MULTI CELL CHARGER

MMGTX70.MAN

INDEX PAGE

SECTION 1 - INSTALLATION

1.1 RECEIVING

Immediately upon receipt of the charger, check it against the shipping invoice to ensure the shipment is complete and undamaged. Examine the outside of the packing for signs of rough handling before accepting the charger from the carrier.

If there is evidence of damage, the receipt should be signed, and both copies(carrier's and receiving copies) marked "Shipment Received Damaged". The carrier's representative should be called immediately and asked to make a "Carrier's Inspection for Concealed Damage Report". If concealed damage is later detected, the carrier should be called and requested to make a "Carrier's Inspection for Concealed Damage Report".

After inspection by the carrier, arrangements should be made with your GNB representative to have the charger repaired before placing it in service. When contacting GNB for assistance on a damage claim or shipment error, provide the Model, and Serial Number of the charger, and a full description of the damage or error.

Generally, it is good practice to move the charger to the installation site before uncrating. When using bars, hammers, etc. for uncrating, use care to avoid damage to the charger.

1.2 LOCATION

For the best operating characteristics and longest life, take care in selecting an installation site. Avoid locations exposed to high humidity, temperature extremes or dust. Moisture condensing on machine parts and electrical components can cause corrosion which seriously affects operation, efficiency and life. Dust and dirt will also decrease heat radiation from heat-generating components, such as transformers and diodes. This will result in higher operating temperatures and shorter life. Adequate air circulation is needed at all times in order to ensure proper operation. Provide a minimum of 6 inches of free air space at the sides and rear of the charger. The front of the charger must remain unobstructed for serviceability.

1.2.1 MECHANICAL INSTALLATION

All units are shipped equipped for floor mounting. It is recommended that a minimum of six (6) inches be maintained between units or any obstruction for free air flow.

1.3 LINE VOLTAGE ADJUSTMENTS

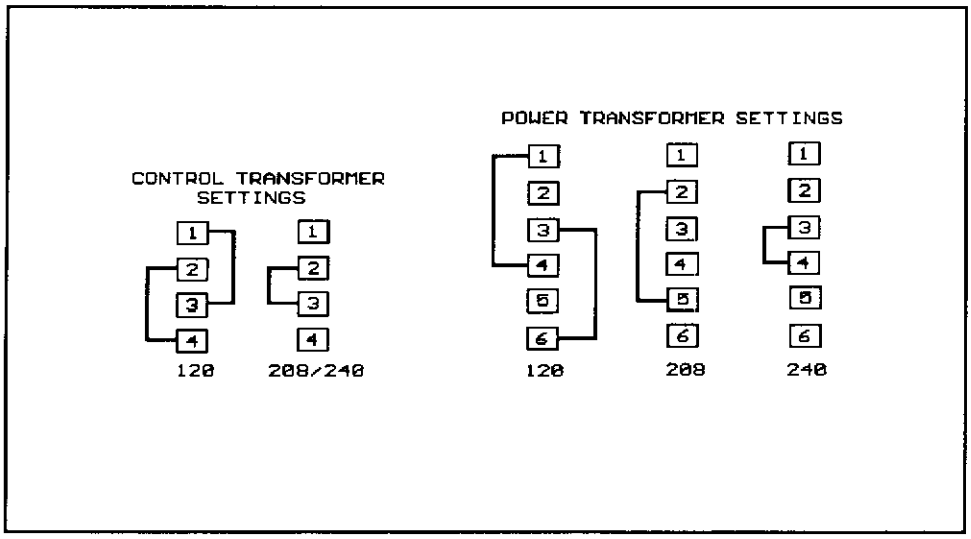
All chargers are shipped with the AC line voltage jumper wires set for the AC voltage specified on the purchase order. Note: On all single input voltage chargers, there are no input adjustments.

Before connecting the charger to the AC service, it should be verified that the internal AC voltage connections match the available AC service voltage. If necessary change the AC voltage jumper wires shown in Fig. 1.3.1. NOTE: It is not necessary to make any additional changes such as contactor coil, control transformer, etc.

CAUTION: It will be necessary in most cases to change the AC fuse when the AC voltage jumpers are changed. Refer to the fuse chart on the inside door of the charger for the correct fuse rating.

Figure 1.3.1

120/208/240 Single Phase Jumper Arrangement



1.4 AC SERVICE REQUIREMENTS

Follow local code requirements if they are different than the instructions in this manual. After checking the transformer connections as described in Paragraph 1.3, refer to Table 1 to determine the correct ratings for the AC cable, AC fuses, and AC service disconnect switch for the line amperes as listed on the nameplate of the charger for the available AC voltage.

