

CALIBRATION

1. MAXIMUM CURRENT:

- Connect the Trickle Charger to a battery through an ammeter (500mA to 1A scale), in series with either lead.
- Adjust R19 to obtain the desired current.

NOTE: Battery voltage must be lower than the programmed float voltage (one volt or more).

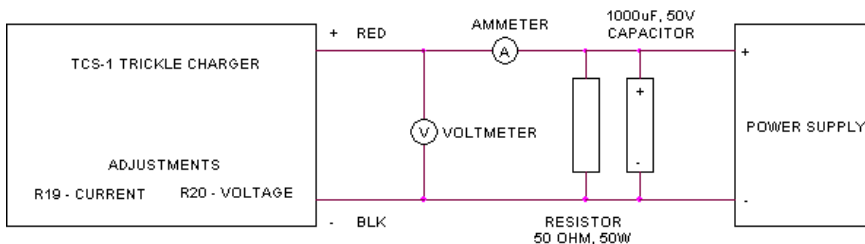
2. FLOAT VOLTAGE:

NOTE: Voltage adjustments cannot be performed with no load.

- Connect the Trickle Charger output to a Power Supply, in parallel with a resistor/capacitor load network (see diagram).
- Connect also an ammeter in series with either lead and a voltmeter across the output.
- Adjust the Power Supply voltage towards the required level (e.g., 28V).
- Adjust R20 to make the charge current diminish to about 5 to 10% of the maximum current, when the Power Supply is at the required float value. (e.g., at 28.0V, the current should go down to about 10mA to 20mA).
- Adjust the Power Supply above and below the set voltage and observe that the current is controlled as expected.
- Test on a battery and re-adjust as required (note: allow for the battery voltage to stabilize).

ADJUSTMENTS

CAUTION! 36V is present at the input of the Trickle Charger



JFM Engineering, Inc.

TCS-1

Battery
Trickle Charger

Instruction Manual



JFM Engineering, Inc.

Instructions

TCS-1 Trickle Charger Rev 1.0 - 27 April 2009

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DESCRIPTION

The TCS-1 Trickle Charger is a low current, constant current/constant voltage charger, that can be used to trickle charge Nickel-Cadmium and Lead-Acid batteries. Its primary use is to maintain the batteries at full charge while the batteries are in storage (to compensate for the battery self-discharge). The TCS-1 Trickle Charger can also be used as a full charger for batteries of up to 5.0A-hr (@ C/10).

When the battery voltage is below the programmed float voltage, the TCS-1 Trickle Charger is in constant current. In this mode, it will output the preset current into a single cell (or short circuit) up to 22 Nickel-Cadmium cells (0V to 31V).

When the battery voltage reaches the programmed float voltage, the TCS-1 Trickle Charger is in constant voltage. In this mode, it adjusts the current automatically to maintain the preset battery voltage. The charge circuit delivers the maximum programmed current until the voltage is within 0.5V of the preset value. At this point, the current automatically diminishes and will settle at the rate needed to maintain the battery at the float voltage. *Note: The intensity of the LED provides a relative indication of the control of the current.*

The typical trickle charge current is 3mA/A-Hr for a float voltage of 1.4V/Cell (Nickel-Cadmium). E.g., a 20 cell, 40A-hr battery will require about 120mA to maintain 28V. However, the actual amount of current taken by the battery will be a function of the condition of the battery, and will be controlled automatically by the voltage regulator in the TCS-1 Trickle Charger.

The automatic operation of the TCS-1 Trickle Charger makes it immediately usable with no need for adjustments, except under very specific conditions, such as for batteries with other than 20 cells Nickel-Cadmium or 24V Lead-Acid (change of float voltage), or for batteries of 10A-hr or less (lower maximum current).

SPECIFICATIONS

Input:	Universal, 115VAC-230VAC, 50-60Hz
Output:	32V max (nominal), 500mA max (nominal)
Modes:	CONSTANT CURRENT: adjustable, from 0 to 500mA CONSTANT VOLTAGE: adjustable, from 9V to 31V
Protection:	Open circuit, short circuit and reverse polarity (internal fuse)

Note: Contact the Factory for custom specifications

INSTRUCTIONS

The TCS-1 Trickle Charger is factory pre-set at 400mA maximum current and 27.5V float voltage. If different settings are required, see CALIBRATION instructions.

For total reverse polarity protection, connect first the Trickle Charger to the battery and then the power supply to the Trickle Charger .

NOTE: Do not re-adjust the Trickle Charger for different A-Hr ratings.

NOTE: Connect the Trickle Charger to fully charged batteries only.

OBSERVE POLARITY! RED = POSITIVE and BLACK = NEGATIVE