

INSTALLATION & OPERATING INSTRUCTIONS



SCR FLX SERIES INDUSTRIAL BATTERY CHARGERS

GNB**SCRFLX CHARGER
WARRANTY**

This Warranty Agreement entered into between GNB Industrial Power, "GNB", and the Original User in respect to GNB electric vehicle battery chargers for electric vehicle usage.

1.0 GENERAL

GNB warrants that each new electric vehicle battery charger supplied by it, is of good workmanship and is free from any inherent mechanical defects, provided:

- 1.1 The product is installed and operated in accordance with generally accepted Industrial standards and in accordance with the printed instructions supplied with the charger.
- 1.2 The charger is used under conditions for which it was designed and is not subject to misuse, negligence or accident.
- 1.3 The charger receives proper care, protection, and maintenance under supervision of competent personnel.
- 1.4 The charger is used within the published performance rating for the unit involved.
- 1.5 The charger is used exclusively by the original user and by no other persons.

2.0 PERSONS COVERED

This warranty is extended by GNB only to the original user who purchases or leases a new charger product from GNB or one of its authorized representatives. The product purchased or leased under this agreement shall be used exclusively by the original user and its employees and by no other persons and, therefore, there shall be no third party beneficiary to this warranty.

3.0 WARRANTY PERIOD

The charger is warranted for four (4) years from the date of manufacture as determined by the product serial number, with the following exceptions:

- 3.1 Power transformers, SCR's and silicon diodes are warranted for ten (10) years from the date of manufacture of the charger(s) of which they are a part.
- 3.2 Primary switch contacts, fuses, bulbs, and filters are not warranted unless found to be defective prior to use.

4.0 LIMITATION OF REMEDY

Any claimed defect is subject to GNB's inspection and judgment, after the defective product has been returned by the original user at its expense to GNB's designated point of shipment.

- 4.1 GNB's liability is limited to the repair of the defect or, at GNB's option, the replacement of the defective parts. During the initial three (3) years of charger warranty period, GNB will bear all parts and labor costs of such repair or replacement. During year four (4) of the warranty, GNB will only cover parts, no labor or travel will be provided by GNB. During the last six (6) years of the ten (10) year warranty on power transformers, SCR's and silicon diodes, GNB will bear costs of parts replacement only; no labor or other services will be provided by GNB. GNB shall not be obligated to reimburse the original user or any other person for any work performed.
- 4.2 Replacement and exchange parts will be warranted for a period of ninety (90) days.
- 4.3 GNB and its authorized representatives shall not be liable for direct or indirect, special or consequential damages in excess of such repair or replacement. In no event shall the original user be entitled to recover for contingent expenses resulting from but not limited to, telephone calls, telegrams, travel expenses, lodging, duties and taxes, labor, rental or replacement equipment, loss of business or profits or other commercial losses.
- 4.4 GNB will only bear costs for freight 12 months from the initial date of shipment on any replacement or repair.

5.0 USE OF DEFECTIVE PRODUCT

Continued use of a defective charger after discovery of a defect will void all warranties.

6.0 REPAIRED OR MODIFIED EQUIPMENT

Except as authorized in writing, this warranty does not cover any equipment that has been repaired or modified by any party other than GNB.

EXCEPT AS STATED ABOVE, ALL OTHER WARRANTIES AND CONDITIONS, EITHER EXPRESS OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXCLUDED AND ORIGINAL USER ASSUMES ALL RISK AND LIABILITY RESULTING FROM USE OF THE PRODUCT. GNB NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR GNB ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OR USE OF THE PRODUCT, AND THERE ARE NO ORAL AGREEMENTS OR WARRANTIES COLLATERAL TO OR AFFECTING THIS WRITTEN WARRANTY.

**GNB Industrial Power
Motive Power**
829 Parkview Boulevard
Lombard, IL 60148-3249
U.S.A.
Tel: 877.GNB.INFO
Fax: 630.691.7869

**GNB Industrial Power
Motive Power**
8301 Keele Street
Maple, Ontario
Canada L6A 1T2
Tel: 905.669.9326
Fax: 905.669.7688

**Exide Technologies
Chloride Motive Power**
P.O. Box 1, Salford Road
Over Hulton, Bolton BL5 1DD
United Kingdom
Tel: 44.1204.661.230
Fax: 44.1204.652.100

