



President's, Message...

It's been a while since we published the Kussmaul Times; we hope you enjoy the new format and information content.

This is my first newsletter writing to you as President. I was handed the reins when Ernie Kussmaul, who founded the company 47 years ago, sold the business in 2011. Many of you are acquainted with Ernie and will be pleased to know he still is active in the company and comes in nearly every day to assist in engineering projects.

I've been fortunate to be associated with Kussmaul Electronics for 30 years and now have the responsibility to guide the company into the future with the view of constant improvement in customer service, new product development and leveraging the talents of our staff to the ever-changing needs of the market. Customer satisfaction is our goal and I encourage you to contact us with your comments and suggestions on how we can better serve your needs.

The future of the company is bright and I'm excited to be leading so many talented people. You can look forward to each quarterly issue of the Kussmaul Times for updates on the pulse of the company.

Thomas H. Nugent

The 80 LPC, Our Newest Charger

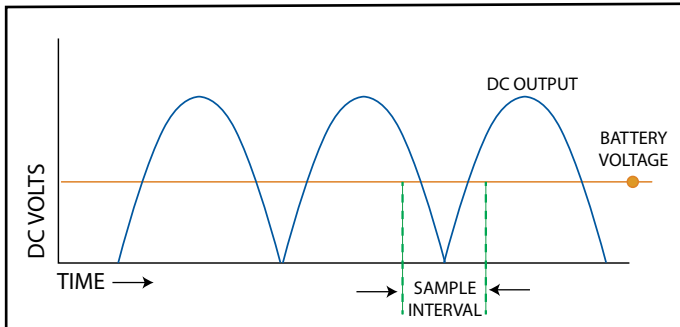
This latest addition to the Low Profile Charger series produces 80 amps yet is only 4" high, fitting easily under seats, or occupying minimal space in compartments.

The 80 amp charge rate quickly restores batteries and eliminates discharge due to parasitic loads. The clean output poses no interference with radios, and a 15 amp auxiliary circuit powers air compressor pumps, charges hand lights and handheld radios. A Remote Bar Graph Display is provided as standard. Alternatively a Digital Status Center in a watertight case is available.

Recent installations include a high use heavy rescue with large DC loads, and a police command trailer with 65 amps of DC power draw. Both required a high capacity charger, and the 80 LPC did the job.



Proper Battery Charging Achieved by Patented SAMPLE & HOLD Circuit

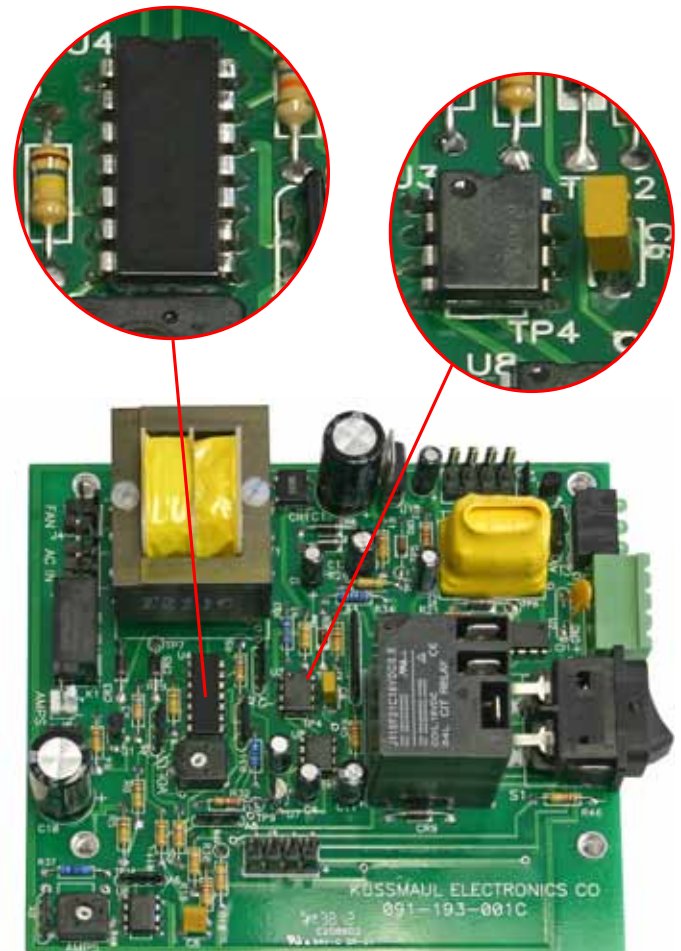


During the sample interval when no current is flowing to the battery, the charger's sense circuit obtains an accurate reading of battery voltage, holds that value and adjusts output precisely to maintain proper charge level.

All Kusmaul chargers are automatic and thus charge the battery "on demand". This is accomplished by the charger's output being controlled by sensing the battery voltage. Charger output continues until "full charge voltage" is sensed and then charging stops. Controlling the charger by sensing precise battery voltage is thus critical to properly charging the battery, otherwise over or under charge occurs. The charger "reads" the battery voltage via its output wires, however, since the wires connecting the charger to the battery have some resistance, the sensed voltage may not be precise. The error is dependent upon the wire resistance and the magnitude of the charger output current. A specialized "sample and hold" circuit, patented by Kusmaul Electronics, has been incorporated in many of our chargers to eliminate this error.

Here's a brief explanation of how the circuit works: Charger output current is D.C., direct current, created by rectifying the alternating current obtained from the utility power line. The rectified voltage varies, continuously rising from zero to a maximum and returning to zero 120 times per second (See diagram). In order to obtain the precise battery

voltage the circuit "samples" the battery voltage during that brief interval when the output current is zero, at that time there is no voltage drop in the wires and the precise battery voltage is measured. The measured value is "held" as a reference point that then controls charger output. By utilizing the "sample & hold" circuit the true battery voltage controls the charger and assures that the battery is correctly charged even with a parasitic load. Parasitic loads, i.e. accessories that draw constant current from a vehicle's battery, tend to lower the voltage of the battery. The "sample and hold" battery sensing and control completely compensates for the discharge caused by parasitic loads, maintaining batteries in the fully charged condition.



Patented SAMPLE & HOLD Circuit

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Heavy Duty Solar Charging Systems

- 5-15 amps supplemental DC power
- Industrial grade panels & mounts
- Sizes to match available roof space
- Complete kit: panel, solar controller, wiring with water tight fittings, and all necessary installation hardware.

**Make your “Green”
trucks even Greener!**



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