SENS

MODEL SC-2-48 - 3

SERIAL 007

AC INPUT 120V-1Ø-60Hz

DC CURRENT RATING 3 Amp.

ADJUSTED FOR 37 CELLS Ni-Cd BATTERY

FLOAT VOLTAGE 52.5 VOLTS

BOOST VOLTAGE 57.4 VOLTS

THEORY OF OPERATION

The "SC" chargers utilize phase-controlled firing of an SCR rectifier to obtain complete control over the charging voltage and current. Separate circuits are used to compare voltage against a reference value and to compare current against a separate reference value.

Feedback control of the firing circuit is highly accurate for both voltage and current. No current drop is encountered as the battery voltage rises during high-rate charging. When the charger has switched to its constant-voltage mode, the battery is supplied with whatever current is necessary to maintain its voltage but with no voltage difference occuring whether the battery demands high or low trickle current.

Both current and voltage references are given negative temperature coefficients. In the case of the current-control system, this permits the charger to produce higher-than-rated-current until it comes up to temperature and provides a self-protecting tendency by reducing the charger's output when the ambient is hotter than rated. For the voltage control system, the charger's temperature characteristic is designed to match that of the battery. This provides optimum charging at all ambient temperatures.

INSTRUCTIONS

The SENS Model SC Battery Charger is a voltage regulated-current limited battery charger suitable for use with lead-acid or nickel cadmium batteries. Ratings for various batteries are shown on the data sheet.

Upon receipt from the carrier, the unit should be carefully inspected for damage caused in transit. Any damage should be reported immediately to the freight carrier.

The charger should be mounted on a wall or similar surface with at least 6" clearance above and below the unit to provide adequate cooling air. Mounting flanges are provided on the top and bottom of the unit.

The lower front panel of the unit should be removed to gain access to the terminal block to make AC input and DC output connection. Conduit entry is provided at the bottom for AC and DC conduits.

The unit is factory adjusted for values shown and field adjustments are normally unnecessary. In the event it is necessary to make voltage adjustments, they may be made as follows: (Due to the time required for the battery to respond to changes in voltage setting, adjustments should be made in small increments.)

FLOAT VOLTAGE: With the switch in the "float" position, insert an insulated screwdriver through the lower screen into the hole in the black box nearest the outside of the unit and adjust to the desired level. This adjustment should be made only after the unit has been operating in the "float" mode for at least 2 hours.

BOOST VOLTAGE: (Note: Float voltage must be correctly set before setting boost voltage.) With the switch in the "boost" position, insert an insulated screwdriver through the lower screen into the hole in the black box nearest the center of the unit and adjust to the desired boost voltage. This adjustment should be made only after the unit has been in the "boost" mode of operation for at least 2 hours to insure that the unit is at the correct operating temperature.

TROUBLE SHOOTING

As this unit has been manufactured using only carefully selected components, it is unlikely that any malfunction will develop; however, should the charger fail to operate properly, the following procedures will make it possible to isolate the source of trouble:

1. Check fuses in both the AC and DC lines with ohmmeter to be certain that they have not blown.

2. Check battery polarity by observing voltmeter. If voltmeter reads in reverse direction, the battery has been connected improperly.

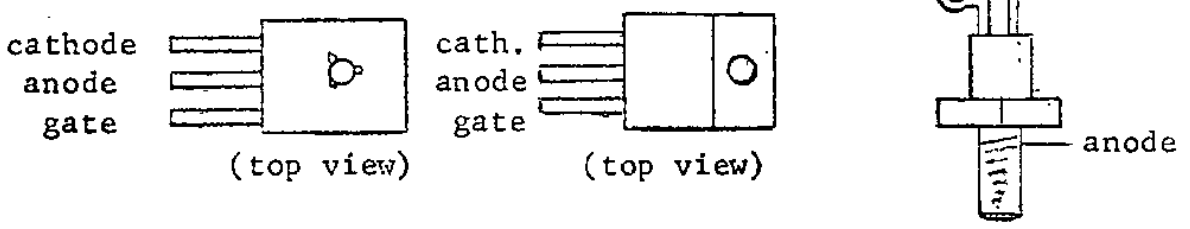
3. Check battery voltage by observing voltmeter. If voltage is less than 50% of nominal battery voltage, the control circuit may not permit the unit to function due to its inherent short-circuit protection feature. If this is the case, it may be necessary to temporarily connect another battery in parallel to raise the voltage sufficiently for the unit to operate.

