

The Sonoran 1 is a single phase, on-line, double conversion, solid state inverter system utilizing patented ECM technology. Each system consists of a solid-state inverter, a temperature compensated rectifier/battery charger, a continuous duty static switch, an internal maintenance bypass switch, battery plant, status/control panel, and synchronizing circuitry. The Sonoran 1 functions in conjunction with the existing building electrical system to provide high quality power conditioning, back-up power protection and distribution for lighting loads and other critical loads. The enclosure is a NEMA 4 or 4X (outdoor) or NEMA 12 or 12X (indoor) rain/weatherproof enclosure designed for harsh environmental conditions. This Energy Star rated unit is an economical and reliable solution for your emergency backup needs.

Model: \_\_\_\_\_ Date: \_\_\_\_\_  
 Accessories: \_\_\_\_\_  
 Job Name: \_\_\_\_\_ Type: \_\_\_\_\_



## SPECIFICATIONS

|                                   |   |
|-----------------------------------|---|
| <b>Standard Power Level:</b>      | 0.35, 0.525, 0.7, 0.875, 1.05, 1.4, 2.0, 2.4, 2.6, 3.0, 3.4, 3.8, 4.2, 4.7, 5.25, 7.0, 8.0, 10.0, 12.0, 14.0, 18.0 and 21.0KW |
| <b>Input Voltage:</b>             | 120, 208, 240, 277 or 480 VAC   |
| <b>Input Voltage Range:</b>       | +10% -15%   |
| <b>Output Voltage:</b>            | 120, 277, 480, 120/240 or 120/277 VAC   |
| <b>Output Voltage Regulation:</b> | ±3% for all loads and battery discharge mode  |
| <b>Output Frequency Range:</b>    | 60 Hz, ±1%  |
| <b>Output Wave Form:</b>          | Sine-wave <5% @ 100% linear load  |
| <b>Crest Factor:</b>              | 2.5:1 typical   |
| <b>Input Protection:</b>          | Input Main Circuit Breaker  |
| <b>Output Protection:</b>         | Output Main Circuit Breaker   |
| <b>Surge Protection:</b>          | The unit will protect itself and the load against surges defined in ANSI/IEEE C62.45 category A/B                             |
| <b>Battery:</b>                   | Sealed maintenance-free (AGM) lead calcium  |
| <b>Recharge Current:</b>          | Conforms to UL924 standards   |
| <b>External Battery:</b>          | Provision for hardware connection of external battery cabinets or DC source   |
| <b>Efficiency:</b>                | ≥92% at 100% linear load  |
| <b>Audible Noise:</b>             | <45dBA  |
| <b>Listing:</b>                   | ETL listed to UL 924 and 1778<br>cETL listed to CSA-22.2 No. 107.3 & No. 141  |
| <b>Operating Temperature:</b>     | -20°C to 50°C (-4°F to 122°F)   |
| <b>Storage Temperature:</b>       | -30°C to 60°C (-22°F to 140°F)  |
| <b>Humidity:</b>                  | 5 - 95%, Non-condensing   |
| <b>Cabinet:</b>                   | NEMA 4 and NEMA 12, or NEMA 4X and NEMA 12X (stainless steel)   |
| <b>Compliance:</b>                | Assembled in the USA with global components. American Recovery and Reinvestment Act (ARRA) compliant.                         |