GNB

INDUSTRIAL POWER

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SCRFLX SERIES INDUSTRIAL BATTERY CHARGERS

1.0 IMPORTANT OPERATING AND SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

- a) Before using the battery charger, read all the instructions in addition to the CAUTION, WARNING, and DANGER markings on the charger, battery and all the associated equipment.
- b) Do not touch uninsulated parts of the DC output connector or the battery terminals, as there is a possibility of electric shock.
- c) Connect or disconnect the battery plug only when the charger output is off; **ALWAYS press the STOP pushbutton before unplugging the battery to prevent arcing or burning.**
- d) If the battery is unplugged during charging, the charger will indicate "OFF". To restart the charger, plug in the next battery.
- e) Only qualified personnel should operate or service this equipment.
- f) De-energize all AC and DC power connections before servicing this unit. If injury does occur, apply the prescribed treatment for electrical shock and obtain medical attention immediately.
- g) The charger is NOT for outdoor use. Do not expose the charger to rain or snow.
- h) This charger is factory set to charge flooded lead-acid batteries only. Operating environment should not contain any contaminations that may cause corrosion or contamination that would degrade the performance of a charger.
- i) Do not operate this unit if it has received a sharp blow, been dropped or otherwise damaged. Take it to a qualified GNB service center.
- j) Do not disassemble the charger. Have the charger examined by a GNB service representative or local qualified service facility. Incorrect re-assembly of the charger may result in an explosion, electric shock or fire.

2.0 INTRODUCTION

The GNB SCRFLX battery chargers are convection cooled, solid state, micro-processor controlled SCR regulated chargers designed to make battery charging simple. They are designed to charge flooded lead-acid batteries only.

The charger has a comprehensive self-checking diagnostic program to control all charger functions, monitor the quality of charge and check its own safety conditions. Large easy to read LEDs, three button keypad and LED display report on charger and battery status.

3.0 RECEIVING CHARGER

Examine the charger thoroughly before using, to make sure that no parts have been loosened or damaged during shipment. Check the contents of the package against the delivery slip before disposing of the shipping package. If any shipping damage or partial loss is found, file a claim with the carrier without delay and take any necessary steps to protect your rights. Before installing, check that the charger nameplate data corresponds to the packing slip and to the model specified on the original sales order.

The SCRFLX chargers are delivered on skids for easy handling using a fork lift truck.

4.0 LOCATION AND INSTALLATION OF CHARGER

Proper installation is important in order to achieve good charger performance, long troublefree operation and to prevent damage to the charger and batteries. The charger should be located in a clean, cool, normal ambient room temperature (between +45°F/7.2°C and 90°F/32.2°C) dry and well ventilated area. To permit free air flow for convection cooling allow four inches minimum between the charger and any wall, six inches from other equipment, and never store anything beneath or on top of the charger.

4.1 STACKING

When stacking chargers on top of each other, ensure that cabinets are bolted together using properly sized black #1/4-20 UNC hardware provided in all four corners on top cover. The floor mounting must be done with #1/4-20 UNC bolts (steel rack) or #1/4 lag screws and anchors (concrete floor). All charger models with a Z, SCRFLX-XX-XXXT1Z or SCRFLX-XX-XXX-S1Z, can be stacked to a maximum of three high.

WARNING: THE ABOVE PROCEDURES MUST BE FOLLOWED EXACTLY TO AVOID INJURY OR RISK OF ELECTRIC SHOCK.

WARNING: TO REDUCE THE RISK OF FIRE, INSTALL BATTERY CHARGER ON A FLOOR OF NON-COMBUSTIBLE MATERIAL, SUCH AS

STONE, BRICK, CONCRETE OR METAL. IF THIS IS NOT AVAILABLE, A FLOOR PLATE OF AT LEAST 1.43mm GALVANIZED OR 1.6mm UNCOATED STEEL EXTENDED AT LEAST 150mm BEYOND THE EQUIPMENT ON ALL SIDES MUST BE INSTALLED.

5.0 AC ELECTRICAL SUPPLY

The charger must be connected to either a single phase, or three phase, 50 or 60 Hertz ($\pm 2\%$) AC power source. The following options are available:

TABLE 1 – INPUT VOLTAGE CHOICES

Single phase	Three phase
a) 120/208/240VAC, 60Hz	d) 208/240/480VAC, 60Hz
b) 208/240/480VAC, 60Hz	e) 480VAC, 60Hz
c) 240VAC, 50Hz	f) 380VAC, 50Hz
	g) 415VAC, 50Hz

Only the AC input wire configuration for multi-input chargers can be changed. Follow Figure 1 (page 4) for single phase input or Figure 2 and Figure 3 (pages 5-6) for three phase input transformers. This change should be done by a qualified electrical contractor.

