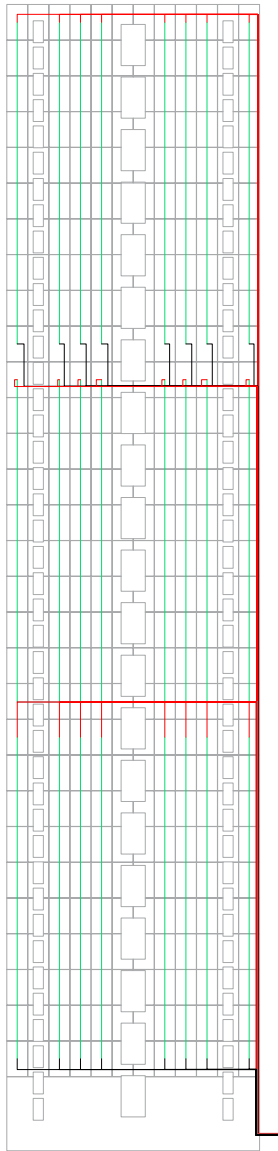
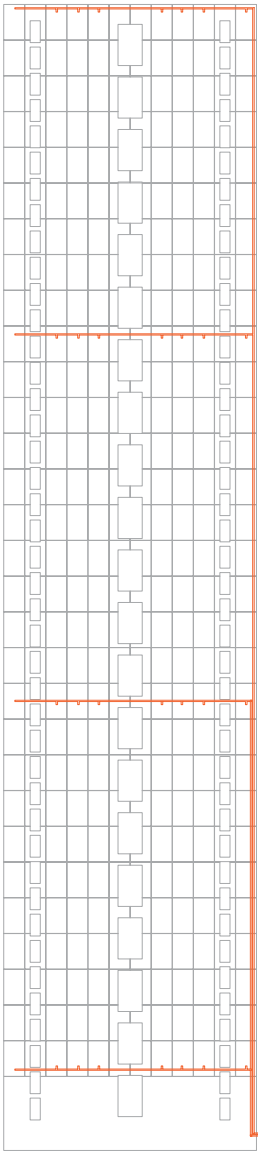
PROJECT SOLAR EQUIPMENT:

One AC Panelboard 800A 600V, One 500kVA transformer 480V/600V, two 600A 600V disconnect switches (One could be replaced with breaker inside the main building switchboard if available)

500kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING BASEMENT

EAST ELEVATION

WEST ELEVATION

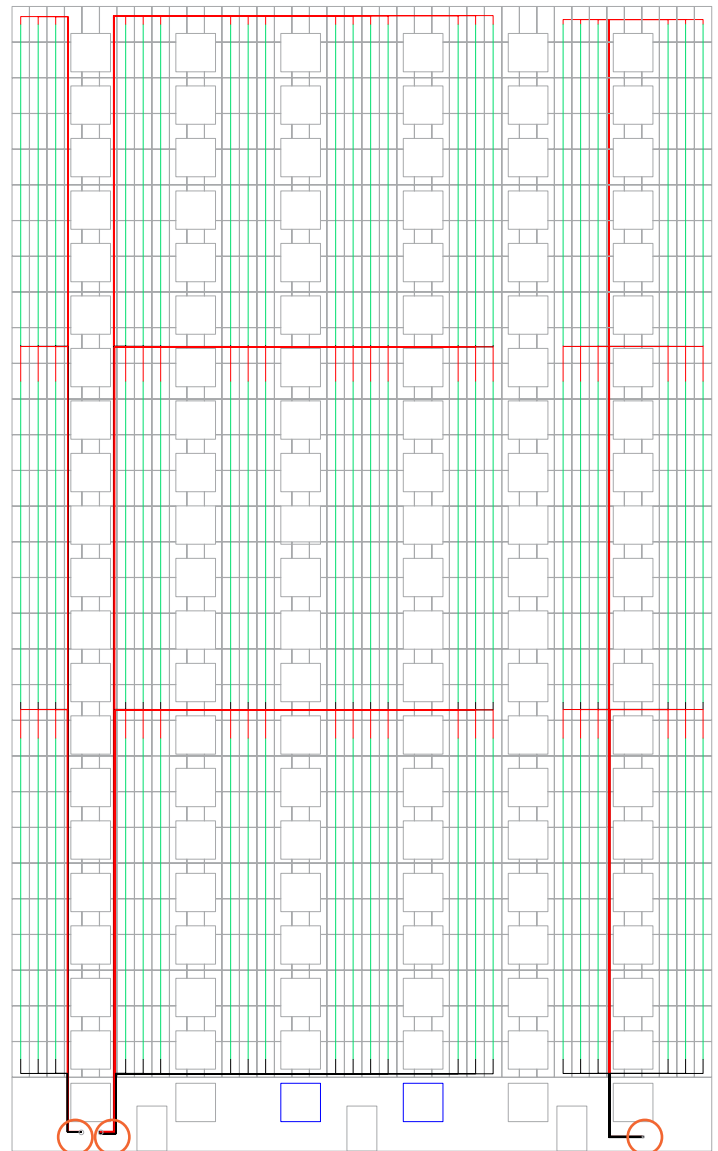
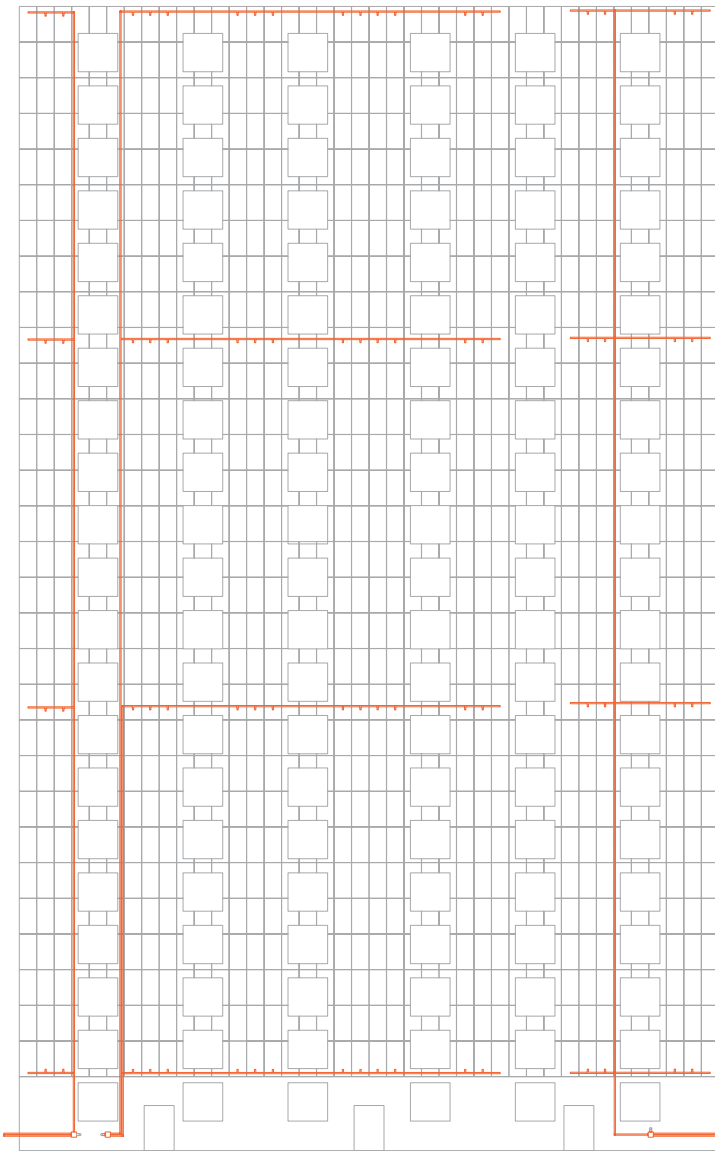


