LA00019

pulsar 2 COMPETITION

PROFESSIONAL BATTERY & MOTORMANAGEMENT

USER GUIDE

Order No.: 41551

LRP ELECTRONIC

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Dear Customer,
Thank you for your trust in this LRP product. By purchasing the LRP Pulsar Competition 2 Charger (following called *PCC-2*) you have selected one of the most advanced battery- and motor-managment systems. The following features give the PCC-2 the distinctive advantage and will be explained later in detail:

- "Laser Blue" backlight 16x2 LC-display
- 3 pro units in one (charge, discharge, motor run-in)
- 1 to 8 cells fast charge (0.1 to 10.0A!)
- 1 to 8 cells discharge (0.1 to 10.0A!)
- Intuitive, logical navigation
- Multiprotection system (3-way protection + integrated fan)
- Memory for 3 individual user profiles
- Autostart timer from 0 to 99mins

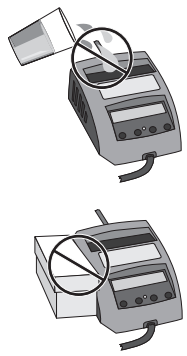
Read the complete instructions for use carefully before you start to operate the *PCC-2*. Make sure you have understood all the points.

TECHNICAL DATA

Dimensions	100 x 153 x 70 mm	Autostart Timer	0 - 99 min
Weight	600 g	Discharge current	0.1 - 10.0 A
Input Voltage	11 - 15 V	Discharge cut-off voltage	0.9 - 7.2 V
Charging Modes	Linear + Flex	Motor Run In	2.0 - 7.2 V / 14 A
Charging Capability	1 - 8 cells	Matching Mode	Yes
Charge current	0.1 - 10.0 A	Auto-Restart-System	Yes
Trickle current	0.0 - 0.4 A	Multi-Protection-System	3-way
Delta-Peak	5 - 95 mV	LCD-Display	Laser Blue
PCS-3	Yes	Buttons	4
User Profile Memory	3	Internal, programmcontrolled fan	Yes

WARNING NOTES

- Only use the *PCC-2* to charge quick-chargeable nickel-cadmium or nickel-metal-hydride-battery packs. If you try to charge other cell types (e.g. lead-acid, lithium-ion, -polymer, etc.), it may cause damage to the cells or the *PCC-2*.
- Avoid any contact of your *PCC-2* with water or other liquids.
- Never cover the cooling slots on the *PCC-2*. Only place your *PCC-2* on constant-temperature surfaces. Never place the *PCC-2* on carpets or cloths.
- Never allow the *PCC-2* to operate without supervision and never keep your PCC-2 connected to a power supply, car battery or battery pack when it is not in use.
- Only charge serial connected battery packs containing 1 to 8 cells. Never charge parallel connected cells.



- Always comply with the charging instructions of the battery manufacturers and matchers and never exceed their specifications. See 'Recommended Settings'.
- Never use a power supply with more than 15 V output voltage.
  Never try to operate the *PCC-2* directly from a 110/230 VAC power source!
  For best performance, we recommend the *LRP Powersupply* (#43150).
- Make sure you connect the terminals with the correct poalrity, on both the input and output sides! Red indicates the positive pole and black the negative pole.
- New chargers may produce a slight odor in the first few hours of service due to materials curing inside the device.
- If individual cells in the pack heat up excessively, immediately stop the charging process.

SPECIAL CHARGE FEATURES

PCS-3 (Peak Capacity System)

The voltage charge curve of NiMH cells may vary considerably at the start of charging due to cell construction. Conventional chargers interpret this incorrectly as delta peak reached and terminate the charging process (false peak). The *PCC-2* includes the updated LRP-exclusive PCS-3 which contains advanced algorithms to detect this phenomenon: This ensures reliable full charging.
PCS-3 allows the perfect full charge of all cell types by means of an adjustable delta peak and high-precision digital-filter detection of all parameters throughout the entire charging process. **Herewith temperature charging is obsolete !!!**
The *PCC-2* signals full charge and end of charge by an alert buzzer that sounds for 3 minutes at 4-second intervals.