4. If neither fuse is blown, and the battery polarity and voltage are correct, additional tests should be made as follows (after disconnecting unit from the AC line and from the battery):

   a) Check resistance of R-1 with ohmmeter.

   b) Check rectifier elements (RECT-1) using ohmmeter. Each element should have resistance of more than 10 K ohm in one direction and with ohmmeter leads reversed should read mid-scale or less in other direction. If a diode has low resistance in both directions, assembly RECT-1 should be replaced.

   c) Check both SCR-1 using ohmmeter. Resistance between anode and cathode should be more than 10 k ohms (SCR units may be one of following):



d) If R-1, RECT-1 and both SCR-1 check out as noted in a, b and c, replace CC-1 and both SCR-1

5. If fuse in AC line is blown:

a) Check RECT-1 elements as in 4 (b).

b) Check SCR elements as in 4 (c).

c) If (a) and (b) tests indicate no failure, transformer T-1 should be checked by disconnecting one of its secondary leads, inserting a new fuse in the AC line and applying AC power. If fuse blows, connections should be examined for short circuits and if none are found, T-1 should be replaced.

6. If fuses in both AC and DC lines are blown:

a) Check R-1 with ohmmeter.

b) Check wiring associated with R-1.

c) Check RECT-1 elements as in 4 (b).

d) Check both SCR-1 as in 4 (c).

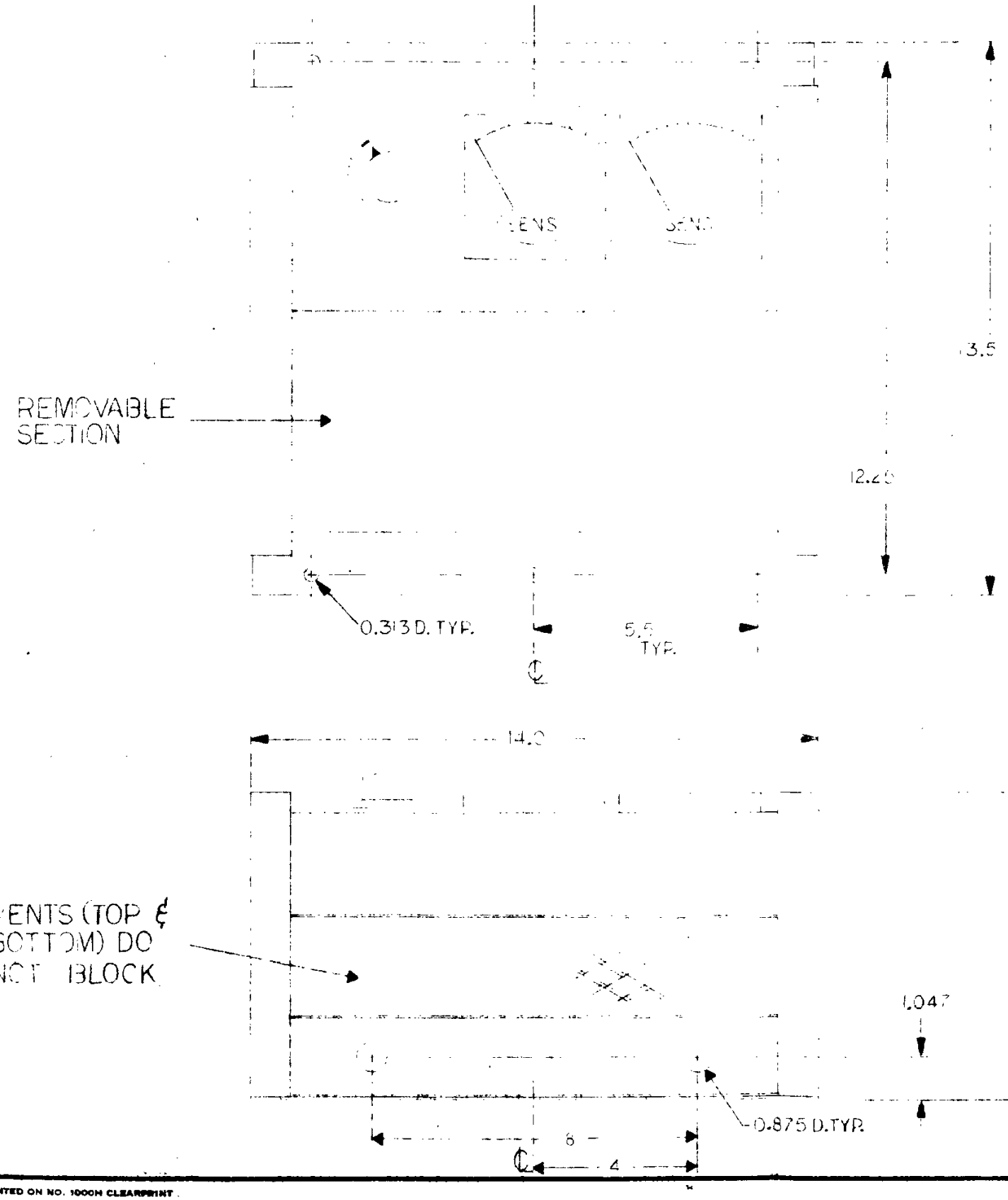
e) If steps (a) through (d) fail to disclose a defective component, replace CC-1 and both SCR-1.

