V-Force Chargers are extremely versatile and work in harmony with industrial batteries to deliver reliable, long-lasting power to fuel your operations.

Versatile Design, Rugged Construction
Extends Battery Life by Years
100% Rated Multi-Shift Charger Charges Batteries in Eight Hours or Less
10-Year Limited Warranty

V-Force Chargers are extremely versatile and work in harmony with industrial batteries to deliver reliable, long-lasting power to fuel your operations.
Versatile Industrial Chargers for Every Application.

The V-SCR Series uses Silicon-Controlled Rectifier technology to quickly and accurately charge industrial batteries. A properly charged battery will prevent damage to your lift truck’s electrical systems, and at the same time extend the life of the battery by years. This multi-shift charger delivers a 100% charge in eight hours or less. Its rugged construction and lack of moving parts lowers maintenance costs. The built-in safety features, combined with a 10-year limited warranty, deliver peace of mind. V-Force provides a streamlined solution with chargers that work in cold storage or high heat environments. V-Force offers versatile chargers for every application.

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Designed to Maximize Battery Life

The IIE (constant current - constant voltage - constant current) charge profile reduces the amount of heat generated during the entire charge cycle. Notably, the critical gassing voltage is tightly controlled at the battery terminals (within ±0.5%) during the constant voltage stage. This minimizes the battery-damaging heat during each and every charge. It also keeps the battery from developing a memory due to sulfation.

Charge termination by dV/dt (change in voltage over time) prevents the battery from over and under charging. This termination mode forces all acid from the battery plates, significantly reducing the metal grids corrosion.

AC failure recovery enables the charger to resume charging from where it left off, instead of having to start the charge cycle all over again which prevents battery damage.

Safety Features

Each V-SCR charger features automatic start and stop. A five-second delay at start up prevents exposing the operator to electrical hazards. The entire exterior of each V-SCR cabinet is grounded to avoid the potential for electric shock. Protective timers monitor the duration of each stage in the charge cycle as well as the overall charge duration. These timers will automatically stop charging damaged batteries, instead of blindly pumping power into them, like some other chargers. The self-monitoring control card will also stop the charge automatically if any critical voltage or current threshold is exceeded. The prominently displayed stop button will stop the charge completely, and only by first disconnecting and then reconnecting the battery will the V-SCR charger start charging again.

Reducers Energy Costs

With an initial start rate 20% lower than the typical Ferro charger, the V-SCR series V-Force charger provides electrical savings by keeping peak load demand to a minimum. The charger also has a built-in adjustable start-up delay timer so charging can take place at times when off-peak hour electricity rates are in effect, providing versatility and potential cost savings for your operation.

Rugged Construction

This nearly maintenance-free charger contains no moving parts. The solid top construction prevents spills and liquids from damaging the charger accidentally. The hinged door makes for easy access during installation and service. This all adds up for a long service life.

Versatile Design

Sealed or flooded lead acid batteries can be charged, regardless of its depth of discharge. It is possible to utilize existing wiring in your facility to save on installation expenses by taking advantage of the field-adjustable AC input at popular voltages (480/240/208). In applications where opportunity charging is required, the V-SCR charger is up to the task. By simply changing a few settings you can charge batteries in the opportunity profile mode. V-SCR chargers also work in any environment, be it cold storage or high heat.

Warranty

10-year transformers and power semi-conductors, 5-years parts, 1-year parts and labor

Note: Fuses are not warranted.
**SCRs** Allow for accurate and controlled charging of the battery.

**Transformer** Provides electrical isolation between the AC input and the DC output.

**Control Card** Generates the signals to open and close the SCRs, updates the LED lamps, and stores customer settings.

**Fuses** Both the AC input and DC output are protected by fuses.

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**V-SCR**

- **Start (Stage 1)** Performs a five minute voltage test to see if the battery needs charging. This prevents unnecessary charging of the battery, and increases battery life.