Auto Restart System:

As a worldwide innovation, the *PCC-2* continues automatically to charge after the input voltage fails and displays the duration of the power failure if it lasted longer than 3 mins. A total power failure at races is no rarity and this feature allows you to fully charge your battery packs within the remaining time at increased charge current. The *PCC-2* keeps you informed of the length of the charge interruption. Example: "Int14min" (for 14 min interruption) is displayed in alternating sequence.

Changing the charge current on the fly:

The charge current can be changed on the fly by pressing INC+ or DEC- without interrupting the process. This change in not stored. The next time you start charging, the device takes the data settings stored under "Settings". Refer to PCS-3.

PWM Circuit:

The *PCC-2* ensures efficient charging through the use of the latest digital technology.
There are many benefits here:

a) maximum charge current even at low input voltage
b) maxium charge current already for 1-to 4-cell battery packs
c) very low heat dissipation
d) more charges out of a car battery since the charger has a higher efficiency

Autostart Timer:

This handy feature lets you preselect when you want to start the *PCC-2* for a charge session; adjustable from 0 to 99 mins. If you stay in the "Autostart Display" for longer then 30sec, without setting a value, the *PCC-2* will start charging automatically.

SETTINGS

The *PCC-2* allows to save 3 individual user profiles! This means you can customize 3 personal charge profils individually and store them for later use.

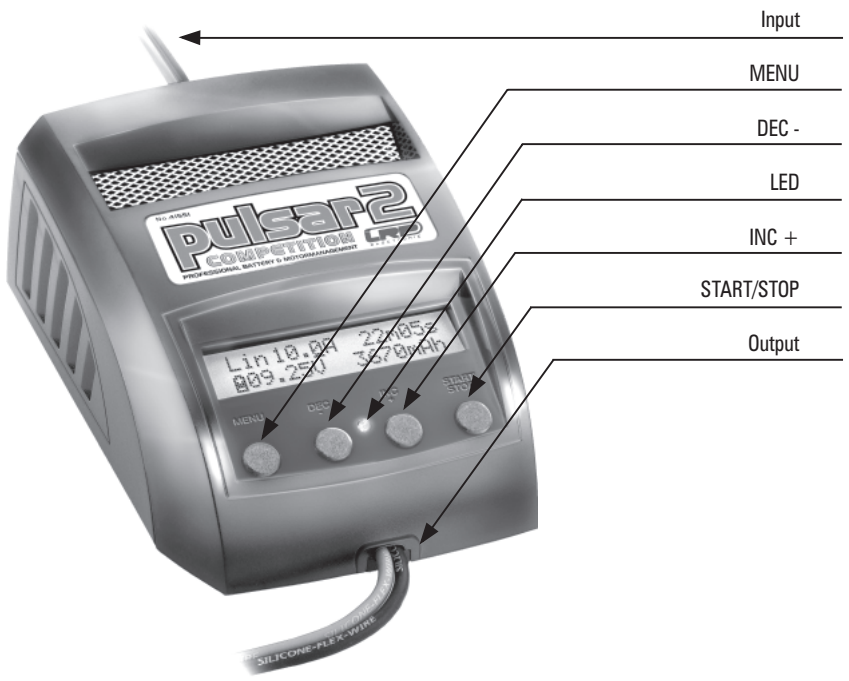
The *PCC-2* has 3 factory settings when shipped out. P1 (NiMH programm), P2 (NiCd), P3 (Receiver-/Transmitter batteries). For details see 'Recommended settings'.

The *PCC-2* indicates by displaying P1, P2, P3 in the main-menu in which profile you are. By pressing + and - you can change between the profiles and it's settings.
To reset your *PCC-2* to factory settings, proceed as follows:

- Disconnect input voltage
- Hold down MENU key while reconnecting the input voltage.