5.1 AC FUSE MOUNTING

The charger comes with a fuseblock rated big enough to accommodate the highest possible current and voltage for that particular model. Proper fuse ratings can be found in Table 2 and Table 3(see pages 9-12) for AC input fuses (F1, F2 in case of a single phase input or F1, F2, F3 in case of a three phase input). Fuses with an ampere rating of 30A or less are smaller and need fuse reducers when placed in a 60A fuseblock.

5.2 INPUT VOLTAGE CHANGE

Before proceeding check which transformer tap configuration you have. When changing the taps on the input side between 1) 120, 208, 240 VAC or 2) 208, 240, 480 VAC (single phase input), be sure to change the wires and/or jumpers according to Figure 1 (page 4). Once finished, refer to Table 2 (pages 9-10) for the correct size of AC input fuses. Similarly when changing input voltage between 208, 240, 480 VAC (three phase input) follow the schematics on Figure 2 or Figure 3 (pages 5-6) whichever is applicable. Following that, check Table 3 (pages 11-12) for the correct size of AC input fuses. Figure 3 applies to 12 cell 475, 600, 750, 865 Ah; 18 cell 475, 600, 750, 865, 965, 1050 Ah; and 24 cell 475, 600, 750, 865Ah chargers only.

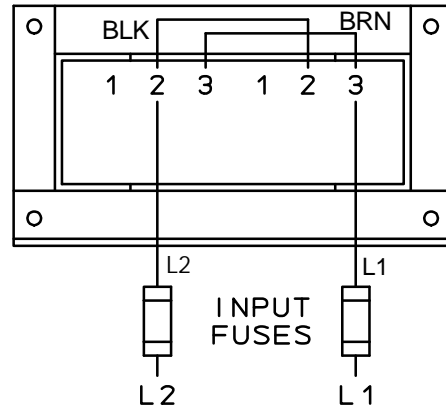
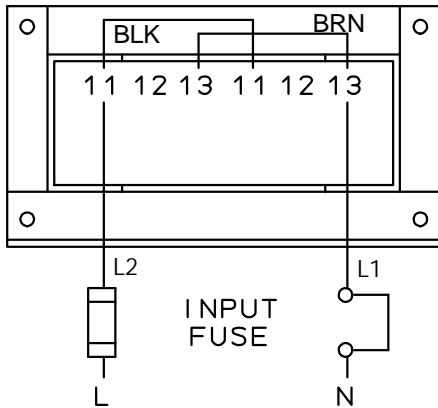
NOTE: Upon completion and proper verification of the input voltage configuration change, markings on the door label and the unit nameplate must be revised (crossing out factory set markings); re-mark the label with a permanent marker to reflect new input voltage configuration and fuse size.

FIGURE 1: SINGLE PHASE INPUT

WARNING: IMPROPER WIRE AND JUMPER CONNECTION MAY CAUSE SEVERE DAMAGE TO THE CHARGER AND BATTERY

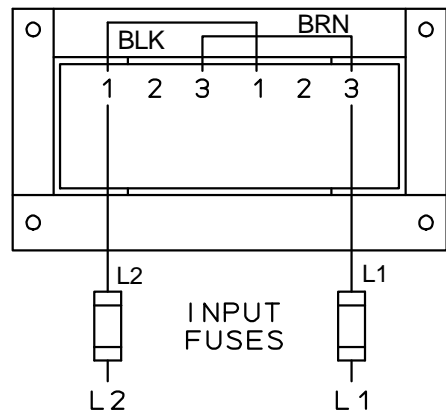
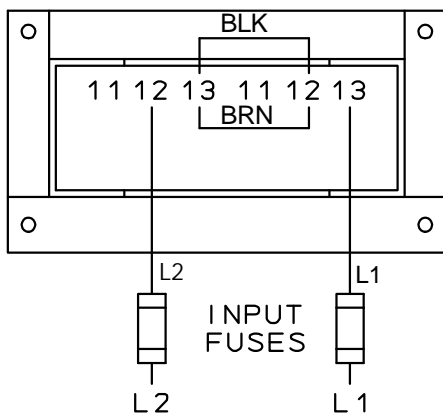
120 VAC CONFIGURATION (120/208/240V INPUT)