LINE COLOUR REFERENCE

- Building & solar panels layout
- Conduit layout
- Electrical strings
- Home run wiring

500kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING BASEMENT

SOUTH ELEVATION



- LINE COLOUR REFERENCE
- Building & solar panels layout
 - Conduit layout
 - Electrical strings
 - Home run wiring

BUILDING PENETRATION FOR CONDUIT TO INVERTER

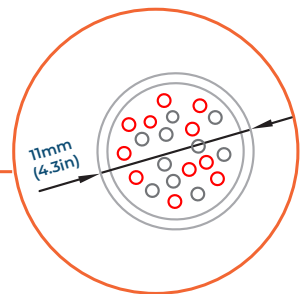
500kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING BASEMENT

SOUTH ELEVATION



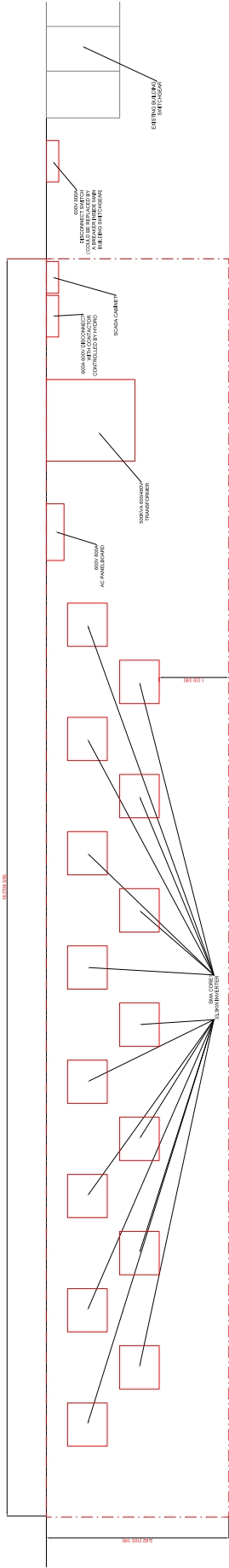
- LINE COLOUR REFERENCE
- Building & solar panels layout
 - Conduit layout
 - Electrical strings
 - Home run wiring

BUILDING PENETRATION FOR CONDUIT TO INVERTER



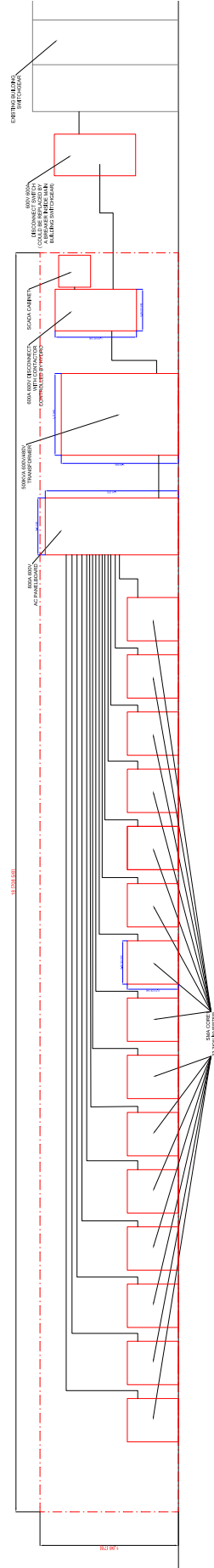
500kW SYSTEM WIRING LAYOUT: HOME RUN TO THE BUILDING BASEMENT

TOP VIEW



Note: Working area is 1m (39.37in) in front of solar equipments as per electrical code.

FRONT VIEW





SUNNY TRIPOWER CORE1 33-US / 50-US / 62-US

STP 33-US-41 / STP 50-US-41 / STP 62-US-41

**UP TO 60% FASTER
INSTALLATION FOR
COMMERCIAL PV SYSTEMS**



Fully integrated

- Innovative design requires no additional racking for rooftop installation
- Integrated DC and AC disconnects and overvoltage protection
- 12 direct string inputs for reduced labor and material costs

Increased power, flexibility

- Multiple power ratings for small to large scale commercial PV installations
- Six MPP trackers for flexible stringing and maximum power production
- ShadeFix, SMA's proprietary shade management solution, optimizes at the string level

Enhanced safety, reliability

- Integrated SunSpec PLC signal for module-level rapid shutdown compliance to 2017 NEC
- Next-gen DC AFCI arc-fault protection certified to new Standard UL 1699B Ed. 1

Smart monitoring, control, service

- Advanced smart inverter grid support capabilities
- Increased ROI with SMA ennexOS cross sector energy management platform
- SMA Smart Connected proactive O&M solution reduces time spent diagnosing and servicing in the field