TERMINALS/DISPLAY/OPERATION

The *PCC-2* was developed with the main objective placed on easy operation of all features. Intuitive navigation by means of 4 keys makes it very easy to use and the 2-line LC display offers perfect, reliable control of all parameters.

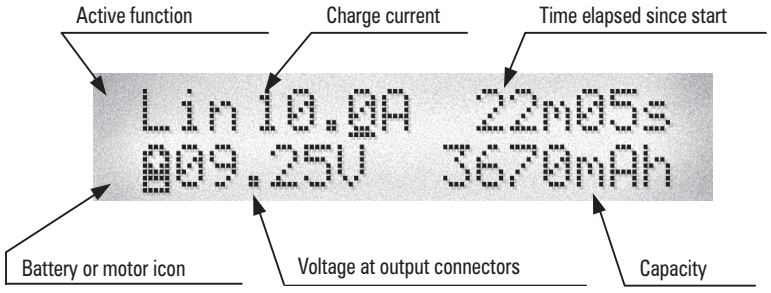


Keys:

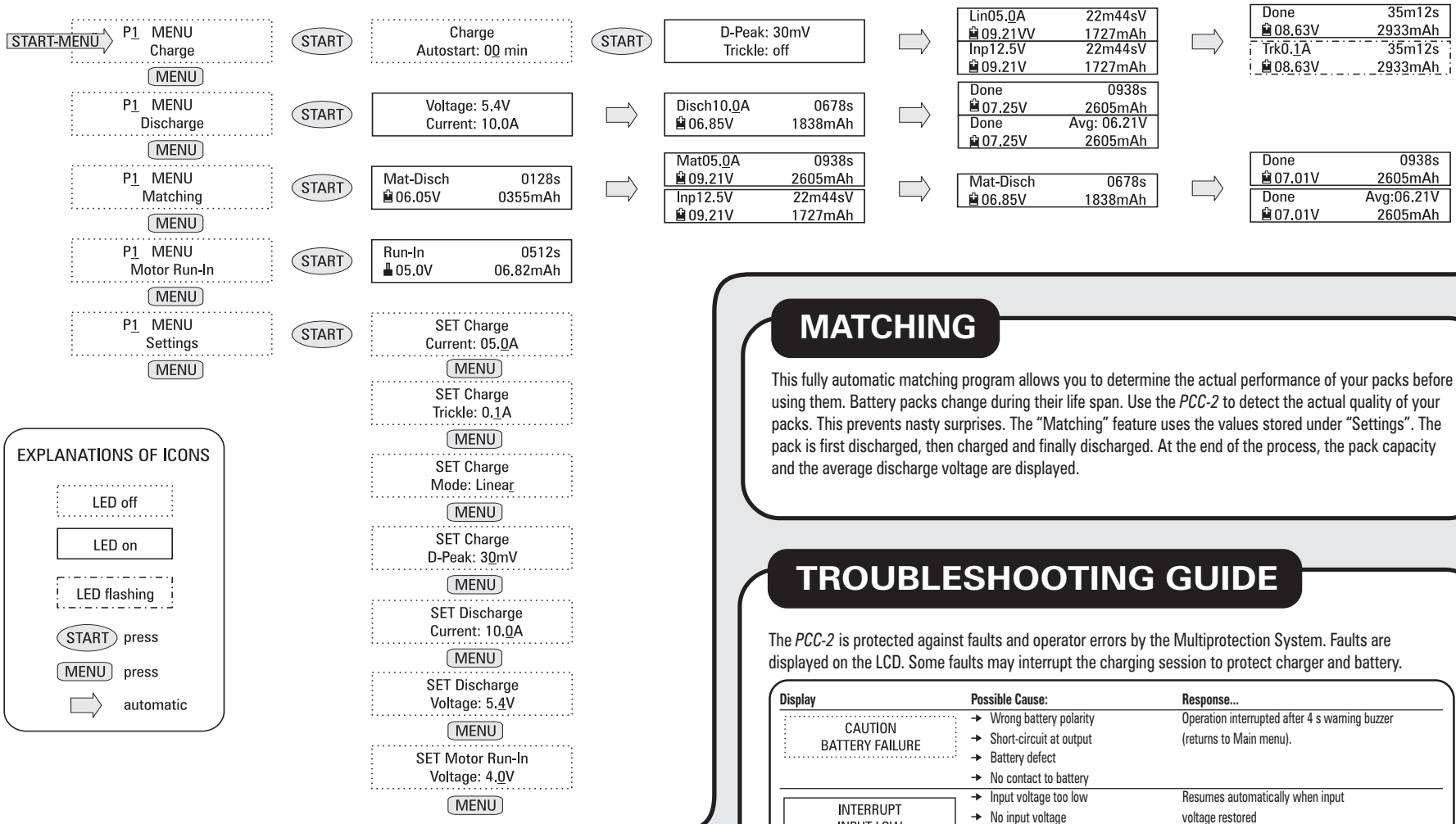
MENU	Scrolls / jumps through the function list
DEC -	Decrements the underscored value.*
INC +	Increments the underscored value.*
START/STOP	Next program step / Start a program / Cancel a running program