- **(Stage 2)** V-SCR constant initial charge rate returns the optimum amount of power back to the battery while minimizing heat build-up. This constant power is also critical to maximizing the life of high acid and older batteries.

- **(Stage 3)** During transition from initial to finish charge rate, the V-SCR charger monitors and maintains battery voltage at a constant rate, which reduces heat build up.

- **(Stage 4)** During finish rate the constant charge forces all acid out of the plates until the battery is fully charged. This is critical for high-acid batteries and older batteries to maximize daily run time and total battery life.

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**Ferro**

- **Start (Stage 1)** Most Ferro chargers fail to perform a voltage test. They will begin charging fully charged batteries unnecessarily resulting in decreased battery life.

- **(Stage 2)** Ferro charger’s 20% higher initial start rate will increase the customer’s peak demand rate, which can significantly increase the cost of electricity.

- **(Stage 3)** Tapering off of initial charge rate ignores the special needs of high-acid and older batteries. During transition from initial to finish charge rate, Ferro will cause a sharp climb in battery voltage and heat up.

- **(Stage 4)** Tapering finish rate fails to force all acid out of the battery plates preventing a full battery charge. This shortens battery run time and causes long term deterioration of the grid and premature battery failure.

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**Charging Profile Comparison**

<table>
<thead>
<tr>
<th>Amps per 100 amp-hours</th>
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</thead>
<tbody>
<tr>
<td>17</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>1</td>
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</tbody>
</table>
V-SCR Charger Specifications

**Indicator Lights**

- **Charging**: stays on throughout the charge cycle.
- **80% Charged**: on during Stage 3 (constant voltage) and Stage 4 (constant current).
- **Charge Complete**: flashes during the post-charge cool down then remains lit.
- **Equalize**: lights when an equalize charge is scheduled; flashes during an equalize charge.
- **Fault**: on when a fault is detected due to either the battery or the charger.
- **Delay**: on when the start delay timer is activated.

**Input Voltages**

480/240/208 Volts AC

**Field-Selectable**

Sealed or Flooded Batteries

**Single Phase Charger**

- 24 Volt - AMP Range 475-865
- 36 Volt - AMP Range 600-750

**Three Phase Charger**

- 24 Volt - AMP Range 475-1050
- 36 Volt - AMP Range 750-1200
- 48 Volt - AMP Range 750-1050

**High Rate Current**

15.5 ± 0.5 ADC per 100 Ah

**Gassing Voltage**

2.37 VPC ± 0.5% or 2.40 VPC ± 0.5% as measured at the battery terminals

**Finish Rate Current**

- 5.0 ± 0.3 ADC per 100 Ah for flooded cells
- 3.0 ± 0.3 ADC per 100 Ah for sealed cells

**Maximum Voltage**

- 2.70 VPC ± 2% for flooded cells
- 2.55 VPC ± 2% for sealed cells

**Operating Temperature**

32°F to 104°F (0°C to 40°C)

**Storage Temperature**

14°F to 140°F (-10°C to 60°C)

**Enclosure**

NEMA 1

**Cooling**

Convection

**BCIS-16 code**

100D6C8

**Third-Party Industry Standards**

UL1564
SA 107.2
BCIS-16
NEC and CEC

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**LED Display**

**Charging Characteristics**

- **Stage 1**: (18 Amps) Performs a five-minute voltage test to see if the battery needs charging.
- **Stage 2**: (93 Amps) Delivers a constant current high-rate charge until the battery reaches 80% of capacity.
- **Stage 3**: (93 -18 Amps) Maintains a constant voltage during the gassing phase as the current falls.
- **Stage 4**: (18 Amps) Tops off the battery with a constant current to bring it to full charge.

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Note: Currents shown for the LED display stages depend on the size of the battery. Currents for 600 amp-hour sealed battery shown.

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Because V-Force is continually improving its products, specifications are subject to change.

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