SUNNY TRIPOWER CORE1 33-US / 50-US / 62-US

It stands on its own

The Sunny Tripower CORE1 is the world's first free-standing PV inverter for commercial rooftops, carports, ground mount and repowering legacy solar projects. From distribution to construction to operation, the Sunny Tripower CORE1 enables logistical, material, labor and service cost reductions, and is the most versatile, cost-effective commercial solution available. Integrated SunSpec PLC for rapid shutdown and enhanced DC AFCI arc-fault protection ensure compliance to the latest safety codes and standards. With Sunny Tripower CORE1 and SMA's ennexOS cross sector energy management platform, system integrators can deliver comprehensive commercial energy solutions for increased ROI.

| Technical data | Sunny Tripower CORE1 33-US | Sunny Tripower CORE1 50-US | Sunny Tripower CORE1 62-US |
|--|--|----------------------------|----------------------------|
| Input (DC) | | | |
| Maximum array power | 50000 Wp STC | 75000 Wp STC | 93750 Wp STC |
| Maximum system voltage | 1000 V | | |
| Rated MPP voltage range | 330 V... 800 V | 500 V... 800 V | 550 V... 800 V |
| MPPT operating voltage range | 150 V... 1000 V | | |
| Minimum DC voltage / start voltage | 150 V / 188 V | | |
| MPP trackers / strings per MPP input | 6/2 | | |
| Maximum operating input current / per MPP tracker | 120 A / 20 A | | |
| Maximum short circuit current per MPPT / per string input | 30 A / 30 A | | |
| Output (AC) | | | |
| AC nominal power | 33300 W | 50000 W | 62500 W |
| Maximum apparent power | 33300 VA | 53000 VA | 66000 VA |
| Output phases / line connections | 3 / 3-(N)-PE | | |
| Nominal AC voltage | 480 V / 277 V WYE | | |
| AC voltage range | 244 V... 305 V | | |
| Maximum output current | 40 A | 64 A | 80 A |
| Rated grid frequency | 60 Hz | | |
| Grid frequency / range | 50 Hz, 60 Hz / -6 Hz... +6Hz | | |
| Power factor at rated power / adjustable displacement | 1 / 0.0 leading... 0.0 lagging | | |
| Harmonics THD | <3% | | |
| Efficiency | | | |
| CEC efficiency | 97.5% | 97.5% | 97.5% |
| Protection and safety features | | | |
| Load rated DC disconnect | ● | | |
| Load rated AC disconnect | ● | | |
| Ground fault monitoring: Riso / Differential current | ●/● | | |
| DC AFCI arc-fault protection | ● | | |
| SunSpec PLC signal for rapid shutdown | ● | | |
| DC reverse polarity protection | ● | | |
| AC short circuit protection | ● | | |
| DC surge protection: Type 2 / Type 1+2 | ○/○ | | |
| AC surge protection: Type 2 / Type 1+2 | ○/○ | | |
| Protection class / overvoltage category (as per UL 840) | I/IV | | |
| General data | | | |
| Device dimensions (W/H/D) | 621 mm / 733 mm / 569 mm (24.4 in x 28.8 in x 22.4 in) | | |
| Device weight | 84 kg (185 lbs) | | |
| Operating temperature range | -25 °C... +60 °C (-13 °F... +140 °F) | | |
| Storage temperature range | -40 °C... +70 °C (-40 °F... +158 °F) | | |
| Audible noise emissions (full power @ 1m and 25 °C) | 65 dB(A) | | |
| Internal consumption at night | 5 W | | |
| Topology | Transformerless | | |
| Cooling concept | OptiCool (forced convection, variable speed fans) | | |
| Enclosure protection rating | Type 4X, 3SX (as per UL 50E) | | |
| Maximum permissible relative humidity (non-condensing) | 100% | | |
| Additional information | | | |
| Mounting | Free-standing with included mounting feet | | |
| DC connection | Amphenol UTX PV connectors | | |
| AC connection | Screw terminals - 4 AWG to 4/0 AWG CU/AL | | |
| LED indicators (Status / Fault / Communication) | ● | | |
| Network interfaces: Ethernet / WLAN / RS485 | ● (2 ports) / ● / ○ | | |
| Data protocols: SMA Modbus / SunSpec Modbus / Webconnect | ● / ● / ● | | |
| Multifunction relay | ● | | |
| ShadeFix technology for string level optimization | ● | | |
| Integrated Plant Control / Q on Demand 24/7 | ● / ● | | |
| Off-Grid capable / SMA Fuel Save Controller compatible | ● / ● | | |
| SMA Smart Connected (proactive monitoring and service support) | ● | | |
| Certifications | | | |
| Certifications and approvals | UL 1741, UL 1699B Ed. 1, UL 1998, CSA 22.2 107-1, PV Rapid Shutdown System Equipment | | |
| FCC compliance | FCC Part 15 Class A | | |
| Grid interconnection standards | IEEE 1547, UL 1741 SA - CA Rule 21, HECO Rule 14H | | |
| Advanced grid support capabilities | L/HFRT, L/HVRT, Volt-VAr, Volt-Watt, Frequency-Watt, Ramp Rate Control, Fixed Power Factor | | |
| Warranty | | | |
| Standard | 10 years | | |
| Optional extensions | 15 / 20 years | | |
| ○ Optional features ● Standard features - Not available | | | |
| Type designation | STP 33-US-41 | STP 50-US-41 | STP 62-US-41 |



SMA Data Manager M
EDMM-US-10



SMA Sensor Module
MD.SEN-US-40



Universal Mounting System
UMS_KIT-10



AC Surge Protection Module Kit
AC_SPD_KIT1-10, AC_SPD_KIT2_T1T2
DC Surge Protection Module Kit
DC_SPD_KIT4-10, DC_SPD_KIT5_T1T2

DRY TYPE TRANSFORMER SPECIFICATION

TRANSFORMER SPECIFICATION

| | |
|------------------|--------|
| RATING | 500kVA |
| COOLING | ANN |
| TEMPERATURE RISE | 115°C |
| PHASES | 3 |
| FREQUENCY | 60Hz |
| K-FACTOR | 4 |

| | PRIMARY | SECONDARY |
|-------------|----------|-----------|
| VOLTAGE | 600V | 480Y/277V |
| TAPS - FCAN | 2 x 2.5% | - |
| TAPS - FCBN | 2 x 2.5% | - |
| BIL | 10kV | 10kV |

| | |
|----------------------|-------------------------|
| CONDUCTOR | ALUMINUM |
| WINDINGS | POLYESTER RESIN DIPPED |
| INSULATION CLASS | 220°C |
| IMPEDANCE (@ 135°C) | 4.0% - 6.0% |
| MIN EFFICIENCY | 99.14% @ 35% LOAD, 75°C |
| AVG. SOUND LEVEL | 60dBA |
| ELECTROSTATIC SHIELD | NONE |
| EST. WEIGHT | 3860 lbs [1755kg] |