**ORDERING INFORMATION** Example: SON1-7.0-120-277-RP-90

| Series        | Power Rating  | Input Voltage <sup>1</sup> | Output Voltage <sup>1</sup> | Options   | Run Time <sup>4</sup> |
|---------------|---------------|----------------------------|-----------------------------|---|-----------------------|
| SON1          | 0.35 = 350W   | 120 = 120VAC               | 120 = 120VAC                | ECM120/# <sup>2</sup> = 120V Environmental Control Module / Qty | 5 = 5 Min             |
|               | 0.525 = 525W  | 208 = 208VAC               | 277 = 277VAC                | ECM277/# <sup>2</sup> = 277V Environmental Control Module / Qty | 10 = 10 Min           |
|               | 0.7 = 700W    | 240 = 240VAC               | 480 = 480VAC                | NOF/V/# = Normally OFF Output Circuit / Voltage / Qty           | 15 = 15 Min           |
|               | 0.875 = 875W  | 277 = 277VAC               | 120/240 = 120/240VAC        | NOH/V/# = Normally OFF "Hold ON" / Voltage / Qty                | 20 = 20 Min           |
|               | 1.05 = 1.05KW | 480 = 480VAC               | 120/277 = 120/277VAC        | OCB/V/#/A = Output Circuit Breakers / Voltage / Qty / Amps      | 25 = 25 Min           |
|               | 1.4 = 1.4KW   |                            |                             | EPO = Emergency Power Off                                       | 30 = 30 Min           |
|               | 2.0 = 2.0KW   |                            |                             | RP = Remote Indicator Panel                                     | 45 = 45 Min           |
|               | 2.4 = 2.4KW   |                            |                             | SNMP = SNMP Card  | 60 = 60 Min           |
|               | 2.6 = 2.6KW   |                            |                             | FCON = Form C Contacts  | 90 = 90 Min (Std)     |
|               | 3.0 = 3.0KW   |                            |                             | OST <sup>3</sup> = Onsite Start-Up                              | 120 = 120 Min         |
|               | 3.4 = 3.4KW   |                            |                             | IDB = Internal Dimmer Bypass                                    | 180 = 180 Min         |
|               | 3.8 = 3.8KW   |                            |                             | EMB = External Maintenance Bypass Switch                        | 240 = 240 Min         |
|               | 4.2 = 4.2KW   |                            |                             | HTR = Heater  |                       |
|               | 4.7 = 4.7KW   |                            |                             | EW = Extended Warranty  |                       |
|               | 5.25 = 5.25KW |                            |                             | SS = Stainless Steel Enclosure                                  |                       |
|               | 7.0 = 7.0KW   |                            |                             |   |                       |
|               | 8.0 = 8.0KW   |                            |                             |   |                       |
| 10.0 = 10.0KW |               |                            |                             |   |                       |
| 12.0 = 12.0KW |               |                            |                             |   |                       |
| 14.0 = 14.0KW |               |                            |                             |   |                       |
| 18.0 = 18.0KW |               |                            |                             |   |                       |
| 21.0 = 21.0KW |               |                            |                             |   |                       |

**Notes**

<sup>1</sup> Consult factory for other voltages, may effect weight, size and number of cabinets

<sup>2</sup> One ECM is used per switching device or circuit

<sup>3</sup> Includes one additional year of warranty on unit, consult factory

<sup>4</sup> Consult factory for other run times

| Series   | Power Rating (KVA/KW) | Voltage (VAC)                   |   | UPS Cabinet Dimensions |     |     | Battery Cabinet Dimensions |      |   | Combined Weight (LBS) | BTU    | Battery Type   | Output Protection                                  | Safety Approval                             |
|--|-----------------------|---------------------------------|---|------------------------|-----|-----|----------------------------|------|---|-----------------------|--------|--|--|---|
|  |                       | Select Input                    | Select Output                           | W                      | H   | D   | W                          | H    | D |                       |        |  |  |   |
| Sonoran<br>1<br>Single<br>Phase<br>On-line<br>Inverter | 0.35KW                | 120<br>208<br>240<br>277<br>480 | 120<br>277<br>480<br>120/240<br>120/277 | 41"                    | 52" | 36" | Not Required               |      |   | 150                   | 95.2   | Sealed,<br>maintenance free<br>(AGM)<br>lead calcium | Input<br>and<br>ouput circuit<br>breakers standard | UL924<br>UL1778<br>NFPA101<br>NFPA70<br>NEC |
|  | 0.525KW               |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 630                   | 142.8  |  |  |   |
|  | 0.7KW                 |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 640                   | 190.4  |  |  |   |
|  | 0.875KW               |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 670                   | 238    |  |  |   |
|  | 1.05KW                |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 710                   | 285.6  |  |  |   |
|  | 1.4KW                 |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 790                   | 380.8  |  |  |   |
|  | 2.0KW                 |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 870                   | 544    |  |  |   |
|  | 2.4KW                 |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 920                   | 652.8  |  |  |   |
|  | 2.6KW                 |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 930                   | 707.2  |  |  |   |
|  | 3.0KW                 |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 980                   | 816    |  |  |   |
|  | 3.4KW                 |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 1030                  | 924.8  |  |  |   |
|  | 3.8KW                 |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 1090                  | 1033.6 |  |  |   |
|  | 4.2KW                 |                                 |   | 41"                    | 52" | 36" | Not Required               |      |   | 1150                  | 1142.4 |  |  |   |
|  | 4.7KW                 |                                 |   | 41"                    | 73" | 36" | Not Required               |      |   | 1630                  | 1278.4 |  |  |   |
|  | 5.25KW                |                                 |   | 41"                    | 73" | 36" | Not Required               |      |   | 1630                  | 1428   |  |  |   |
|  | 7.0KW                 |                                 |   | 41"                    | 73" | 36" | Not Required               |      |   | 1880                  | 1904   |  |  |   |
|  | 8.0KW                 |                                 |   | 41"                    | 73" | 36" | Not Required               |      |   | 1880                  | 2176   |  |  |   |
| 10.0KW   | 41"                   | 73"                             | 36"                                     | Not Required           |     |     | 2250                       | 2720 |   |                       |        |  |  |   |
| 12.0KW   | 41"                   | 73"                             | 36"                                     | Not Required           |     |     | 2640                       | 3264 |   |                       |        |  |  |   |
| 14.0KW   | 41"                   | 73"                             | 36"                                     | 41"                    | 52" | 36" | 2945                       | 3808 |   |                       |        |  |  |   |
| 18.0KW   | 41"                   | 73"                             | 36"                                     | 41"                    | 52" | 36" | 4145                       | 4896 |   |                       |        |  |  |   |
| 21.0KW   | 41"                   | 73"                             | 36"                                     | 41"                    | 52" | 36" | 4555                       | 5712 |   |                       |        |  |  |   |