TABLE 1

Line Amperes	Disc. Sw.	Fuse Size Amps	Power Cable Size
0 - 2.5	30A	5	#14
3 - 4.5	30A	7	#14
5 - 7.5	30A	10	#14
8 - 11	30A	15	#14
11.5- 15.5	30A	20	#12
16	30A	25	#12
16.5- 18	30A	25	#10
18.5- 22	30A	30	#10
22.5- 27	60A	35	#10
27.5- 32	60A	40	#8
32.5- 34.5	60A	50	#8
35 - 40	60A	50	#6
40.5- 43.5	60A	60	#6
44 - 48	60A	60	#4
48.5- 64	80A	80	#4
65 - 80	100A	100	#3
81 - 95	125A	125	#2
96 - 110	150A	150	#1
111 - 125	150A	150	1/0

For 120 to 240 volt lines, use 240-volt disconnect switch. For 480 to 600 volt lines, use 600-volt disconnect switch.

*Two conductors and ground wire required for single phase.
**Three conductors and ground wire required for three-phase.

1.5 CONNECTING AC SERVICE TO THE CHARGER

1.5.1 Single-Phase Models- Connect the AC service to the L1 and L2 terminals.

1.6 GROUNDING THE CHARGER

The charger must be grounded to the AC system ground for personnel safety. The green ground wire in the AC input cable must be connected to the charger ground stud (identified by a green dot and ground symbol). Follow local electrical codes.

1.7 BATTERY CONNECTOR AND CHARGING CABLE

Verify that the connector on both the battery and the charger are attached so that the positive output terminal of the charger is connected to the positive battery terminal.

CAUTION - IF THE POLARITY IS REVERSED, THE DC FUSE WILL BLOW. IF IN DOUBT, CHECK THE POLARITY WITH A DC VOLTMETER.

1.8 CHARGING RATE ADJUSTMENT

The charging rate has been set at the factory, therefore, field adjustment should not be necessary. If there appears to be a charging rate problem, refer to the troubleshooting chart, Section 4.

If it is necessary to either increase or decrease the charging rate, a rate adjustment terminal board is provided on the transformer bracket located behind the heat sink. Change only one step at a time and observe the effect on the battery before making a second change. The charging rate is increased by moving to the next higher tap setting in Table 2. The charging rate is decreased by moving to the next lower tap setting.

TABLE 2
CHARGING RATE ADJUSTMENTS

CONNECT RED JUMPER WIRE TO	CONNECT BLACK WIRE #8 TO	OUTPUT
9	12	HIGHEST
9	11	
9	10	
9	8	NORMAL
12	11	
12	10	
12	9	LOWEST

SECTION 2 - OPERATION

2.1 CHARGER DESCRIPTION

The GTX charger is a full-wave silicon diode industrial battery charger that utilizes a ferro-resonant transformer for isolation and control of the output. It is designed to charge lead-acid batteries of varying ratings from 6 to 36 cells, selectable by an internal tap change. Cell sizes are selected by moving power plugs (located at the top center of the charger as viewed when the door of the charger is opened). See fig. 2.1

Front panel control includes a electro-mechanical timer, and a LED (light emitting diode) Bargraph type ammeter, that displays the output to the battery in percent of full power. When the timer clocks out, the charge will be terminated. The charger contains an AC input contactor, AC input fusing and DC output fusing.

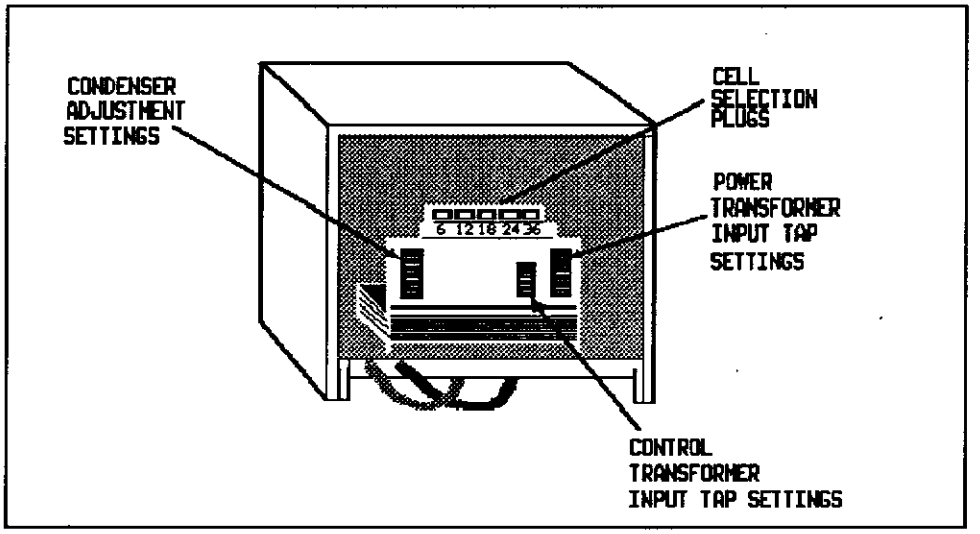


Figure 2.1

2.2 NORMAL (DAILY CHARGE)

NOTE: Before the use of the charger, disconnect all power to the charger and open the door. Observe the cell-tap change setting to make sure that it is set for the proper number of cells, to coincide with the battery being charged. Close the door and fasten it