TERMINALS AND CABLE LUGS

| | PRIMARY | SECONDARY |
|-----------------|-------------------------------------|-----------|
| LOCATION | FRONT | REAR |
| LINE LUGS (/PH) | PADS | PADS |
| NEUTRAL LUGS | N/A | PADS |
| GROUND LUG | 300 MCM-6 AWG LUG ON ENCLOSURE BASE | |

WIRING / CONNECTIONS

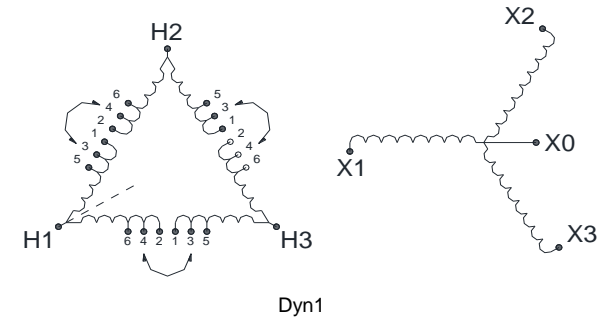
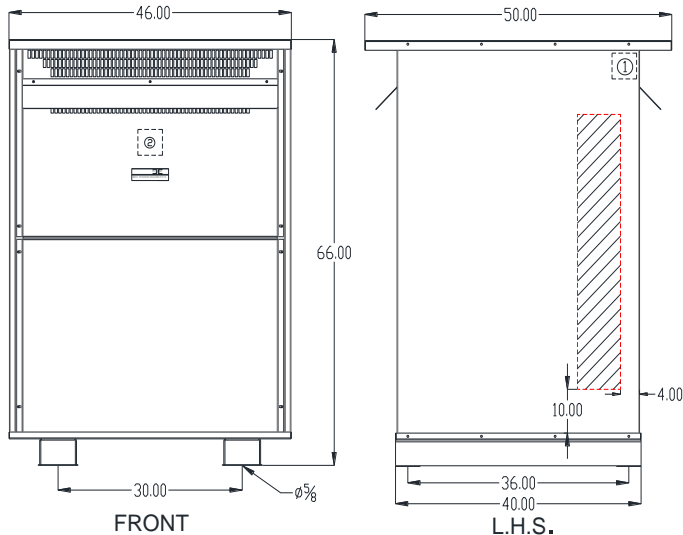
| PRIMARY: H1-H2-H3 | | |
|-------------------|--------|--------|
| VOLTAGE | % TAP | LINKS: |
| 630 | 105.0% | 1-2 |
| 615 | 102.5% | 2-3 |
| 600 | 100.0% | 3-4 |
| 585 | 97.5% | 4-5 |
| 570 | 95.0% | 5-6 |

| SECONDARY: X0-X1-X2-X3 | | |
|------------------------|-------|----------------------------|
| VOLTAGE | PHASE | CONNECT LOAD TO |
| 480 | 3 | X1-X2-X3 |
| 277 | 1 | X0-X1, X0-X2, AND/OR X0-X3 |

FEATURES

- NEOPRENE ANTI-VIBRATION PADS INSTALLED BETWEEN CORE & COIL AND ENCLOSURE BASE
- LUG FOR EARTH GROUNDING PROVIDED
- SUITABLE FOR NON-SINUSOIDAL CURRENT LOAD WITH K-FACTOR NOT TO EXCEED 4
- NEUTRAL SIZED FOR 200% OF LINE CURRENT
- SEISMIC RATED FOR USA ZONE 4 AND CANADA ZONE 6
- CSA CERTIFIED (FILE # LR34493)
- UL LISTED (FILE # E108255)
- ISO 9001 QUALITY MANAGEMENT SYSTEM
- EFFICIENCY MEETS OR EXCEEDS:
 - CANADA: SOR/DORS/2018-201 (NRCAN 2019)
 - CSA: CSA C802.2-18
 - USA: DOE 10 CFR PART 431:2016-01 (DOE 2016)

1) Location of nameplate and labels for Canada
 2) Location of nameplate and labels for USA
 *Recommended area for side cable entry (7"x50") on either side



ENCLOSURE

| | |
|------------------|-----------------------|
| ENCLOSURE PART # | E3R-10 |
| ENCLOSURE RATING | TYPE 3R (INDOOR)* |
| CONSTRUCTION | VENTILATED |
| MATERIAL | STEEL |
| FINISH | POLYESTER POWDER COAT |
| COLOR | ANSI/ASA 61 (GREY) |
| MOUNTING | FLOOR |

*SPRINKLERPROOF WHEN THE ANGLE BETWEEN SPRINKLER HEADS AND OPENING IN THE ENCLOSURE DOES NOT EXCEED 45 DEGREE FROM THE VERTICAL.

*FOR PROPER VENTILATION FOR FLOOR INSTALLATION KEEP AT LEAST 6 INCHES FROM ADJACENT WALLS

| REV | REMARKS | BY | DATE | PRELIMINARY DRAWING | PRODUCT | K-FACTOR RATED ISOLATION TRANSFORMER |
|-----|---------|----|------|---|-----------------|--------------------------------------|
| | | | | THIS DRAWING MAY NOT TRULY REFLECT OUR FINAL DESIGN. ANY ORDER(S) MUST BE ACCOMPANIED BY OR REFER TO THIS DRAWING. REX POWER MAGNETICS RESERVES THE RIGHT TO CHANGE OR REVISE THESE SPECIFICATIONS WITHOUT NOTICE | MODEL / CAT No. | BA500J-P/K4/T115/Z3 |
| | | | | | CUSTOMER | - |
| | | | | | PO # | - |
| | | | | | SWO # | - QTY - |
| | | | | | Prepared By | C.G. Date 9/21/2020 |
| | | | | | Approved By | Date - |