## POWER RATING

75 - 21,000 watt, single phase output unit uses the latest technology to provide the most advanced performance and reliability features

## INPUT

120, 208, 240, 277 or 480 VAC

### AC Input Characteristics

- Input Frequency: 60 Hz
- Power walk-in: 0 to 100% over a 10-second period
- Magnetizing Inrush Current: Less than nominal input current for less than one cycle
- Input Surge Protection: The Sonoran 1 is equipped with standard input filter assembly will withstand surges per IEEE 587-1980/ANSI C62.41

## OUTPUT

120, 277, 480, 120/240 or 120/277 VAC

### AC Output Characteristics

- True On-line design is  $\geq 92\%$  efficient at 100% linear load
- Voltage Regulation: + 3% for no-load to full load and full 90 minute battery discharge mode
- Frequency: 60 Hz (+ 0.1Hz when free running).
- Voltage Distortion: Maximum 5% total (THD) @ 100% linear loads.
- Voltage Transient (Step Load) Response:
  - +/- 5% for 50% step load change
  - +/- 8% for 100% step load change
  - +/- 3% for loss or return of AC input power or manual transfer at full load
- Voltage Recovery Time: Return to within 3% of nominal value within 50 milliseconds
- Non-Linear Load Capability: Output voltage total harmonic distortion shall be less than 8% when connected to a 100% non-linear load with a crest factor not to exceed 2.5%
- Slew Rate: 1 Hz/second maximum
- Power Factor: Unity power factor
- Inverter Overload Capability:
  - 125% of rated load for 1 minute
  - 145% of rated load for 10 seconds
- Bypass Overload Capability: > 200% for one cycle; > 150% for 30 seconds

## BATTERIES

The Sonoran 1 module employs a valve regulated sealed lead calcium heavy-duty industrial battery, designed for auxiliary power service. The primary battery is furnished with an impact resistant plastic case and housed in matching battery cabinet. (Systems up to 12KW are self contained.)

- Protection against Deep Discharge and Self-Discharge: The Sonoran 1 is equipped with a device designed to protect the battery against deep discharge depending on discharge conditions, with isolation of the battery by a circuit breaker. In particular, a monitoring device shall adjust the battery shutdown voltage as a function of a discharge coefficient to avoid excessive discharge
- Battery Self-Test: The battery monitoring system shall be to perform the following automatic functions:
  - Battery circuit check
  - Partial discharge test customer selectable (12KW and above)
- Sealed, maintenance-free, lead calcium (AGM) batteries
- 10 year prorated warranty
- Guardian Smart Battery Monitoring System is TEMPERATURE COMPENSATED maintaining maximum runtime and battery life
- Microprocessor controlled recharge and overcharge protection is standard

## LAMPS AND LOADS

- Emergency power provides FULL LIGHT OUTPUT from all lamps and fixtures for the entire runtime
- Standard or LED Exits and other safety equipment
- Standard or electronic ballasts, dimming devices or panels, sensors and most control equipment
- Operates fluorescent, compact fluorescent, incandescent, quartz, LED and other lamp types

## PROTECTION

- Provides overload, surge and undercurrent protection using the latest technology and Guardian Diagnostics to protect system performance and reliability
- Surer protection against load surges as defined in ANSI/IEEE C62.45 category A and B

