



TecMate's chargers: technical terms simply explained.

Battery Resistance: A large battery has less resistance than a smaller battery of similar construction if both are in the same condition or status. A fully charged battery has higher resistance than the same battery part-discharged. A deep-discharge or sulphated battery has very high resistance & is therefore extremely difficult to recharge again. Think of men eating: a really big man eats more & can eat faster than a small kid. A big man who is really hungry will eat even faster. But the same man lost in a desert for a week or so might be very hungry indeed but cannot swallow due to a swollen closed throat. Constant voltage ("logarithmic") chargers cannot recharge such "closed throat" batteries. But constant current chargers often can because the voltage they apply rises automatically in response to the battery's resistance. Constant voltage charging is however useful for the absorption & maintenance of "float" stages, see below, when the battery is already sufficiently charged to start the engine.

Constant Current: the first & main stage of the charging program, during which the current stays constantly at or very close to the stated rated value for the relevant model. Think of this as the "boost" stage. TecMate chargers do maintain a constant "boost" stage current, unlike most competitors.

Constant Voltage: when applied to chargers, "Constant Voltage" means that the voltage at which the battery charger delivers current to the battery is held at a stated value, and the current passed into the battery varies according to the battery's internal resistance, falling progressively with time as the battery's internal resistance against further current input rises. (This progressively decreasing charge current is also known as a "logarithmic" charging characteristic, and is often the sole charging stage of most common chargers).

Absorption stage: Where the Constant Current stage can be thought of as the "boost" stage, the Constant Voltage absorption stage can be thought of as the "fill" stage. The voltage gradually rises during the constant current charging stage as the battery recovers its charge. When the battery is about 75 to 85 % fully charged (75% for small motorcycle batteries, 85% for larger automotive batteries) the voltage reaches the 14.3V or 14.4V level (14.7v for gel DC, 16 to 16.9V for MF) at which prolonging the constant current stage would risk gassing the battery, so the charge voltage should now be limited at this level or less. This second stage of charging is called the "absorption stage" because it allows the battery to absorb further current according to its need before passing into the

medium to long term maintenance stage (float charge mode). In practice the absorption stage continues (the voltage being limited at 14.3– 14.4V) until the current absorbed by the battery at this voltage has fallen to one sixth of the “boost” stage to ensure a thorough charge replenishment. Automotive & truck batteries which have discharged significantly might need several days connection to a maintenance type charger before reaching the float charge stage.

Float Charge Mode: When in absorption stage the current absorbed by the battery has reduced to one sixth that of the “boost” stage the green LED indicates that the battery is now (close to) fully charged & ready to use. The voltage limit is now automatically reduced to 13.6 – 13.7V for medium to long term maintenance of the battery without gassing. The battery can draw current according to need to support small loads (or current leaks in the vehicle wiring circuit) varying from zero to up to one sixth of the “boost” stage. The AccuMate & AccuMate PRO charging circuits can revert to the absorption stage if their monitoring circuits find that the battery needs more current to maintain its charge than is available in float charge mode. See below for more details.

Standby feature: This is a special feature of the AccuMate & AccuMate PRO circuits! During the float mode these circuits continuously monitor the current drawn by the battery. This is especially important when the battery remains connected within a wiring system, whether those of a vehicle or of a power support system. For example “collectors’ classic automobiles” may well still have their original wiring whose insulation is deteriorating & whose electrical contacts may have become corroded or loose, thus giving rise to “leaks” of current in the system and consequently rapid or sudden battery drain.

Fully Interactive: the current the battery needs to support such leaks or loads may rise right up to the limit allowed in float mode. Should AccuMate monitoring circuit sense this, the green LED goes out, the yellow LED comes on again, & the circuit reverts automatically to its “boost” stage which allows up to the full charge current to the battery as required until once again near fully charged, when the Absorption Stage will follow until the green LED once again replaces the yellow LED as the float mode is once again attained. This **fully interactive** characteristic is what distinguishes the AccuMate & AccuMate PRO as the ideal medium term charger-maintainers for collectors’ oldtimer vehicles.

Thermal Protection: AccuMate & AccuMate PRO have an **NTC Thermistor** to monitor internal temperature & reduce output current if conditions become too hot through ventilation blockage or extreme ambient temperature. AccuMate PRO has a built-in cooling fan which diverts air away from its thermal ambient sensor which varies charging voltage settings. Both also have thermal fuses in the transformer.