Heavy Duty Safety Switches

Selection



| System | Ampere Rating | Indoor — Type 1 | | Outdoor — Type 3R | | Horsepower Rating [Ⓞ] | | | | | | | | 250 Volt DC | 600 Volt DC |
|--------|---------------|-----------------|--------------------------|-------------------|--------------------------|--------------------------------|-----------------|-----------------|-----------------|-------------|-------------|--|--|-------------|-------------|
| | | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480V AC | | 600V AC | | 250 Volt DC | 600 Volt DC | | | | |
| | | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | | | | | | |

600 Volt Fusible[Ⓢ]

2-Pole, 2-Fuse[Ⓢ]

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/600 Volt DC | | | | | | | | | |
|---------------|----------------|--------------------------|----------------|--------------------------|-------------------------------------|-----------------|-----------------|-----------------|-------------|-------------|---|---|----|----|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 250 Volt DC | 600 Volt DC | | | | |
| 30 | HF261 | 15 | HF261R | 15 | 3 | 7½ | — | — | 3 | 10 | — | — | 5 | 15 |
| 60 | HF262 | 20 | HF262R | 20 | 5 | 20 | — | — | 10 | 25 | — | — | 10 | 30 |
| 100 | HF263 | 26 | HF263R | 27 | 10 | 30 | — | — | 15 | 40 | — | — | 20 | 50 |

3-Pole, 3-Fuse

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|---------------|---------------------|--------------------------|----------------------|--------------------------|--|-----------------|-----------------|-----------------|-------------|-------------|-----|-----|----|-----------------|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 250 Volt DC | 600 Volt DC | | | | |
| 30 | HF361 | 14 | HF361R | 15 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| 30 | HF361L [Ⓢ] | 19 | HF361RL [Ⓢ] | 20 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| 60 | HF362 | 19 | HF362R | 20 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| 60 | — | — | HF362RL [Ⓢ] | 25 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| 100 | HF363 | 24 | HF363R | 25 | 5 | 20 | 25 | 60 | 15 | 40 | 30 | 75 | 20 | 50 [Ⓢ] |
| 200 | HF364 | 48 | HF364R | 49 | 25 | 50 | 50 | 125 | 30 | 50 | 60 | 150 | 40 | 50 |
| 400 | HF365A [Ⓢ] | 93 | HF365RA [Ⓢ] | 157 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 600 | HF366A [Ⓢ] | 98 | HF366RA [Ⓢ] | 161 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 800 | HF367 | 365 | HF367R | 365 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — |
| 1200 | HF368 | 383 | HF368R | 385 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — |

3-Pole, 3-Fuse and Solid Neutral

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|---------------|----------------|--------------------------|----------------|--------------------------|--|-----------------|-----------------|-----------------|-------------|-------------|-----|-----|----|-----------------|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 250 Volt DC | 600 Volt DC | | | | |
| 30 | HF361N | 14 | HF361NR | 15 | 3 | 7½ | 5 | 15 | 3 | 10 | 7½ | 20 | 5 | — |
| 60 | HF362N | 19 | HF362NR | 20 | 5 | 20 | 15 | 30 | 10 | 25 | 15 | 50 | 10 | 30 [Ⓢ] |
| 100 | HF363N | 25 | HF363NR | 26 | 10 | 30 | 25 | 60 | 15 | 40 | 30 | 75 | 20 | 50 [Ⓢ] |
| 200 | HF364N | 49 | HF364NR | 50 | 25 | 50 | 50 | 125 | 30 | 50 | 60 | 150 | 40 | 50 |
| 400 | HF365NA | 94.6 | HF365NRA | 94.6 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 600 | HF366NA | 99.6 | HF366NRA | 99.6 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 800 | HF367N | 375 | HF367NR | 375 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |
| 1200 | HF368N | 395 | HF368NR | 388 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |

600 Volt Fusible[Ⓢ] (For 2-Pole Applications use outside poles of 3-Pole Switches)

2-Pole, 2-Fuse[Ⓢ]

| Ampere Rating | Type 4/4X Stainless [Ⓢ] | | Type 12 Industrial [Ⓢ] | | 480 Volt AC/600 Volt AC/600 Volt DC | | | | | | | | | |
|---------------|----------------------------------|--------------------------|---------------------------------|--------------------------|-------------------------------------|-----------------|-----------------|-----------------|-------------|-------------|---|---|----|----|
| | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 250 Volt DC | 600 Volt DC | | | | |
| 30 | HF261S | 15 | HF261J■ | 15 | 3 | 7½ | — | — | 3 | 10 | — | — | 5 | 15 |
| 60 | HF262S | 20 | HF262J■ | 20 | 5 | 20 | — | — | 10 | 25 | — | — | 10 | 30 |
| 100 | HF263S■ | 27 | HF263J■ | 27 | 10 | 30 | — | — | 15 | 40 | — | — | 20 | 50 |

3-Pole, 3-Fuse

| Ampere Rating | Catalog Number | Ship Wt. (lbs.) Std. Pkg | Catalog Number | Ship Wt. (lbs.) Std. Pkg | 480 Volt AC/600 Volt AC/250 Volt DC [Ⓢ] | | | | | | | | | |
|---------------|----------------------|--------------------------|----------------------|--------------------------|--|-----------------|-----------------|-----------------|-------------|-------------|-----|-----|----|-----------------|
| | | | | | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 1-Phase, 2-Wire | 3-Phase, 3-Wire | 250 Volt DC | 600 Volt DC | | | | |
| 30 | HF361S | 13 | HF361J | 14 | — | — | 5 | 15 | — | — | 7½ | 20 | 5 | — |
| 60 | HF362S | 20 | HF362J | 20 | — | — | 15 | 30 | — | — | 15 | 50 | 10 | 30 [Ⓢ] |
| 100 | HF363S | 25 | HF363J | 25 | — | — | 25 | 60 | — | — | 30 | 75 | 20 | 50 [Ⓢ] |
| 200 | HF364S | 49 | HF364J | 49 | — | — | 50 | 125 | — | — | 60 | 150 | 40 | 50 |
| 400 | HF365SA [Ⓢ] | 93 | HF365JA [Ⓢ] | 93 | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 400 | HF365SSA | 93 | — | — | — | — | 100 | 250 | — | — | 125 | 350 | 50 | — |
| 600 | HF366SA [Ⓢ] | 98 | HF366JA [Ⓢ] | 98 | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 600 | HF366SSA | 98 | — | — | — | — | 150 | 400 | — | — | 200 | 500 | 50 | — |
| 800 | HF367S | 370 | HF367J■ | 365 | — | — | 200 | 500 | — | — | 250 | 500 | 50 | — |
| 1200 | HF368S■ | 388 | HF368J■ | 388 | — | — | 250 | 500 | — | — | 250 | 500 | 50 | — |

■ Built to order. Allow 3-5 weeks for delivery.