7. If the unit charges at twice the normal current or more:

a) Check R-1 with ohmmeter.

b) Check wiring associated with R-1.

c) If both (a) and (b) are correct, replace CC-1 and both SCR-1.



OPTIONAL ACCESSORIES

- [ ] TIMER (BOOST) 0-24 HOURS
- [X] AC POWER FAILURE ALARM CONTACTS
- [X] GROUND DETECTOR ALARM CONTACTS
- [ ] LOW VOLTAGE ALARM CONTACTS
- [ ] HIGH VOLTAGE ALARM CONTACTS
- [ ] CHARGE FAILURE ALARM CONTACTS

MATERIAL : ALL EXCEPT ALUMINUM CONTROL PANEL
FINISH : GRAY PAINT EXCEPT CLEAR ANODIZE CONTROL PANEL

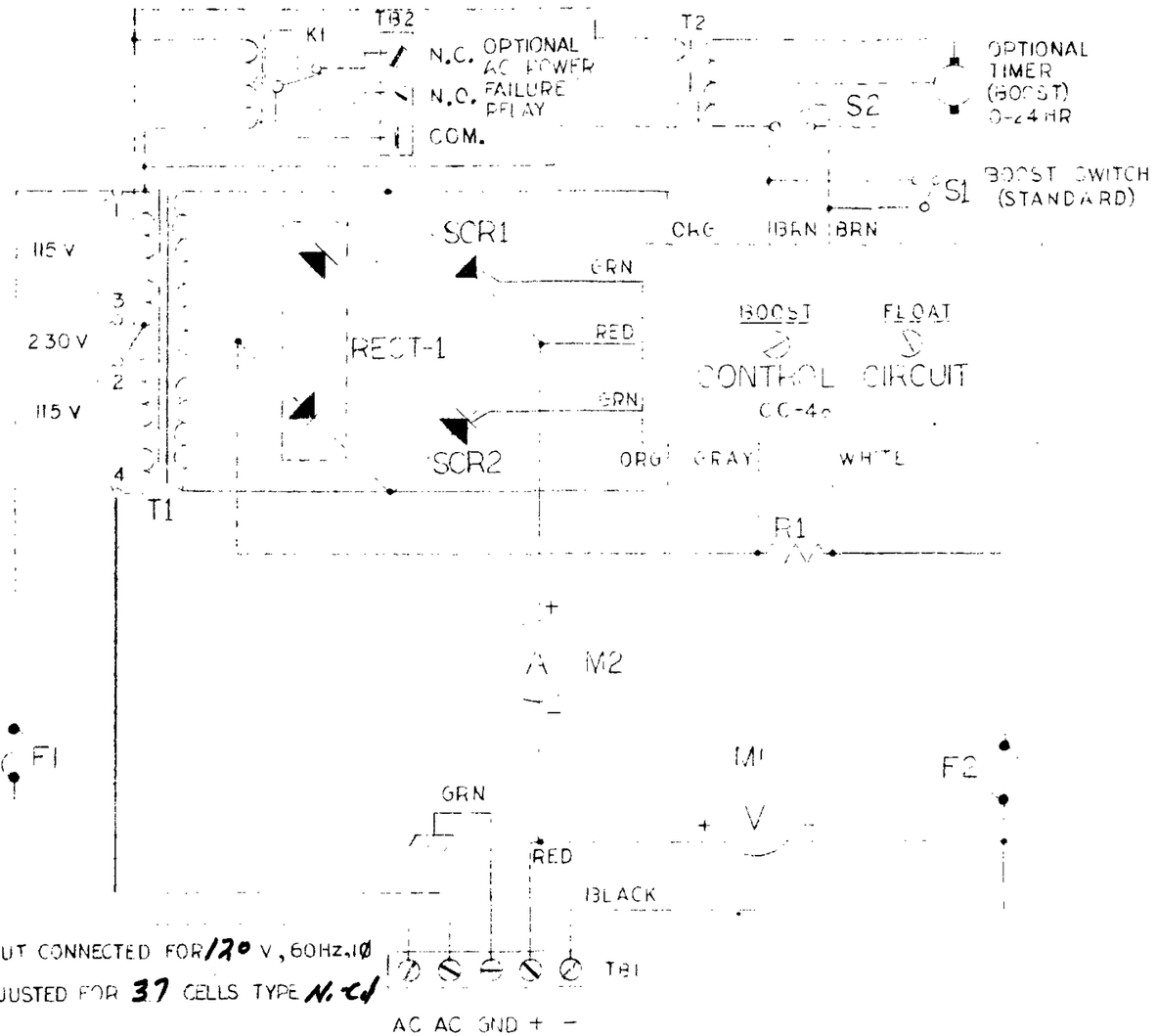
ITEM	APP'D.	DATE	REV

STORED ENERGY SYSTEMS

SCALE: NTS	APPROVED BY: R. Wilson	DRAWN BY jac
DATE: 1-29-70		REVISED

CHARGER, BATTERY, TYPE SC2-48-3

PARTS LIST & CIRCUIT: SEE B2-SC2-48-3	DRAWING NUMBER B1-SC2-48-3



INPUT CONNECTED FOR 120 V, 60Hz, 1Ø

ADJUSTED FOR 37 CELLS TYPE N.Cd

