Automated smart charger delivers non-stop DC power

- For critical applications – energy production, communications, utilities
- Filtered, battery eliminator output – delivers stable, smooth DC
- Precise, temperature compensated charging – maximizes battery life
- Digital user interface – offers easy to understand display and controls
- Dual Path cooling – reduces internal temperatures for longest life
- Hardened design – resists extreme temperatures and electrical transients
SENS ECU is the core of a high reliability non-stop DC power system.

DC battery systems are vital to mission critical applications such as oil and gas pipelines, electric power distribution and telecommunications. SENS ECU delivers more than just smooth DC power to these vital applications. Together with an appropriate battery SENS ECU creates a highly dependable non-stop DC power system.

ECU makes the most reliable DC power system possible for any given battery. ECU’s automated, precise charging includes temperature compensation and overcharge protection to assure correct battery charge even in uncontrolled environments. Battery makers agree that this real-time tailoring of charging characteristics to battery condition is the key to maximum battery performance and life.

ECU delivers high reliability under harsh conditions. EnerGenius® reliability technology includes Dual Path convection cooling, generous component de-rating, overtemperature limiting, hardening to electrical transients and fully recessed controls to eliminate damage. Fully independent control, alarm and overvoltage protection systems prevent single point failures.

ECU is easy to understand and use. A comprehensive LCD display presents complete data on charger and battery status, including large digital meters. Two simple knobs operate a variety of adjustments and features. Generous standard equipment includes AC and DC circuit breakers, complete alarms, well-filtered output plus EMC and safety agency compliance.

SENS ECU is the totally automated smart charger that assures highest DC power reliability, even in severe environments.
ECU specifications

**AC input, single-phase**
- Standard input, 60 Hz rating:
  - < 3,500 W output: Field selectable 120/208/240 VAC
  - ≥ 3,500 W output: 240 VAC, 60 Hz
- Standard input, 50/60 Hz rating:
  - < 3,500 W output: Field selectable 120/208/220/240 VAC
  - ≥ 3,500 W output: 230 VAC, 50/60 Hz
- Optional inputs, 60 Hz:
  - 208, 480, 575 VAC, 60 Hz
- Optional input, 50/60 Hz:
  - 400 VAC, 50/60 Hz
- Input voltage selection: Field accessible terminal block
- Voltage tolerance:
  - 60 Hz: –12%, +6% per NEMA PE-5
  - 50 Hz: +10%
- Frequency tolerance: ±5%
- Efficiency: >91% (120-volt units)
- Input protection:
  - 2-pole circuit breaker, inrush limiter, soft start, transient suppression

**DC output**

- Nominal voltage ratings: 12, 24, 48, 110, 120, 220 or 240 volts
- Typical operating voltage: Typically 10% to 25% above nominal rating, depending on charge mode, battery type and number of cells
- Regulation: ±0.5% line and load regulation
- Current limit: Preset at 105% of rated current and adjustable from 60% to 110%
- Charge characteristic:
  - Constant voltage, current limited, multi-rate
- Charge mode control:
  - User selectable float, timed equalize or battery-interactive automatic equalize modes
- Standard output filtering: 12, 24, 48V: 30 mV rms on battery 4 times AH of charger’s amp rating; 100 mV rms without battery
  - 110, 120, 220, 240V: 1% rms on battery; 2% w/o battery
- Optional output filtering: 110, 120, 220, 240V: 30 mV rms on battery; 100 mV rms w/o battery (110, 120 V units); 200 mV rms w/o battery (220, 240 V units)
- Dynamic response:
  - On battery, output voltage remains within 5% of initial voltage with step load current change 20% to 100% and 100% to 20%. Recovery to within 1% of steady state voltage within 200 milliseconds.
- Battery eliminator operation:
  - Operates in stable fashion without battery. Contact factory for advice on use with constant power loads, such as inverters, without battery
- Temperature compensation: Enable or disable. Remote sensor optional. Two slope programs
- Reverse polarity protection:
  - Audible warning, internal diode, DC circuit breaker
- Parallel operation:
  - Active load share maintains output currents within 10% of each other
- Output protection:
  - Current limit, 2-pole circuit breaker, transient voltage suppression

**User interface, indication, alarms and controls**

- Voltmeter display
- Ammeter display
- Charging mode selector
- Equalize timer setting (hours)
- Status and alarm indicators

**Standard temperature compensation**

Chart shows a float setting of 2.26 volts per cell. Users can select either of two generally accepted temperature compensation (TC) curves, or disable TC if desired. The remote TC probe is optional, and can be connected anytime.
Digital metering
Large digital LCD displays for output volts and amperes, +1% accuracy