Ⓢ 60-600A 3-Pole switches are also rated 600V DC.

Ⓢ Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

Ⓢ Use 3-Pole switch for 200A applications.

Ⓢ Dual horsepower ratings: Std.- applies when non-time delay fuses are installed. Max.- applies when time-delay fuses are installed.

Ⓢ Suitable for use as service entrance equipment except on 1200 Amp solidly grounded wye systems per NEC 230.95.

Ⓢ Also rated Type 3S/3R.

Ⓢ Indicates oversized enclosure (30A switch with 60A lugs in a 60A enclosure or 60A switch with 100A lugs in a 100A enclosure).

Ⓢ 600V DC & 600V DC horsepower rating shown requires (2) poles to be connected in series.

Ⓢ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 4-18.

General and Heavy Duty Safety Switches

Dimensions

Safety Switch Dimensions (Inches)* & Shipping Weights

| Catalog Number | Height | | | Width | | Depth | | Knockout Diagram ^① | Shipping Weight (lbs.) |
|--|--------|-------------|------------------|-------|---------------|-------|---------------|-------------------------------|------------------------|
| | Box A | With Door B | With Rain Shed C | Box D | With Handle E | Box F | With Handle G | | |
| HF362J, JW | 16.27 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 20 |
| HF362N | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 19 |
| HF362NR | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 20 |
| HF362R, RPV, RPVPG, RW | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 20 |
| HF362RL | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 25 |
| HF362S, SS, SSW, SW | 16.27 | 19.31 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 20 |
| HF363, PV, PVP | 21.95 | 23.15 | — | 9.64 | 12.01 | 5.05 | 10.17 | S10 | 24 |
| HF363J, JW | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 25 |
| HF363N | 21.95 | 23.15 | — | 9.64 | 12.01 | 5.05 | 10.17 | S10 | 25 |
| HF363NR | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 26 |
| HF363R, RPV, RPVPG | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 25 |
| HF363S, SS, SSW, SW | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 25 |
| HF364, PV, PVP | 29.9 | 31.07 | — | 14.62 | 16.98 | 6.36 | 12.33 | S12 | 48 |
| HF364J, JW | 29.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 49 |
| HF364N | 29.9 | 31.07 | — | 14.62 | 16.98 | 6.36 | 12.33 | S12 | 49 |
| HF364NR | 29.9 | — | 31.42 | 14.61 | 16.99 | 6.36 | 12.33 | S13 | 48 |
| HF364R, RPV, RPVPG | 29.9 | — | 31.42 | 14.61 | 16.99 | 6.36 | 12.33 | S13 | 49 |
| HF364S, SS, SSW, SW | 29.96 | 31.07 | — | 14.62 | 16.95 | 6.63 | 12.58 | — | 49 |
| HF365A | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 93 |
| HF365JA, HF365JWA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 93 |
| HF365NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 94.6 |
| HF365NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 94.6 |
| HF365RA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 93 |
| HF365SA, HF365SWA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF365SSA, HF365SSWA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 93 |
| HF366A | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 98 |
| HF366JA, HF366JWA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 98 |
| HF366NA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S18 | 99.6 |
| HF366NRA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 99.6 |
| HF366RA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 98 |
| HF366SA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF366SSA | 45.32 | 45.81 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 98 |
| HF367 | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 380 |
| HF367J | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 380 |
| HF367N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 382 |
| HF367NR | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 386 |
| HF367R | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 382 |
| HF367S | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 380 |
| HF368, J, S | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 383 |
| HF368N | 66.67 | 67.16 | — | 38.4 | 39.96 | 9.24 | 14.68 | — | 385 |
| HF368NR | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 388 |
| HF368R | 66.67 | — | 67.74 | 38.4 | 40.25 | 9.24 | 14.68 | — | 385 |
| HNF365JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 75 |
| HNF365RA | 33.47 | 33.96 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 75 |
| HNF365SA | 33.47 | 33.96 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 75 |
| HNF365SSA | 33.47 | 33.96 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 75 |
| HNF366SA | 33.47 | 33.96 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 77 |
| HNF366SSA | 33.47 | 33.96 | — | 22.4 | 23.404 | 7.34 | 10.347 | — | 77 |
| HNF366JA | 45.32 | 45.81 | — | 22.4 | 23.404 | 6.97 | 10.05 | — | 77 |
| HNF366RA | 33.47 | 33.96 | — | 22.4 | 23.404 | 6.94 | 9.93 | S19 | 77 |
| HNF361, PV, PVP also HNF261 & HNF362H | 11.11 | 12.31 | — | 6.64 | 9.01 | 5.05 | 10.17 | S7 | 12 |
| HNF361J, JW also HNF261J & HNF362JH | 11.12 | 14.14 | — | 6.65 | 9.02 | 5.56 | 10.46 | — | 13 |
| HNF361R, RPV, RPVPG also HNF261R & HNF362RH | 11.11 | — | 12.63 | 6.64 | 9.01 | 5.05 | 10.17 | S9 | 13 |
| HNF361RL | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 20 |
| HNF361S, SS, SSW, SW also HNF261S & HNF362SH | 11.12 | 14.14 | — | 6.65 | 9.02 | 5.56 | 10.46 | — | 13 |
| HNF362, PV, PVP also HNF262 | 16.26 | 17.46 | — | 9.15 | 11.53 | 5.05 | 10.17 | S16 | 18 |
| HNF362J, JW also HNF262J | 16.27 | 17.46 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 19 |
| HNF362R, RPV, RPVPG also HNF262R | 16.26 | — | 17.77 | 9.16 | 11.53 | 5.05 | 10.17 | S17 | 19 |
| HNF362RL | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 24 |
| HNF362S, SS, SSW, SW also HNF262S | 16.27 | 17.46 | — | 9.17 | 11.47 | 5.33 | 10.46 | — | 19 |
| HNF363, PV, PVP also HNF263 | 21.95 | 23.15 | — | 9.64 | 12.01 | 5.05 | 10.17 | S10 | 23 |
| HNF363J, JW also HNF263J | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 24 |
| HNF363R, RPV, RPVPG also HNF263R | 21.95 | — | 23.46 | 9.64 | 11.97 | 5.05 | 10.17 | S11 | 24 |
| HNF363S, SS, SSW, SW also HNF263S | 21.96 | 23.16 | — | 9.65 | 12.02 | 5.34 | 10.46 | — | 24 |

*For inches / millimeters conversion, multiply inches by 25.4.