ITEM	QUAN	DESCRIPTION	MFG	PART NO.
CC48	1	CONTROL BOX	SENS	P2064
F1	1	FUSE, SLO-BLO, 3A	BUSS	MDX 3
F2	1	FUSE, SLO-BLO, 5A	BUSS	MDX 5
M1	1	0-75 DC VOLTMETER	SENS	P7152
M2	1	0-5 DC AMMETER	SENS	P7180
R1	1	RESISTOR 0.1Ω 5W.	SENS	P4222
RECT-1	1	DIODE ASSY.	SENS	P4135
S1	1	SWITCH SPDT	SENS	P7223
SCR-1,2	2	SILICON CONTROLLED RECTIFIER	MOTOROLA	2N4442
T1	1	TRANSFORMER	SENS	P6051
TB1	1	TERMINAL BLOCK	CINCH-JONES	3-141-$\frac{3}{4}$W
S2	1	TIMER, 0-24 HRS	SENS	P7120
T2	1	TRANSFORMER	SENS	P6057
K1	1	RELAY SPDT AC PWR FAILURE	P & B	KRP-5A-120-AC
TB2	1	TERMINAL BLOCK	CINCH-JONES	3-141-$\frac{3}{4}$W

ITEM	APPD.	DATE	REV.

STORED ENERGY SYSTEMS

SCALE	APPROVED BY:	DRAWN BY jac
DATE: 1-29-70		REVISED

CIRCUIT & PARTS LIST, CHARGER, SC2-48-3

OUTLINE: SEE BI-SC2-48-3	DRAWING NUMBER B2-SC2-48-3

11X17 PRINTED ON NO. 1000H CLEARPRINT