## CODES

- City of Chicago and New York approved
- Complies with the Buy American Act (Level 3)
- The Sonoran 1 shall meet the requirements of the following standards:
  - IEEE 587-1980/ANSI C62.41 1980 Standards for Surge Withstand Ability
  - FCC rules and regulations of Part 15, Subpart J, Class A
  - Meets UL 1778, UL 924, Standards for Lighting Inverter Equipment
  - NEMA PE 1 (National Electrical Manufacturers Association) - Lighting Inverter Systems
  - NEMA 250 (National Electrical Manufacturers Association) – Enclosures for Electrical Equipment (1000 Volts Maximum)
  - NFPA 70 – National Electrical Code
  - ISO 9001
  - Occupational Safety & Health Administration (OSHA)

## DIAGNOSTICS, MAINTENANCE AND ACCESSIBILITY

All Sonoran 1 sub-assemblies, as well as the battery, shall be accessible from the front only. The Sonoran 1 design provides maximum reliability and minimum MTTR (mean time to repair). The electronic Sonoran 1 control and monitoring assembly is fully microprocessor based. The unit is repairable by replacing standard subassemblies.

- Guardian Diagnostics provides complete self diagnostic capabilities and LED Monitoring
  - Informative advanced display and alarms allow complete control of your emergency lighting environment
  - Automatically performs periodic self-tests ensuring a safely lighted environment prior to an emergency
  - Single point of testing instead of multiple testing points with battery packs

## CABINET

- Modular design that enables flexible installation
- Enclosure: The Sonoran 1 is housed in a NEMA 4, NEMA 12 or NEMA 4X, NEMA 12X (stainless steel) freestanding locking enclosure. The mechanical structure of the unit is sufficiently strong and rigid to withstand handling and installation operations without risk. Access to Sonoran 1 subassemblies is through the front only. The sheet-metal elements in the structure shall be protected against corrosion by a suitable treatment, such as zinc electroplating, powder coating, epoxy paint or an equivalent
- Cable Access: The Sonoran 1 allows for side, top and bottom entry cables.
- Ventilation and Heat Rejection: The Sonoran 1 is designed specifically for forced air cooling. Air inlets are provided from the front, bottom of the Sonoran 1 enclosure. Air exhaust is achieved from the top or side portions of the unit
- Systems up to 12KW are self contained; larger systems require external battery cabinet(s)

## INSTALLATION

- Modular design allows easy installation in electrical closet or other convenient locations
- Phone assisted factory start-up standard for all systems
- Extended warranty available
- The Sonoran 1 shall operate under the following environmental conditions:
  - Temperature:
    - Sonoran 1 Module
      - Operating: -20°C to 50°C (-4°F to 122°F)
      - Non-Operating: -30°C to +60°C (-22°F to 140°F)
    - Batteries: 25°C (77°F)
  - Relative humidity (operating and storage): 5 to 100% non-condensing
  - Barometric Pressure:
    - Up to 1000 meters above sea level
    - Up to 2000 meters with ambient temperature less than 28°C
    - Up to 12,000 meters above sea level non operating
  - Audible Noise: 45dBA at 3 feet
  - Enclosure is NEMA 4X outdoor completely sealed or NEMA 12 indoor completely sealed, either enclosure includes heat exchanger for complete environmental control of electronics and batteries
- Site Testing and Start-Up – If selected, the inverter system will be checked, started and tested by a manufacturer's qualified field service engineer either by phone start-up (standard) or by optional onsite start up when performed by a factory technician

**SPECIAL APPLICATIONS**

- Barron offers numerous UL924 optional devices to meet unusual or difficult application parameters
- ECM – Eco-Control Module allows fixtures and lamps on the emergency circuit(s) to be operated by normal switching and/or dimming devices in NON-emergency conditions
- Dimming Panel Interface allows use with emergency lights controlled by common dimmer panel

**DELIVERY, STORAGE, AND HANDLING**

- All products will be packaged in a manner to prevent penetration by debris and to allow safe delivery by all modes of ground transportation and air transportation where specified
- Prior to shipping all products will be inspected at the factory for damage
- Equipment shall be protected against extreme temperature and humidity and shall be stored in a conditioned or protected environment
- Equipment containing batteries shall not be stored for a period exceeding three months without powering up the equipment for a period of eight hours to recharge the batteries

**WARRANTY**

- One (1) year full warranty on system electronics (with phone assisted start-up), consult factory for Onsite Start-Up option warranty
- Battery warranty one (1) year with nine (9) years pro-rated
- Five (5) year power train warranty
- Maintenance contracts available