

# MCC Microcomputer Charger Control

## for Lead-Acid, Flooded (non-sealed), Motive Power (traction) Battery Chargers

### FAQs - Frequently Asked Questions

#### *What does a charger control do?*

The primary function of the charger control is to turn the charger off when the battery is fully charged. It also may perform several other functions such as delayed start and periodic equalizing. The charger control does not control the dc output of the charger -- that is a function of the charger's design and adjustment (tap selection).

#### *Why replace a timer control?*

Timer controls have no way to calculate or know when the battery is fully charged. They operate by guesswork and usually overcharge.

Industrial truck batteries normally wear out from charging. They require a recharge of about 105% of the ampere-hours withdrawn to make up for internal losses and reach full charge. Normal wear from charging is unavoidable. Excessive wear from under- or over-charging is avoidable.

#### *Why use a MCC?*

MCCs monitor the voltage curve up to the 80% charge point, compare this to an algorithm in the software program, and then compute how long the finish charge should last.

MCCs are automatic, accurate, easy to install, simple to use, have a long track record (in production since 1980), carry a 5-year warranty in normal use, and will replace the control of most flooded-battery chargers.

#### *What is the 80% charge point?*

The 80% charge point is when the battery has been recharged to 80% of its rated capacity. At this point the battery begins to gas -- excess electric energy that the chemical reaction cannot absorb decomposes the water of the electrolyte into hydrogen at the negative plates and oxygen at the positive plates. The charge voltage at this point is approximately 2.38 volts per cell. The charge up to the 80% charge point is referred to as the "Initial Charge." The charge after reaching the 80% charge point is referred to as the "Finish Charge."

#### *Can I use the MCC on a VRLA (Valve Regulated Lead-Acid) battery charger?*

No. MCCs are for flooded-battery chargers. VRLA chargers have specialized profiles for VRLA batteries. Their control boards handle more than just automatic start/stop.

#### *Can the MCC be used for charging cold-storage batteries?*

If the batteries being charged are to be used in a cold-storage environment, the MCC should be adjusted by the factory for that use. Specify this when ordering, or consult Arrgh!!

*Does the ac voltage of the charger matter?*

Normally, no. The MCC is powered by the dc from the battery. If, however, the charger's incoming ac voltage is greater than 480 volts ac, the charger must have a control voltage transformer to lower the voltage to the coil of the line contactor (relay).

*Does the charger need a line contactor (relay)?*

If the charger draws more than 10 amps ac, it needs a line contactor. Without a line contactor, high current will damage the small relay inside the MCC.

*What MCC models are available?*

MCCs come in either "automatic equalize" or "manual equalize" models.

*What is equalize?*

Equalize is an extended low-rate finish charge for one to six hours. Normally, it is given once a week or every 7th. charge. It is necessary, especially in an older battery, to keep the battery healthy and fully charged. The cells of the battery are similar but not exactly equal -- they have slight variations in active material. The equalize charge insures periodically that all cells are brought up to full charge.

*Which MCC model should I use - automatic equalize or manual equalize?*

Automatic equalize is best for operations where the battery is left connected to the charger over the weekend. After the regular charge is finished, if the battery is left connected to the charger for 18 hours, the charger will turn back on and give the battery an equalize charge. With this model, the operator does not decide when to equalize the battery, and the battery has time to cool down and stabilize before the equalize charge.

In operations where the battery may not be left connected to the charger for 18 hours after the regular charge is finished, the manual equalize model should be used. If you press the manual equalize button during the regular charge, the battery will receive an equalize charge immediately following the regular charge. The operator needs instruction on how often to equalize the battery. Note: the manual equalize model functions as an automatic equalize model if the manual equalize button is not pushed.

*What dc voltages are available?*

MCCs from 12 volts dc to 250 volts dc are available.

*Is the MCC voltage specific, or universal?*

MCCs are voltage specific. The voltage rating of the MCC must match the charger dc output voltage rating. For example, automatic equalize MCCs are designated as MCC-12 for a 12 volt battery charger ( manual equalize units are designated as MCC-EQ-12 for a 12 volt battery charger ). Note: some chargers are labeled for the number of cells they are designed to charge. The numerical designation of the MCC is for the nominal dc output of the charger, not for the number of cells of the battery.