① Knocks not provided on Type 4 / 4X and 12 or in 800 & 1200A switches.

Application

Type P4 Panelboards

Table P4-3 – Main Breaker Selection

| Ampere rating | Breaker type | | | Maximum IC (KA) Symmetrical Amperes | | | Main Breaker Unit Space in inches (mm) | Continuous Current Rating |
|---------------|------------------------|-----------------|----------------|-------------------------------------|------------|--------------------|--|-----------------------------------|
| | Trip type ¹ | Frame type | Breaker family | 240V | 480V | 600V | | |
| | | | | | | | | |
| 400A | TMTU | JXD6, JD6 | Sentron | 65 | 35 | 22 | 8.75 (222) | 200, 225, 250, 300, 350, 400 |
| | | HJXD6, HJD6 | Sentron | 100 | 65 | 35 | 8.75 (222) | 200, 225, 250, 300, 350, 400 |
| | | HHJXD6, HHJD6 | Sentron | 200 | 100 | 50 | 8.75 (222) | 200, 225, 250, 300, 350, 400 |
| | | CJD6 | Sentron | 200 | 150 | 100 | 8.75 (222) | 200, 225, 250, 300, 350, 400 |
| | ETU | NJ | VL | 65 | 35 | 25 | 6.25 (159) | 250, 400 |
| | | SJD6 | Sentron | 65 | 35 | 25 | 8.75 (222) | 200, 300, 400 |
| | | HJ | VL | 100 | 65 | 25 | 6.25 (159) | 250, 400 |
| | | SHJD6 | Sentron | 100 | 65 | 35 | 8.75 (222) | 200, 300, 400 |
| | | LJ | VL | 200 | 100 | 25 | 6.25 (159) | 250, 400 |
| | | SCJD6 | Sentron | 200 | 150 | 100 | 8.75 (222) | 200, 300, 400 |
| 600A | TMTU | LXD6 | Sentron | 65 | 35 | 25 | 8.75 (222) | 450, 500, 600 |
| | | LD6 | Sentron | 65 | 35 | 25 | 8.75 (222) | 250, 300, 350, 400, 450, 500, 600 |
| | | HLXD6, HLD6 | Sentron | 100 | 65 | 35 | 8.75 (222) | 250, 300, 350, 400, 450, 500, 600 |
| | | HHLXD6, HHL6 | Sentron | 200 | 100 | 50 | 8.75 (222) | 250, 300, 350, 400, 450, 500, 600 |
| | | CLD6 | Sentron | 200 | 150 | 100 | 8.75 (222) | 250, 300, 350, 400, 450, 500, 600 |
| | ETU | NL ² | VL | 65 | 35 | 18 | 6.25 (159) | 400, 600 |
| | | SLD6 | Sentron | 65 | 35 | 25 | 8.75 (222) | 300, 400, 500, 600 |
| | | HL ² | VL | 100 | 65 | 18 | 6.25 (159) | 400, 600 |
| | | SHLD6 | Sentron | 100 | 65 | 35 | 8.75 (222) | 300, 400, 500, 600 |
| | | LL ² | VL | 200 | 100 | 18 | 6.25 (159) | 400, 600 |
| SCLD6 | Sentron | 200 | 150 | 100 | 8.75 (222) | 300, 400, 500, 600 | | |
| 800A | TMTU | NM ³ | VL | 65 | 35 | 25 | 8.75 (222) | 600, 700, 800 |
| | | HM ³ | VL | 100 | 65 | 35 | 8.75 (222) | 600, 700, 800 |
| | | LM ³ | VL | 200 | 100 | 50 | 8.75 (222) | 600, 700, 800 |
| | ETU | NM ³ | VL | 65 | 35 | 25 | 8.75 (222) | 600, 800 |
| | | HM ³ | VL | 100 | 65 | 35 | 8.75 (222) | 600, 800 |
| | | LM ³ | VL | 200 | 100 | 50 | 8.75 (222) | 600, 800 |

¹ TMTU = Thermal Magnetic Trip Unit and ETU = Electronic Trip Unit.

² 100% ratings are not available for the VL LG frame, replace with VL MG frame @ 600A rated 100%.

³ 100% ratings are not available for the VL MG. Use a P5 panel for this application with the VL NG frame @ 800A rated 100%.

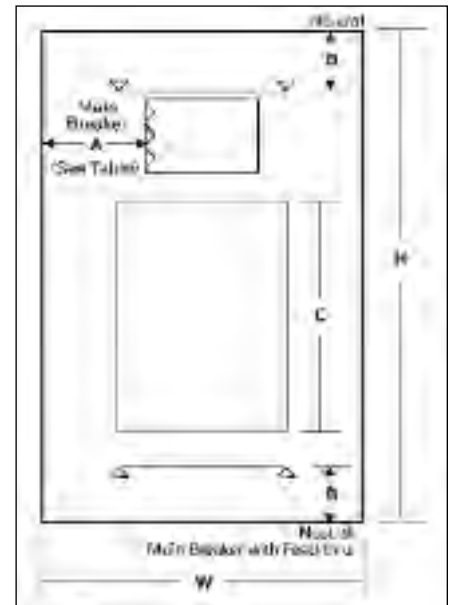
Table P4-4 – Enclosure Selection ¹

| Enclosure Dimension in Inches (mm) | | | Available Unit Space in Inches (mm) Dimension "C" in Fig. 4-1 | | |
|------------------------------------|----------|----------|---|--------------|--------------|
| H | W | D | Main Lug Only | Main Breaker | 800A |
| | | | 400 / 800A | 400A/600A | |
| 60 (1524) | 32 (813) | 10 (254) | 30 (762) | 23.75 (603) | 21.25 (540) |
| 75 (1905) | 32 (813) | 10 (254) | 45 (1143) | 38.75 (984) | 26.25 (921) |
| 90 (2286) | 32 (813) | 10 (254) | 60 (1524) | 53.75 (1365) | 51.25 (1302) |

¹ Standard trim is four piece without door. Surface or flush one piece trim is available for 32 in. (813 mm) wide circuit breaker panels.