208 VAC CONFIGURATION (208/240/480V INPUT)



208 VAC CONFIGURATION (120/208/240V INPUT)

240 VAC CONFIGURATION (208/240/480V INPUT)



240 VAC CONFIGURATION (120/208/240V INPUT)

480 VAC CONFIGURATION (208/240/480V INPUT)

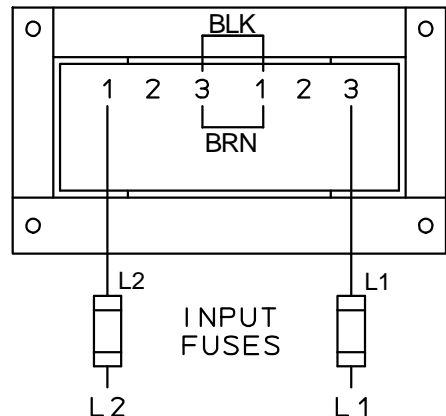
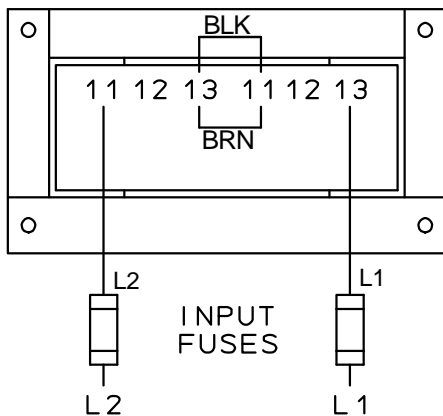
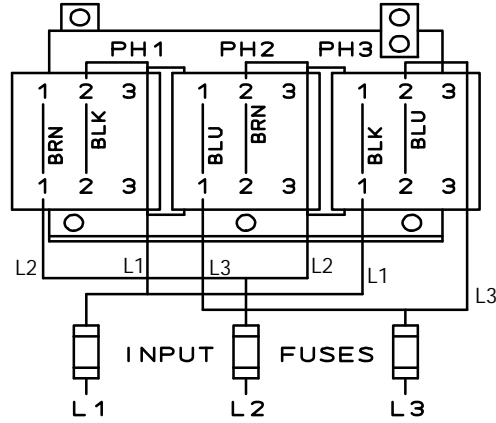


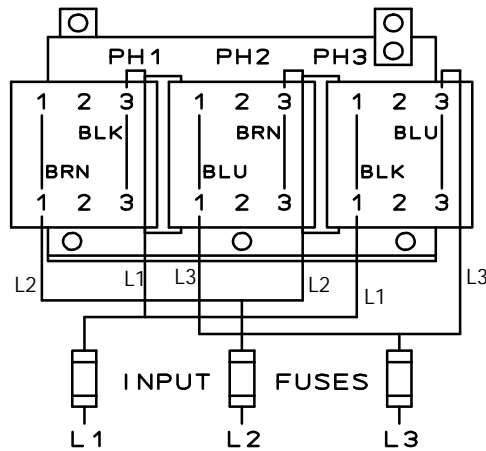
FIGURE 2: THREE PHASE INPUT

WARNING: IMPROPER WIRE AND JUMPER CONNECTION MAY CAUSE SEVERE DAMAGE TO THE CHARGER AND BATTERY

208VAC CONFIGURATION (208/240/480V INPUT)



240VAC CONFIGURATION (208/240/480V INPUT)



480VAC CONFIGURATION (208/240/480V INPUT)

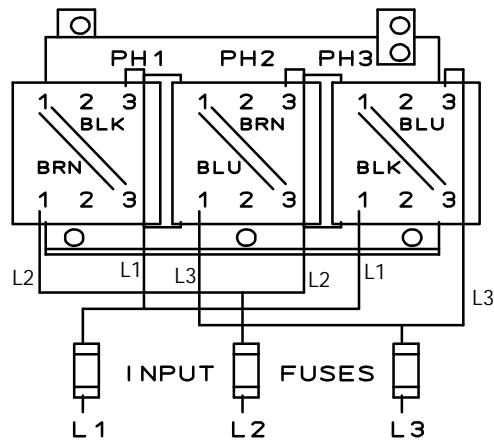
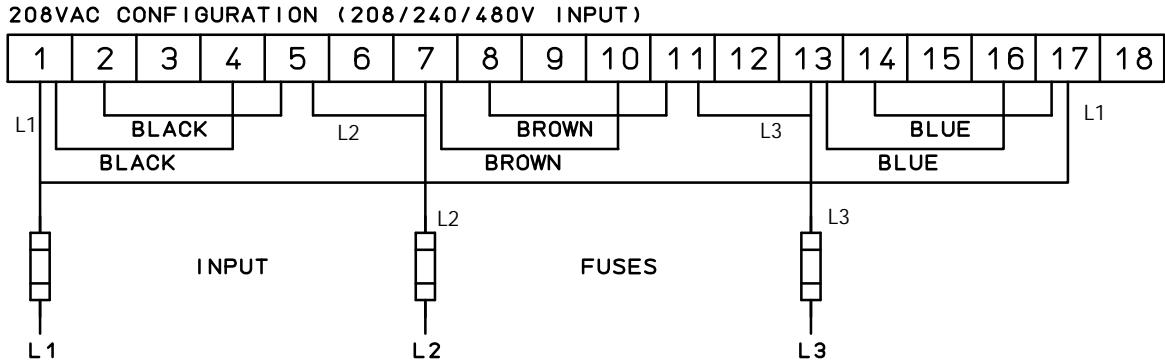