Status indication
LCD indicators for AC good, float mode, equalize mode, equalize time remaining, temp comp active, overtemp limiter active

Alarm indications
LCD indicators plus Form C contacts for AC fail, low DC volts, high DC volts, charger fail, overvoltage shutdown, ground fault

Alarm contacts rating
2A at 26 VDC, 0.5A at 120 VAC, resistive. Higher current alarm relay optional

Equalize control
Front panel selector for float, automatic or time limited equalize mode. 12 to 72 hour selectable time limit in any equalize mode

System test mode
User selectable exercise of display or remote contacts

Output voltage adjustments
Separately adjustable float and equalize voltages

Low voltage alarm adjustments
3 pre-programmed levels

Overvoltage alarm
11 pre-programmed levels

Selective overvoltage protection
Latching shutdown 4% above overvoltage alarm, transient protected and fully independent of charger control system. In parallel charger systems only the charger responsible for the fault is shut down

Environmental
Operating temperature
-40°C to +60°C, with full output available to +50°C (+45°C in 100 and 150A units)

Overtemperature protection
Gradual current reduction to maintain safe power device temperature. Current limit drops to zero amps at about 90°C ambient.

Storage temperature
-40°C to +85°C

Humidity
5% to 95%, non-condensing

Seismic compliance
Tested compliant to UBC Seismic Zone 4

Transient, RF, ESD immunity
To ANSI/IEEE C62.41, Cat. B; ANSI C37.90a; EN50082-2 heavy industrial

Agency compliance
Safety
C-UL listed to UL 1012; CSA standard 22.2 no. 107.2-M89
CE: 50/60 Hz units DOC to EN 60335

Agency marking
60 Hz: C-UL listed
50/60 Hz: C-UL listed plus CE marked

EMI
FCC Part 15 Class A; EN 50081-2

Other
NFPA-110 compliant alarm system
NFPA-70 compliant

Mechanical/construction
Housing
CR steel. Cleaned and electroplated, then painted with electrostatically applied and baked polyester compound. Standard wall mounting brackets field configurable for 19” (size E1) or 23” (size E2) relay racks. Brackets reversible for relay rack mounting. Size E2 also available with floor mount brackets

Damage prevention
Fully recessed display and controls. Seismic zone 4 tested

Electrical connections
Compression terminals

Cooling
Dual Path convection cooling delivers unheated air to life-critical components

Printed circuit card
Surface mount technology, conformal coated

Housing size E1
Wall mount configuration

Housing size E1
19” relay rack configuration
Optional features

Input
High interrupt AC breaker
Mounting
Remote temp comp sensor
Drip shield

Optional input voltages as listed under AC input
65 KAIC rating available in most units
Floor mounting for housing size E2
Recommended where battery and charger are in different temperatures
Protects from dripping water to IP22

Modular design minimizes discrete wiring, increasing reliability

A Filter capacitors, circuit boards, breakers isolated from warm magnetics and power semiconductors
B Non-heated airflow over filter capacitors, circuit boards and breakers
C Generous convective airflow through magnetics and power semiconductors allows operation to +60°C
D Modular assemblies remove for easy service
E Fully recessed controls and breakers prevent damage

### Housing dimensions

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<thead>
<tr>
<th>Housing</th>
<th>Width</th>
<th>Depth</th>
<th>Height</th>
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<tbody>
<tr>
<td>E1 - wall mount</td>
<td>19.00&quot; (483 mm)</td>
<td>16.00&quot; (406 mm)</td>
<td>15.75&quot; (400 mm)</td>
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<td>E1 - rack mount</td>
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<td>E2 - wall mount</td>
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<tr>
<td>E2 - free-standing</td>
<td>21.20&quot; (538 mm)</td>
<td>15.50&quot; (394 mm)</td>
<td>31.70&quot; (805 mm)</td>
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### Housing size E2
- Wall mount configuration
- 23" relay rack configuration
- Free-standing configuration
## Ordering information

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<th>Output Amps</th>
<th>Model</th>
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<th>Input Current²</th>
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1. Field selectable 60 Hz input standard. Optional voltages and frequency as described under “AC Input” below.
2. Input currents are shown for voltages listed in table.

### ECU is the smart charger that delivers mission-critical reliability

**Additional information**

Contact SENS or your local sales representative for additional specification, engineering and installation information. Check the SENS web site for latest available data. Specification is subject to change without notice.

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**Contact information**

For information and service on any SENS product, please contact us at:

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