

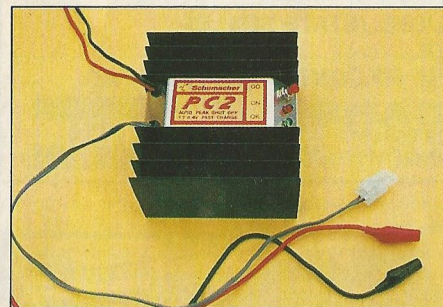
The Schumacher Chargers

RRC takes a look at the complete line up

The subject of battery charging can sometimes give rise to quite heated debates amongst electric racers, as no two people seem to agree on either the best type of charging method to use for the different types of cells, and the charge rate (in amps) that is the best for the cells in terms of performance, allied with keeping the cells in good condition for as long as possible!

There are basically two methods of charging model car racing packs: (A). Constant Current (Linear) charging, and (B). Pulse Charging, which can be sub divided into 'hard' and 'soft' pulsing. Modern technology has proved that the 'soft' pulse method is much easier on the cells we use for our racing, giving them a longer useful life, so the 'hard' pulse method is now regarded as obsolete. Allied with the actual type of charge delivered to the cells, the method of detecting when the battery pack is fully charged can also be divided into two methods (at least for the purposes of this review. 'Slope' chargers are also available that can be pre set to cut off at differing levels of 'voltage drop' to suit particular types of cells as they go into an overcharge situation.). The 'peak' detection method seems to work very well with cells used for 1/12 racing such as Panasonic P-170s in conjunction with a 'linear' mode charge, while for Sanyo 1400 SCRs, 1700SCRCs and Yuasa 1700SCKR cells the 'temperature' method is accepted by many as the correct way to get the best from these cells, together with a 'soft' pulse for maximum punch. As I said earlier, no two racers agree on the subject of charging methods, but whatever your preference, Schumacher have a charger to suit your needs!

The P.C.2. Auto Peak Charger



The P.C.2 Auto Peak Charger with effective heat sinking

The PC2 is the least expensive charger in the Schumacher range, and gives a constant current (linear) charge to the cells, coming factory set to charge at 5 Amps which is a good average rate to use with SCR type cells. This type of unit is really aimed at the beginner or younger racer, who wants a charger that will charge his/her cells at the touch of a button without too much hassle. It is possible to adjust the charge rate to make the PC2 more suitable for SCE type cells by taking the case off the unit, although Schumacher recommend that this is done as little as possible; in other words choose a charge rate and stick to it!

Using the PC2 is simple, as once the red and black croc clips have been connected to the 12v battery used as the power supply, the green light will come on, signifying that all is well. The cell pack is then connected (Tamiya compatible connector already fitted). The green light should stay lit if the pack is suitable for fast charging. The start button is then pressed, illuminating the red light and beginning the fast charge.

A fully discharged 6 cell pack of 1400 SCRs will then take between 20/25 minutes to charge. The cut off point was tested with a DVM, and was found to be reliable in that it didn't 'go over the top' by more than .07v, which let the cells warm up nicely ready for use without over doing it. The cells then receive a trickle charge of 100ma until they are re-peaked before the race by pressing the start button again. The very large heatsink becomes barely warm whilst the charger is in use,

another feature that goes to make this unit a popular choice for the younger driver.

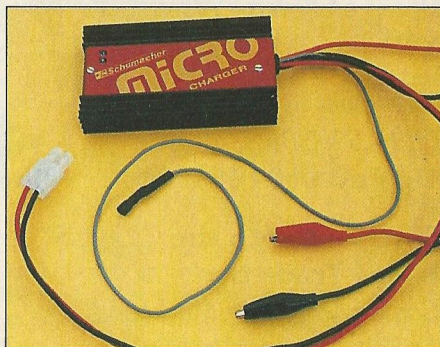
Specification:

Size - 58 x 100 x 107 mm.
Charge current - 5 Amps (factory set).
Power Supply - 12 volt battery.
Number of cells - 6/7 (7.2-8.4v).
Cut off detection - Delta Peak voltage.
Trickle charge current - 100ma.
 Croc clips and Tamiya compatible connector ready fitted.

The Micro Range



The Micro Peak charger.



The Micro Temp Charger- note the black sleeved temperature probe.

The Schumacher Micro 'Temp' and the Micro 'Peak' Soft Pulse units are the latest in the range

to come onto the market. The amperage rate at which these compact units (16 x 60 x 102mm inclusive of heat sink) charge the cells is pre set, and cannot be adjusted by the user, but this should prove to be of benefit to the majority of the racers for which, at a guess, these chargers are aimed at, ie the younger end of the market.

Both chargers have 10 bit Digital accuracy, with a microcomputer, temperature stabilised A/D converter to make all the measurements. Both units use the 'Soft Pulse' mode of operation, which has been found to not only give the cells more 'punch', but can also allow the repeated use of a pack during the course of a race meeting without the cells 'going off' and losing their performance, very useful if using 1700 SCE type cells.