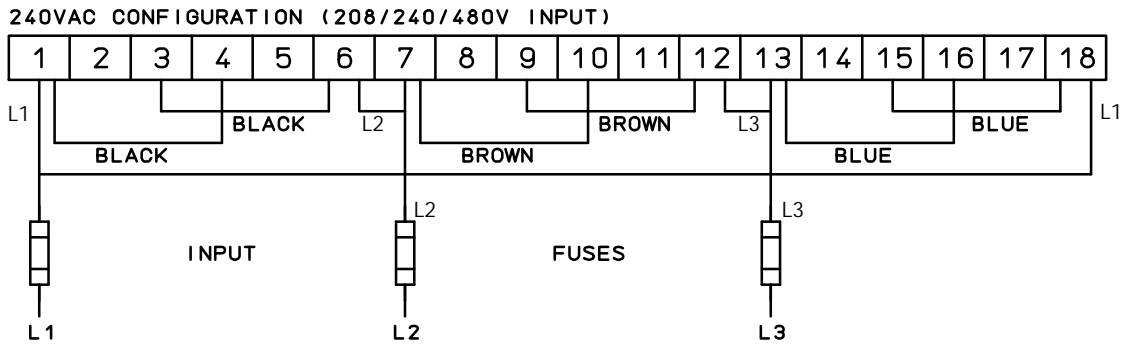
FIGURE 3: THREE PHASE INPUT

WARNING: IMPROPER WIRE AND JUMPER CONNECTION MAY CAUSE SEVERE DAMAGE TO THE CHARGER AND BATTERY

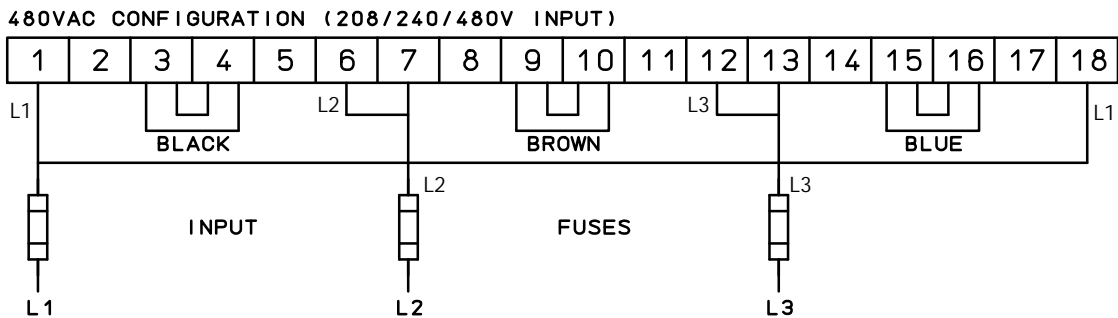
208VAC CONFIGURATION (208/240/480V INPUT) (SCRFLX- XX-XXXXT1Z ONLY)



240VAC CONFIGURATION (208/240/480V INPUT) (SCRFLX -XX-XXXXT1Z ONLY)



480VAC CONFIGURATION (208/240/480V INPUT) (SCRFLX -XX-XXXXT1Z ONLY)



5.3 AC VOLTAGE CONNECTIONS

To connect the input AC voltage, route the AC conduit through the knockout hole provided. Continue the AC wiring to fuseholder terminals L1 (N) and L2 (L) (single phase input) or L1, L2, and L3 (three phase input), ensuring that the AC source phases match the phase rotation on the AC input. For proper connection, torque the screws to approximately 25 inch-pounds.

5.4 GROUND CONNECTION

It is a requirement to ground the chassis while the charger is connected to AC power. The charger comes with a ground lug attached to the stud, clearly marked on the chassis. To ensure good continuity keep the contact area clean. The stud is designed for a 3/16" hardware. See grounding method shown below (Figure 4.).