Table P4-5 – Main Breaker Lug Location Reference (Fig. P4-1)

| Ampere Rating | Breaker Type | Dimensions in Inches (mm) | |
|---------------|--------------------------------------|---------------------------|--------------|
| | | A | B |
| 400 | JXD6, JD6, HJXD6, HJD6 | 10.425 (265) | 13.125 (333) |
| 400 | HHJXD6, HHJD6 | | |
| 400 | NJ, HJ, LJ | | |
| 400 | SJD6, SHJD6 | | |
| 400 | CJD6, SCJD6 | | |
| 600 | LXD6, LD6, HLXD6, HLD6, HHLXD6, HHL6 | | |
| 600 | NL, HL, LL | | |
| 600 | SLD6, SHLD6 | | |
| 600 | CLD6, SCLD6 | | |
| 800 | NM, HM, LM, | | |

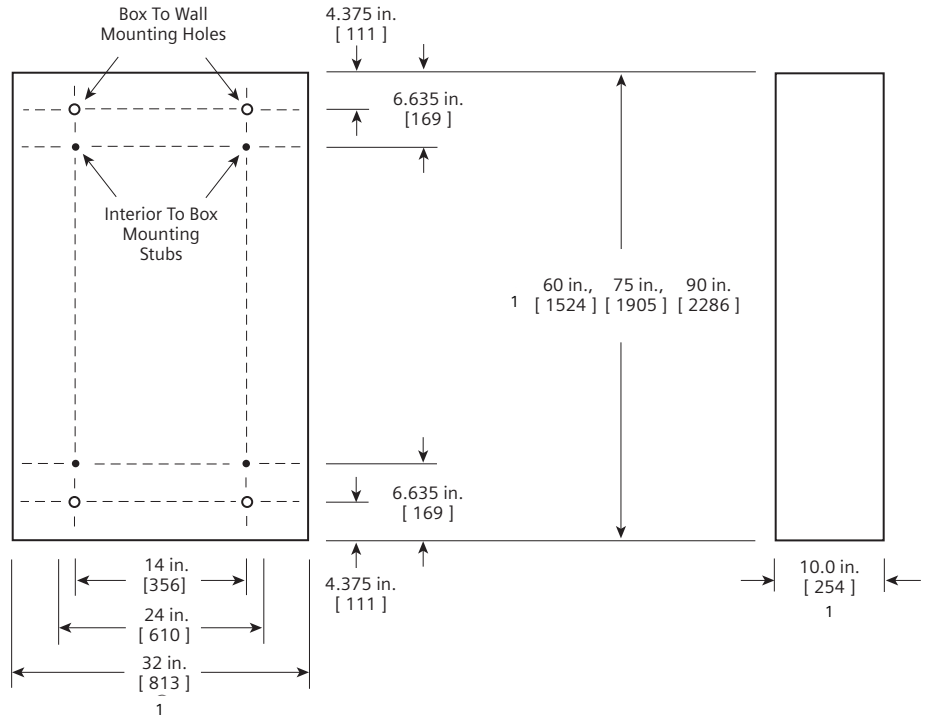
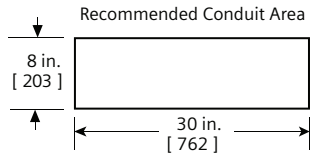
Fig. P4-1


Dimensions

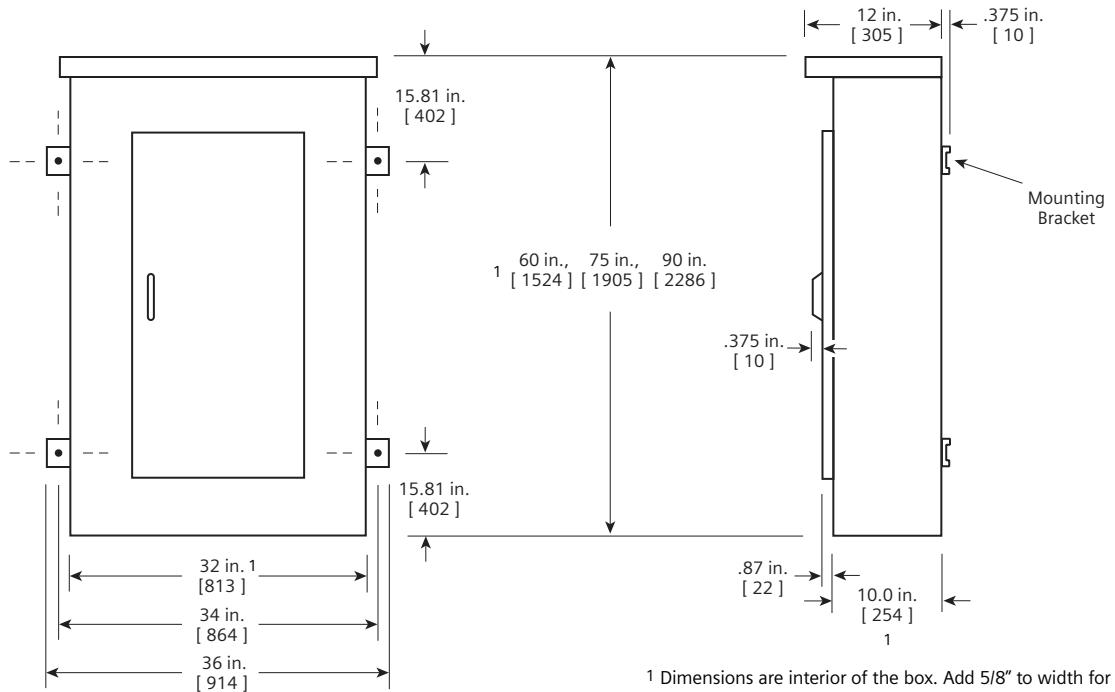
Type P4 Panelboards

Type 1 Box

Box is symmetrical



Type 3R and 3R/12 Box



¹ Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.


Dimensions shown in inches and millimeters [].



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