Specification:

Number of cells - 4/7 (7.2-8.4v 1.2 to 2.0 AmpHr).
Charge Pulse - 13 Amps max @ 10Hz.
Soft start current - 2.0 Amps.
Fast charge current - 4.25 Amps average.
Trickle charge current - 120 ma average.
 Full reverse connection/short circuit protection.
Charge detection - Micro Peak Charger uses 'Delta' Peak method. Micro Temp Charger uses Temperature Probe to detect rise or differential in temperature of cells of 8°.
 Charge is also terminated if the pack temperature exceeds 45°C.

Both chargers are actually identical in operation, the only difference being the method of detecting when the pack of cells is fully charged. I tested both Micros by charging some packs for a Tamiya Stadium Blitzer belonging to the son of a friend of mine, with the Temperature type the first to be tried (the chargers come complete with a Tamiya connector fitted). None of the 3 packs ('deal' type nicads as purchased with the car) had been used for some weeks, and they had been previously charged with a 'wind up' charger.

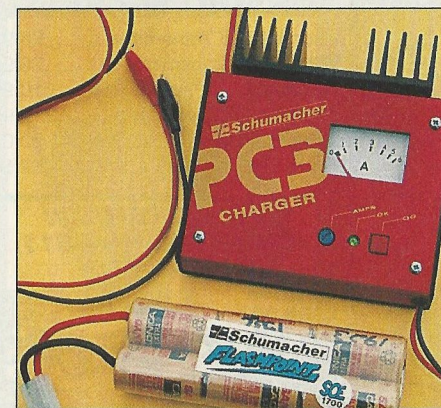
One feature of the chargers was immediately put to the test, as my friend had told me that the car didn't go very well when using one particular pack. The red indicator light came on after the pack had been connected for a short time, indicating that the pack contained a bad cell(s). This pack was consigned to the bin! The other 2 packs accepted the charge well, with the temperature probe being held against the cells by the heatshrink covering (stick packs). The initial temperature of the cells was measured with the probe from the PC5 Charger, noted, then the temperature climb was monitored until the charge was finished, to check the cut off point. This was found to be consistently .5° C out during our tests, but cut out it did!

The Peak charger was next, with the detection of the peak voltage tested with a DVM. This showed that the cut off circuitry let the voltage just start to 'go over the top', then the charge would be terminated.

The performance of the cells, and therefore the car, was noticeably improved (quite impressing my friend and his son!), so with their simplicity of use and lack of parts to fiddle with, I would recommend the Micro type of charger for the beginner wanting to charge SC or SCR cells, or for the racer that doesn't want to take his all singing and dancing job to the local indoor club

where it can take up too much of the available space. Effective, and reasonably priced.

The PC3 Peak Charger



The PC3 Linear charger with adjustable charge rate.

The PC3 is very similar to the PC2 in operation, as it charges the cells using the constant current or 'linear' method. It differs though in that the charge current is adjustable by the user from a pot mounted on the front of the attractive case, with the charge rate easily visible on the ammeter also situated on the case front face.

This unit is the first charger looked at in this review that is readily adjustable, so it can be recommended for use with different types of cells; from Panasonic P-170s that require a low rate of charge of approx 2/3 amps, to 1400SCRs that perform well having been charged at 4.5 amps plus.

Yet again, simplicity of use is a plus point, as once the PC3 has been connected to the 12v battery used as the power supply (a mains power supply can be used, but it must have a current rating of 10 amps or more, and the PC3 instructions recommend a 4,700 micro farad 25 volt capacitor be used as additional smoothing), the green light illuminates. Before the cells are connected, the instructions recommend that the current is turned down to zero, although I must admit that I didn't find it necessary to do so, then the 'Go' button is pressed to start the fast charge process. The ammeter shows the charge current, and the rate can be turned up or down while the charge is in progress, although it may be found that the unit will sometimes 'click off' having done so. Re starting is a simple matter of pressing the GO button again.

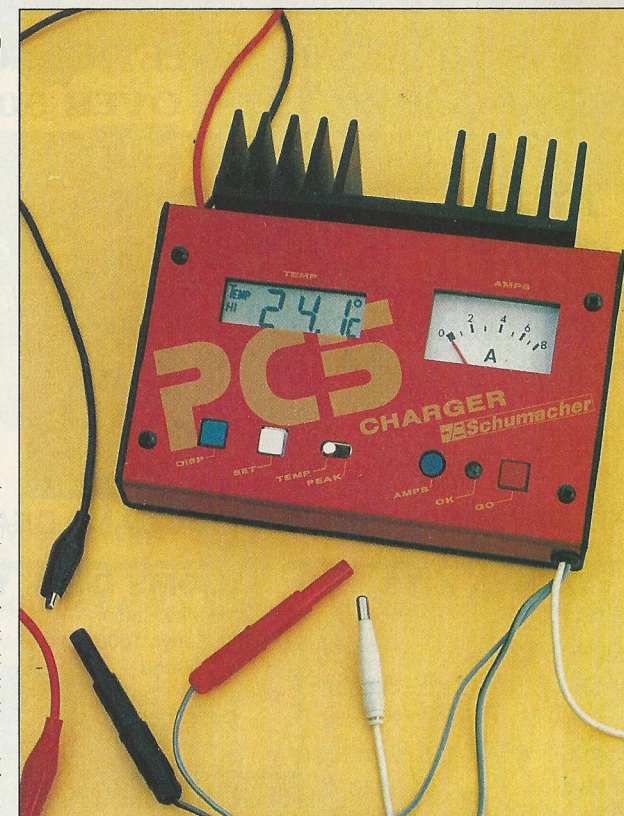
The PC3 is a very smart and professional looking charger, that should give long service due to its stout construction that will help to prevent 'pit box rash'. This could well be the charger for the 'not quite so novice' driver to buy, as the adjustable current facility and clear ammeter should prove to be quite adequate for the majority of racer's needs.