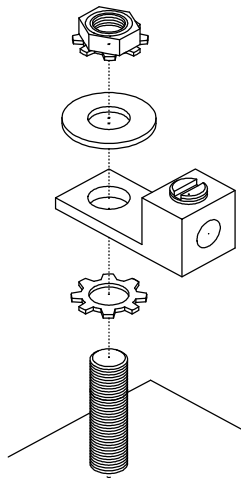
WARNING: DO NOT OPERATE THE UNIT WITHOUT PROPER GROUNDING. IMPROPER GROUNDING CAN RESULT IN THE RISK OF AN ELECTRIC SHOCK AND ELIMINATES CHARGER WARRANTY.

CAUTION: USE MINIMUM 75°C WIRING. FOR SUPPLY CONNECTIONS, GROUND CHARGER PROPERLY USING GROUNDING STUD (GND) PROVIDED. USE COPPER-CLAD ALUMINUM, ALUMINUM OR COPPER CONDUCTORS ONLY.

After electrical connection is completed, the charger is ready for operation.

NOTE: The following applies to three phase chargers only: if the charger indicates "FAC" or F3 upon start-up, it means that there is a low or high AC voltage ($\pm 35\%$) or AC phase missing. Refer to the Troubleshooting Section (Section 13, page 17) for more details.

FIGURE 4: GROUNDING METHOD



6.0 DC OUTPUT

The DC charging cable has a commonly used battery plug or receptacle. The polarity of the charger plug must be the same as the battery connector. The BLACK DC cable must be connected to the battery negative (-), and the RED DC cable must be connected to the battery positive (+). The charger will not operate in a reversed polarity condition.

The DC output fuse is a "fast-acting" fuse used to protect the power semiconductors of a charger.

NOTE: Use only identical replacement fuses obtainable from your GNB service representative

7.0 APPLICATION

The charger will automatically charge a battery per the Ah rating set at the factory. The charger can be re-set for anywhere between 65% to 200% of the nameplate Ah rating. Ensure that battery and charger are matched. Keep in mind if the charger is set for more than 100% of Ah of the charger rating the charging time will increase proportionately (up to 16 hours). For battery sizes not listed, contact your local GNB service representative.

7.1 DISPLAY AND FAULT CODES

Refer to **Appendix A** (on page 19) for a complete list of codes.

7.2 OPTIONS

7.2.1 JIC SWITCH ASSEMBLY

All SCRFLX battery chargers can come with a factory installed fused JIC switch assembly option for extra protection of the operator. In the "OFF" position, the door can be opened but only AC power at the input of the switch is present while everything downstream is dead. In the "ON" position, AC power is supplied to the charger but the door cannot be opened. See applicable drawing 4770-65-73041-05, 4770-65-73041-15 or 4770-65-73041-17 for electrical schematic (Appendix B, pages 21-31). NOTE: Only HRCI-R type fuses (ECSR or equivalent) with the notched ferrule at one end can be used. A JIC type switch can only be factory installed and it is available in a "B", "C" or "D" size cabinet.

7.2.2 BATTERY WATERING OPERATION AND END OF CHARGE

The SCRFLX battery charger has an available watering control and end of charge option, in the form of a relay contact at terminals TB10-1 to TB10-2 (supplied for customer connection). The relay closes thirty minutes after the charger reaches gassing voltage. It remains closed for approximately ten minutes.

NOTE:These options require different control cards per drawing 4120-65-68650-05 (see Appendix B, pages 21-31).

RELAY CONTACT RATINGS:

- AC: 125V 0.6A 1.0PF maximum

- DC: 30V 2A resistive maximum

7.2.3 REMOTE STOP / EQUALIZE

The SCR100 battery charger can come with a factory installed Remote Stop / Equalize assembly option (part-number V16-31365-50) in case the charger is out of reach for the operator. The end user will have to install two separate push buttons to the appropriate terminals on the Remote Stop / Equalize circuit board (see schematic 4120-66-68650-50) and locate them to a

convenient location for use. When installing the push buttons ensure that there are no corrosive fumes deteriorating the contacts. The Remote Stop / Equalize option is available for "Z" model chargers "B" and "C" cabinets, 6 – 36 cells only. For non "Z" models contact your local GNB service representative.