* Key has high-speed function for rapid setting (hold down key to change value faster).

Displays:



PROGRAM STRUCTURE



EXPLANATIONS OF ICONS

- LED off
- LED on
- LED flashing
- START press
- MENU press
- ⇨ automatic

CHARGE

SET Charge Current:

The charge current can be set variably from 0.1 to 10.0A. If not otherwise specified by the battery manufacturer, the quick charge current should be max. twice the nominal capacity for Sub-C cells typically used in model-making.

SET Trickle Current:

This current, which flows after delta peak cutoff, is adjustable from 0.0 A to 0.4 A to achieve the highest possible voltage for NiCd cells. Set this function to Off for NiMH cells.

SET Charge Mode:

The *PCC-2* comprises two charging processes.

1. "Linear" = charge at constant charge current. Usual process for competition batteries.
2. "Flex" = charge current is interrupted by short discharge pulses. Optimizes the crystalline structure of the cell interior and hikes performance for older and less used packs.

SET D-Peak (delta peak):

You only obtain the best battery full charge if you "overload" the battery slightly. In practice, it isn't overcharged but at optimum full charge. The battery voltage drops at the end of the charging process (delta). The size of the drop (delta peak) is adjustable in the range from 5 to 95mV. The higher the value, the hotter the battery will be at charge end. We recommend to start with the factory settings.

DISCHARGE

The adjustable discharge circuit (0.1 to 10.0A) can be used for 1- to 8-cell packs.
The *PCC-2* informs you about all the data relating to the battery pack, e.g. discharge time, capacity and average voltage. By discharging your battery pack on the *PCC-2* after use, you obtain vital information about residual capacity for optimizing your motor or gear ratio for the next run.
This also maintains your battery packs in good order. For best maintenance, we recommend the use of the LRP Concept Battery Conditioner (#41360) or the LRP Discharger (#41350).

SET Discharge Voltage:

The cut-off voltage can be adjusted from 0.9 to 7.2V depending on the number of cells. We recommend a cutoff of 0.9 V per cell. This means 3.6 V for a 4-cell pack, or 5.4 V for a 6-cell pack.

MOTOR RUN-IN

You can use this function in a number of ways, e.g.:

- Running in the motor or motor brushes (check for excess current consumption).
- Powering com-lathes
- Powering 7.2 V soldering irons

The voltage setting (you can change this during operation), current and operating time are displayed.