Make sure the timer is placed in the off position, and the Bar-graph displays no output current. Connect the battery. **NOTE: the battery must be connected for the charger to turn on.** The Bar-graph LEDs should light, and should indicate the charging current in percent of power output. The charging current will taper from its rated output current to a low value at the end of the cycle. Disconnect the battery after the charge cycle has been completed. **CAUTION: Do not disconnect the battery until the Bar-graph** is off.

2.3 EQUALIZE CHARGE

Batteries may need periodic equalizing charges to correct for inequalities between cells, that result from frequent deep discharges. An equalizing charge should be given if any of the following conditions exist:

A. The specific gravity of any cell at the end of charge is 20 points less than the average of all the cells.

B. The on-charge voltage of any cell at the end of charge is 20 millivolts less than the average of all the cells.

C. The battery has been stored for 30 days.

The procedure for an equalizing charge is the same for a normal charge except the timer control is set to the equalize area instead of daily charge.

2.4 EMERGENCY SHUTDOWN

If it is necessary to disconnect the battery during the charge cycle, first terminate the charge manually by switching the timer to the off position. Make certain that the DC ammeter bar graph reads ZERO before disconnecting the battery.

SECTION 3 - TROUBLESHOOTING

CAUTION- There are lethal voltages exposed when the charger is energized with the door open. Always disconnect the AC service voltage to the charger before opening the door. The following chart lists the most probable cause of a problem.

SYMPTOM	POSSIBLE CAUSE
1. No charging current, Bar-graph does not light, contactor does not operate	1A. Blown AC fuse 1B. No AC service voltage 1C. Incorrect AC voltage 1D. Defective timer 1E. Defective contactor
2. No charging current, contactor does operate	2A. Blown DC fuse 2B. Defective ammeter bar graph 2C. Open battery cell 2D. Defective diode 2E. Defective capacitor 2F. Battery is fully charged 2G. Number of battery cells

	exceeds the charger cell-rating.
	2H. Shorted power transformer
	2I. Open coil on contactor
3. AC fuse blows	3A. Incorrect fuse rating
	3B. Incorrect AC voltage
	3C. Shorted transformer winding
4. DC fuse blows	4A. Reversed battery connector
	4B. Incorrect fuse rating
	4C. Shorted diode
	4D. Charger cell-rating exceeds the number of battery cells.
5. Excessive water loss in battery	5A. Charging rate is too high. See Section 1.8
	5B. Battery is usually charged for more than 16 hours.
	5C. Battery is usually discharged less than 40% when put on charge.
	5D. Charger amp-hour rating exceeds the battery AH rating
	5E. Battery has one or more defective cells
6. Low specific gravity at the end of the charge cycle.	6A. Battery was over-discharged
	6B. Charge cycle terminated too early.
	6C. Charger amp-hour rating is less than the battery AH rating.
	6D. Charging rate is too low. See Section 1.8
	6E. Battery has defective cells.
	6F. Battery has been over-watered.

SECTION 4 - REPLACEABLE PARTS

4.1 ORDERING INFORMATION

The following information must be supplied when ordering a replacement part in order to ensure that the correct part is supplied:

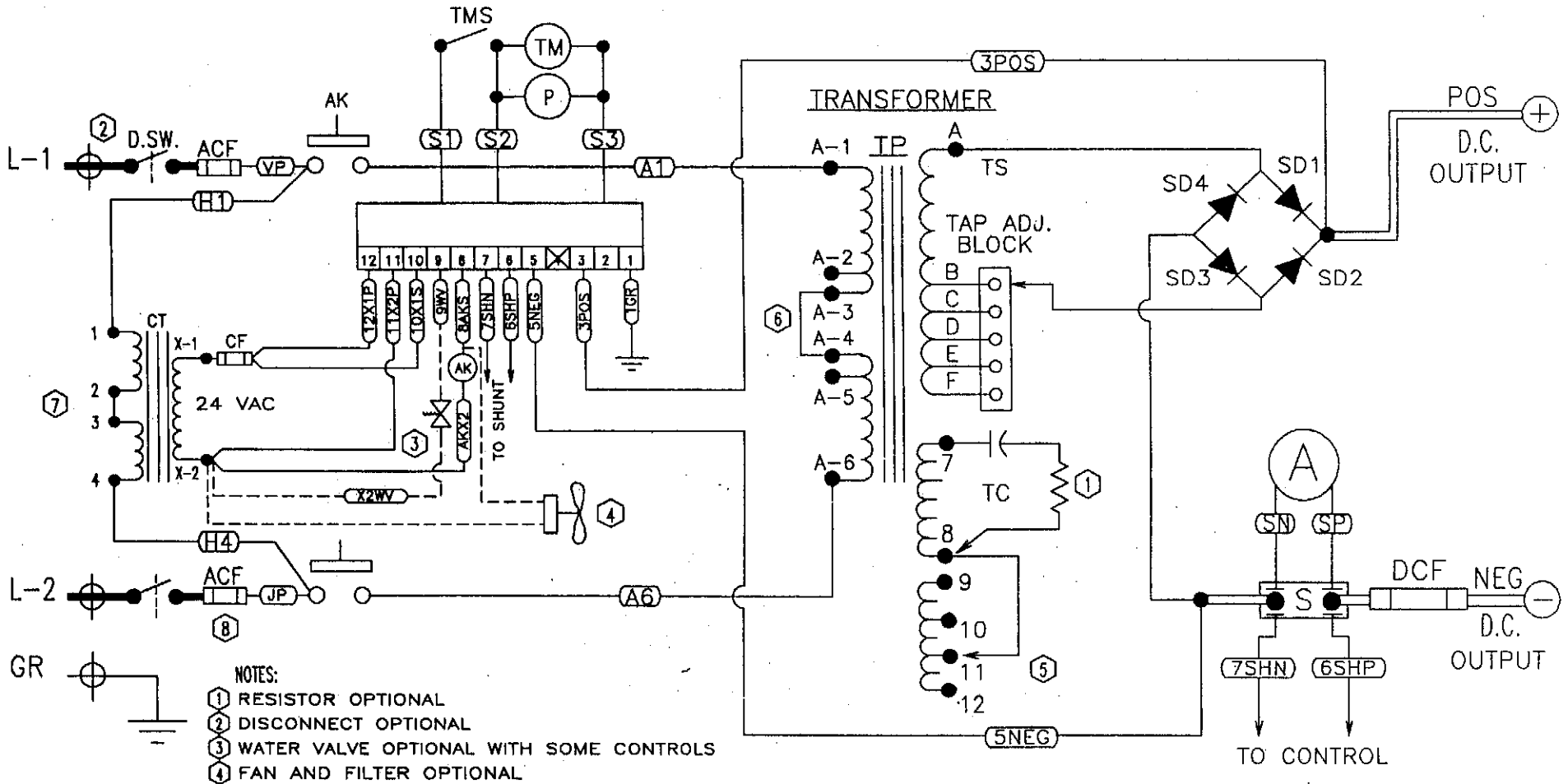
A. Model number of charger
B. Serial number of charger
C. Reference symbol or part
D. Description of part
E. Specification number

4.2 RECOMMENDED SPARES

The quantity of spares stocked to service a group of charger should be increased as the number of chargers increases. The following chart is the minimum quantity recommended per model for multiple charger installations:

# of chargers	# of spare parts kits
1-3	1
4-10	2
11-25	3
26-50	4
51-100	5

Schem. Symbol	Description	Qty. Used	Qty. Recommended
ACF	AC Fuse, 1 ph.	2	4
DCF	DC Fuse	1	2
TM	Timer	1	1
AK	AC contactor	1	1
SD1,SD2	Silicon Diode, 1 ph.	2	2
TP	Transformer, 1 ph.	1	0
C	Capacitor	Varies	1
CT	Control Transformer	1	1



NOTES:

1. RESISTOR OPTIONAL
2. DISCONNECT OPTIONAL
3. WATER VALVE OPTIONAL WITH SOME CONTROLS
4. FAN AND FILTER OPTIONAL
5. OUTPUT TAP ADJUSTMENT OPTIONAL
6. POWER TRANS. TAPS ARE AS FOLLOWS:

SET VOLTAGE	1 AND 6
DUAL "	1,5 AND 6
TRI "	1,2,3,4,5, AND 6

NOTE: TRI VOLTAGE SHOWN IN HIGH VOLTAGE SETTING

7. CONTROL TRANS. TAPS ARE AS FOLLOWS:

SET VOLTAGE	NONE
DUAL "	NONE
TRI "	1,2,3 AND 4

NOTE: TRI VOLTAGE SHOWN IN HIGH VOLTAGE SETTING

8. FOR 120V OPERATION, INSTALL A DUMMY FUSE IN LINE 2. CONNECT THE NEUTRAL INPUT LEAD TO LINE 2.

DWG. NO.	WIRING DIAGRAM: 1 TRANS, 1 PHASE, MULTI-CELL,EXT. METER,STAND CONFIG			02-577A
02-577A	DR. WLM	DATE: 01/12/98	CHK:	