Specification:

Size - 50 x 120 x 127mm inc heat sink.
Charge rate - Adjustable to 6 amps max.
Power Supply - 12v battery or smoothed 10 amp (minimum) mains supply.
Number of cells - 4/7 (4.8-8.4v).
Cut off detection - Peak voltage.
 Full reverse connection/short circuit protection.
Trickle charge rate - 100ma.
 Croc clips and Tamiya compatible connector fitted.

The Top Of The Range PC5

The PC5 charger features both Peak and Thermal charging modes. This charger has been fitted with Wasp Racing sliding cover connectors.



The PC5 charger has actually been on the market for some time now, and has found favour with some of the World's top drivers, both for on and off road use, and for charging all of the different types of cells on the market with their individual needs. It has recently been the subject of a styling revamp, with the construction of the case and electronics remaining as per the original, but the aluminium case has now been anodised red rather than black, with the Schumacher logo and user instructions screen printed on the front in yellow instead of a sticker, so the PC5 is now a very good looking unit indeed. Mind you, the fact that it looks good shouldn't mean that it is automatically the bee's knees, but as it is the charger used by drivers like Kevin Moore, Jurgen Lautenbach and Ben Sturham to do so well with at the Reedy Race at Basildon this year, then that should be recommendation in itself!

The PC5 possesses all that is needed for charging model car racing cells in one neat package, as it features not only peak detection circuitry, but an adjustable temperature charging facility as well. The LCD display to the left of the sloping case front (powered by one HP7/AA cell) indicates the ambient temperature when the temp/peak switch is slid to the TEMP setting (this is useful for telling the temperature during those hot summer racing Sunday's?!).

The temperature probe is first put in place against the cells, either held in place with some tape or a rubber band, then the cells are connected. Setting the temperature to the desired setting is very easy, as once the DISP button is pressed and held down, the required cut off temperature can be brought up on the display by pressing the SET button. This setting must be higher than the ambient temperature, or that of the cells, otherwise the charger won't start charging! The GO button is pressed, then the charge rate in amps is set by turning the AMPS pot on the case front. This is mounted flush with the case to avoid inadvertent alteration by brushing against the case during the usual frantic pit work.

The actual cut off temperature was within .3° of the set temperature, this being checked against a calibrated digital industrial thermometer, so accuracy was nothing to worry about. Moving the slide switch to the PEAK setting brings into action the Delta peak cut off circuitry. The method of current adjustment remains as per the temperature function. Talking of temperature, I charged some 1400 SCRs at 6 amps in the office on a warm afternoon, yet the heatsink became barely perceptibly warmer, so it

is obviously very efficient.

As the PC5 has the facility to both thermal and peak charge, it is the obvious choice from the Schumacher range for the driver who wants a versatile unit that can cope with different types of cells. It is quite possible to peak charge the cells, let them have a cooling off period, then just before racing insert the temp probe and temp charge them to achieve the maximum punch from the start, thus giving the best of both worlds when used with the right cells! The PC5 is the most expensive charger in the present Schumacher line up, but for what it offers the user can be regarded as a good investment.

There you have it, the full range of chargers

Specification:

Size - 128 x 50 x 152mm inc heat sink.
Charge current - Adjustable to approx 7.5 amps.
Power Supply - 12v battery or well smoothed 10 amp (minimum) mains supply. Thermal charging is recommended when using the latter.
Number of cells - 4/7 (4.8-8.4v). Heatsink will become very hot when charging 4 cell packs.
Cut off detection - Delta Peak or Thermal.
Trickle charge current - 100ma.
 Full reverse connection/short circuit protection.
 Croc clips and Tamiya compatible connector fitted. (Wasp Racing connectors pictured).

from Schumacher Racing. They all have their individual points and are simple to use with good instructions, so whether it's the price or the features they possess that attract, you are sure of buying a proven product that, should something go drastically wrong, can be repaired economically with a fast turn around. If you are in the market for a charger, it's well worth taking a look at the Schumacher range at your local model shop!

Manufactured and distributed to the trade by: Schumacher Racing Products.

Available from all good model shops.