*What charging options are available?*

If you unscrew the cover of the MCC, you will see a 10 position rotary switch. It is set on position "O" at the factory for normal, no-delay charging. Positions "1 to 6" are for delayed start. Position "7" is for opportunity charging. Position "8" is for maintenance charging. Position "9" is for factory test.

*How does “delayed start” work, and what are the advantages?*

Positions “1 to 6” are for a delayed start of 1 to 6 hours in one hour increments. Delayed start allows the battery to cool down before charge and permits charging during off-peak hours, saving on the cost of KWH’s. It also may deter boost charging that can shorten the life of conventional flooded batteries. When delayed start is selected, the INITIAL CHARGE LED will flash when the battery is connected until the selected time delay is reached. At that time the INITIAL CHARGE LED will change to steady and the charger will turn on. You can override the delay and start the charger by pressing the STOP button. Minimum charge time is 60 minutes.

*What is “opportunity charging” and when should it be used?*

Position “7” is for opportunity charging for light duty or intermittent applications such as airline baggage handling, where the battery is only partially discharged before recharging. Minimum charge time is 10 minutes (minimum charge time normally is 60 minutes). This position should not be used for regular use where the battery usually is discharged below the 80% full charge point.

*What is “Maintenance Charging” and when should it be used?*

Position “8” is for maintenance charging. This is useful during plant shutdown or when the battery is left unused for a long period of time. If the battery voltage drops to the equivalent of 80% of full charge, the charger will turn on, bring the battery back to full charge, and then turn the charger off until the battery self-discharges again. When maintenance charging is selected, the CHARGE COMPLETE LED will flash when the battery is connected. If the battery voltage falls to the 80% charge point, the FINISH CHARGE LED will light and the charger will start. When the charge is complete and the charger turns off, the CHARGE COMPLETE LED will resume flashing.

*What do I do if the battery is continually undercharged?*

If the battery seems continually undercharged, first check the battery. If you have a manual equalize model MCC, press the equalize button during charge to give the battery an equalize charge. If you have the automatic equalize model MCC, wait until the battery has been equalized over a weekend. Check the specific gravity of the cells. If the specific gravity is low (it will read a little low immediately after charge until the electrolyte disperses and stabilizes), reconnect the battery to the charger - the charger will run for an additional hour. If the specific gravity of the cells will not reach 1.185 or higher according to specs, and/or the difference between cells remains greater than 15%, the battery has a problem.

If the specific gravity is normal after the equalize charge, but the battery is undercharged by regular charging, the finish rate of the charger may be too low. If possible, increase the charger’s finish rate (see the charger’s instruction manual). If unable, you could raise the calibration point of the MCC slightly (consult Arrgh!!). It would be better, however, to replace the charger with one of proper size.

*Can I install a MCC myself?*

The MCC has four wires. The black and red wires attach to the charger’s output cables to the battery -- black to negative and red to positive. The other two wires are spliced into one of the wires that go to the coil of the line contactor. If you are experienced or confident in making these connections, you should be able to install the MCC yourself.

*When I connect a battery, the Initial Charge light turns on steady but the charger does not start -- Why?*

When a battery is connected and the Initial Charge light turns on steady, the internal relay should close and there should be continuity between the MCC's two white wires. If there is continuity, the white wire connections to the line contactor's coil probably are incorrect; if there is no continuity and battery voltage is at least 1.5 volts per cell, the internal relay circuit of the MCC has been damaged and the MCC should be returned to the factory for service.

*When I disconnect the battery during charge, without pushing the STOP button, my charger does not turn off -- Why?*

The MCC did not see a sufficient voltage change to indicate that the battery was disconnected. The sensitivity of the MCC to rapid voltage change can be adjusted if necessary. See the Installation & Operation Instructions for details.

*What is the warranty on MCCs?*

MCCs up to and including 128 volts, unless used in mining or other corrosive environments, are warranted to be free of defects in workmanship and materials for a period of five (5) years. Higher voltage and harsh environment units are warranted for one (1) year. Warranty is limited to MCC repair or replacement, at Arrgh!!'s option.

*Where can I buy a MCC?*

You can buy a MCC from one of our dealers. Contact Arrgh!! for the name of a dealer near you.