TABLE 2 – SINGLE PHASE TECHNICAL DATA

STANDARD MODEL SCRFLX-XX-XXXX-S1Z	DC AMPS	AC AMPS @ AC VOLTS					CABINET TYPE	WEIGHT	
			120	208	240	480		LBS	KGS
SCRFLX-06-260S1Z	40	AMPS	12	7	6	3	A	76	34.5
		FUSE	15	10	8	4			
SCRFLX-06-475S1Z (50 Hz)	74	AMPS	19	11	9.5	5	A	120	54.4
		FUSE	25	15	12	7			
	74	AMPS	X	X	9.5	X	A	130	59.1
		FUSE	-	-	12	-			
SCRFLX-06-600S1Z (50 Hz)	93	AMPS	26	15	14	7	B	190	86.2
		FUSE	35	20	20	10			
	93	AMPS	X	X	13.5	X	B	205	93.2
		FUSE	-	-	20	-			
SCRFLX-06-865S1Z	134	AMPS	C.F.	20	18	9	B	255	116
		FUSE	-	25	25	12			
SCRFLX-06-965S1Z	150	AMPS	C.F.	23	20	10	B	295	134
		FUSE	-	30	25	15			
SCRFLX-09-475S1Z	74	AMPS	26	15	14	6.5	B	160	72.5
		FUSE	35	20	20	10			
SCRFLX-09-600S1Z	93	AMPS	C.F.	19	16	8	B	210	95
		FUSE	-	25	20	10			
SCRFLX-09-865S1Z	134	AMPS	C.F.	27	23.5	12	B	260	118
		FUSE	-	35	30	15			
SCRFLX-09-965S1Z	150	AMPS	C.F.	30	26	13	B	300	136
		FUSE	-	40	35	20			
SCRFLX-12-260S1Z (50 Hz)	40	AMPS	18.5	10.5	9	5	A	120	54.4
		FUSE	25	15	12	7			
	40	AMPS	X	X	9	X	A	130	59.1
		FUSE	-	-	12	-			
SCRFLX-12-475S1Z (50 Hz)	74	AMPS	C.F.	19.5	17	8.5	B	200	90.7
		FUSE	-	25	25	12			
	74	AMPS	X	X	17	X	B	212	96.4
		FUSE	-	-	25	-			
SCRFLX-12-600S1Z (50 Hz)	93	AMPS	C.F.	25.5	22	11	B	225	102
		FUSE	-	35	30	15			
	93	AMPS	X	X	22	X	B	235	107
		FUSE	-	-	30	-			
SCRFLX-12-750S1Z	116	AMPS	C.F.	34	29	14.5	B	270	122
		FUSE	-	45	40	20			
SCRFLX-12-865S1Z	134	AMPS	C.F.	34	29	14.5	B	270	122
		FUSE	-	45	40	20			
SCRFLX-12-965S1Z	150	AMPS	C.F.	38	34	17	B	305	138
		FUSE	-	50	45	25			
SCRFLX-18-260S1Z	40	AMPS	C.F.	16	14	7	B	195	88.5
		FUSE	-	20	20	10			
SCRFLX-18-475S1Z	74	AMPS	C.F.	30	26	14	B	240	109
		FUSE	-	40	35	20			

TABLE 2 – SINGLE PHASE TECHNICAL DATA

STANDARD MODEL SCRFLX-XX-XXXX-S1Z	DC	AC AMPS @ AC VOLTS					CABINET TYPE	WEIGHT	
	AMPS		120	208	240	480		LBS	KGS
SCRFLX-18-600S1Z	93	AMPS	C.F.	36.5	31.5	16	B	260	118
		FUSE	-	50	40	20			
SCRFLX-18-750S1Z	116	AMPS	C.F.	48	44	22	C	260	118
		FUSE	-	60	60	30			
SCRFLX-18-865S1Z (50 Hz)	134	AMPS	C.F.	48	44	22	C	325	147
		FUSE	-	60	60	30			
	134	AMPS	X	X	44	X	C	340	155
		FUSE	-	-	60	-			
SCRFLX-24-260S1Z	40	AMPS	C.F.	22	19	10	B	300	135
		FUSE	-	30	25	15			
SCRFLX-24-475S1Z (50 Hz)	74	AMPS	C.F.	39	33.5	17	C	315	143
		FUSE	-	50	45	25			
	74	AMPS	X	X	33.5	X	C	340	155
		FUSE	-	-	45	-			
SCRFLX-24-600S1Z (50 Hz)	93	AMPS	C.F.	48	41	21	C	380	172
		FUSE	-	60	60	30			
	93	AMPS	X	X	41	X	C	400	182
		FUSE	X	X	60	X			