SET Motor Run-In Voltage:

The voltage is continuously variable from 2.0 V to 7.2 V. We recommend a voltage of 4.0 V for running in motor brushes. The special run-up electronics allow trouble-free running-in of motors with very high no-load currents and low number of turns when you set the charger to low voltages.

MATCHING

This fully automatic matching program allows you to determine the actual performance of your packs before using them. Battery packs change during their life span. Use the *PCC-2* to detect the actual quality of your packs. This prevents nasty surprises. The "Matching" feature uses the values stored under "Settings". The pack is first discharged, then charged and finally discharged. At the end of the process, the pack capacity and the average discharge voltage are displayed.

TROUBLESHOOTING GUIDE

The *PCC-2* is protected against faults and operator errors by the Multiprotection System. Faults are displayed on the LCD. Some faults may interrupt the charging session to protect charger and battery.

Display	Possible Cause:	Response...
CAUTION BATTERY FAILURE	→ Wrong battery polarity → Short-circuit at output → Battery defect → No contact to battery	Operation interrupted after 4 s warning buzzer (returns to Main menu).
INTERRUPT INPUT LOW	→ Input voltage too low → No input voltage → Connector on PS/car battery gone	Resumes automatically when input voltage restored
CAUTION VOLTAGE TOO HIGH	→ No. of cells on discharge > 8	Interrupted after 4 s warning buzzer (returns to Main menu).
CAUTION CURRENT HI	→ Current consumption of motor is > 14A → Armature shorted → No contact to motor	Interrupted after 4 s warning buzzer (returns to Main menu).

LCD: LCD stays dark, no function → change the fuse
Fan: Fan is program-controlled and only runs when necessary. It is no fault if fan doesn't run continuously.
Input Low: If input voltage is too low, the *PCC-2* will continue to charge and set the charge current automatically to make sure full battery charge is achieved. If this function is active, "Inp Low" appears in the LCD alternating with the input voltage reading. You cannot increase the charge current manually.
Fuse: The *PCC-2* has an additional internal fuse which protects the charger from irreparable damage if operated incorrectly! The *PCC-2* is supplied with a replacement fuse. It is easy to replace.
Proceed as follows: Make sure that nothing is connected to the *PCC-2*. Slacken two screws in the housing base and fold open the housing. Remove the defective fuse. Insert a new fuse and then close the *PCC-2*.

RECOMMENDED SETTINGS

Cell Type	*Factory Profile*	*No. of Cells*	Charge Settings *Current*	*Delta Peak*	*Trickle*	Discharge Settings *Mode*	*Current*	*Voltage*
Sanyo RC2000 / RC2400		6	5.0A	60mV	0.2A	LIN	10.0A	5.4V
Sanyo RC3000 / RC3300		6	5.0A	25mV	OFF	LIN	10.0A	5.4V
Sanyo RC3600		6	5.0A	15mV	OFF	LIN	10.0A	5.4V
Panasonic 3000		6	4.5A	15mV	OFF	LIN	10.0A	5.4V
Powers 3000		6	4.5A	15mV	OFF	LIN	10.0A	5.4V
GP, Powers, Yokomo 3300	P1	6	5.0A	10mV	OFF	LIN	10.0A	5.4V
Sportpacks <1500mAh		6	3.5A	50mV	0.1A	FLX	10.0A	4.8V
Sportpacks >1500mAh	P2	6	4.0A	50mV	0.1A	FLX	10.0A	4.8V
Micro-/Receiver-Packs	P3	5/6	1.2A	30mV	OFF	LIN	1.0A	4.0V
Transmitter Packs		8	1.0A	30mV	OFF	LIN	0.8A	7.2V

LRP SERVICE

LRP Customer Service:

- Package your product carefully. Include sales receipt.
- ↓
- Send parcel to your national LRP distributor.
- ↓
- Distributor repairs the product.
- ↓
- Shipment back to you usually by COD (cash on delivery), but is subject to your national LRP distributor's general policy.