NOTE: **C.F.**: CONTACT FACTORY; **X**: NOT AVAILABLE; -: DATA NOT AVAILABLE

TABLE 3 – THREE PHASE TECHNICAL DATA

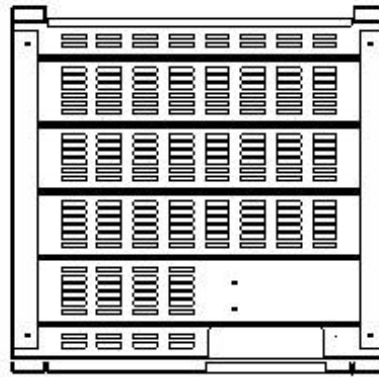
STANDARD MODEL SCRFLX-XX-XXXX-T1Z	DC AMPS	AC AMPS @ AC VOLTS						CABINET TYPE	WEIGHT	
		60Hz			50Hz		LBS		KGS	
		208	240	480	380	415				
SCRFLX-06-475T1Z	74	AMPS	5	4.5	2.2	C.F.	C.F.	B	170	77.1
		FUSE	7	6	3	-	-			
SCRFLX-06-600T1Z	93	AMPS	7	6	3.5	C.F.	3.5	B	190	86.2
		FUSE	10	8	5	-	5			
SCRFLX-06-750T1Z	116	AMPS	9	8	4	C.F.	C.F.	B	220	99.8
		FUSE	12	12	6	-	-			
SCRFLX-06-865T1Z	134	AMPS	10	9	5	C.F.	C.F.	B	220	99.8
		FUSE	15	12	7	-	-			
SCRFLX-06-965T1Z	150	AMPS	11	10	5	C.F.	C.F.	B	235	107
		FUSE	15	15	7	-	-			
SCRFLX-06-1050T1Z	163	AMPS	12	11	5.5	C.F.	C.F.	B	245	111
		FUSE	15	15	8	-	-			
SCRFLX-06-1200T1Z	186	AMPS	12.7	11	5	C.F.	C.F.	C	260	118
		FUSE	20	15	7	-	-			
SCRFLX-06-1450T1Z	225	AMPS	15	14	7	C.F.	C.F.	C	290	132
		FUSE	20	20	10	-	-			
SCRFLX-09-600T1Z	93	AMPS	12	10	5	C.F.	C.F.	B	220	99.8
		FUSE	15	15	7	-	-			
SCRFLX-12-475T1Z	74	AMPS	9	8	4	5.5	5	B	215	97.6
		FUSE	12	12	6	8	7			
SCRFLX-12-600T1Z	93	AMPS	11.5	10	5	7	7	B	220	100
		FUSE	15	15	7	10	10			
SCRFLX-12-750T1Z	116	AMPS	15	14	7	9.2	9	B	250	113.5
		FUSE	20	20	10	12	12			
SCRFLX-12-865T1Z	134	AMPS	16	14	7	10	9	B	255	116
		FUSE	20	20	10	15	12			
SCRFLX-12-965T1Z	150	AMPS	21	18	9	C.F.	C.F.	C	260	118
		FUSE	30	25	12	-	-			
SCRFLX-12-1050T1Z	163	AMPS	22	19	9.5	12	C.F.	C	270	122
		FUSE	30	25	12	15				
SCRFLX-12-1200T1Z	186	AMPS	26	22	11	C.F.	C.F.	C	298	135
		FUSE	35	30	15	-	-			
SCRFLX-12-1450T1Z	225	AMPS	30	26	14	C.F.	C.F.	C	310	141
		FUSE	40	35	20	-	-			
SCRFLX-18-260T1Z	40	AMPS	9	8	4	C.F.	C.F.	B	215	98
		FUSE	12	10	6	-	-			
SCRFLX-18-475T1Z	74	AMPS	14	11	5.5	C.F.	8	B	255	116
		FUSE	20	15	8	-	12			
SCRFLX-18-600T1Z	93	AMPS	16	14	7	C.F.	10	B / C*	300	136
		FUSE	20	20	10	-	15			
SCRFLX-18-750T1Z	116	AMPS	20	18	9	16	15	B / C*	310	141
		FUSE	30	25	12	20	20			
SCRFLX-18-865T1Z	134	AMPS	24	21	10.5	16	15	C	325	148
		FUSE	35	30	15	20	20			
SCRFLX-18-965T1Z	150	AMPS	26	22	11	18	17	C	340	155
		FUSE	35	30	15	25	25			

TABLE 3 – THREE PHASE TECHNICAL DATA

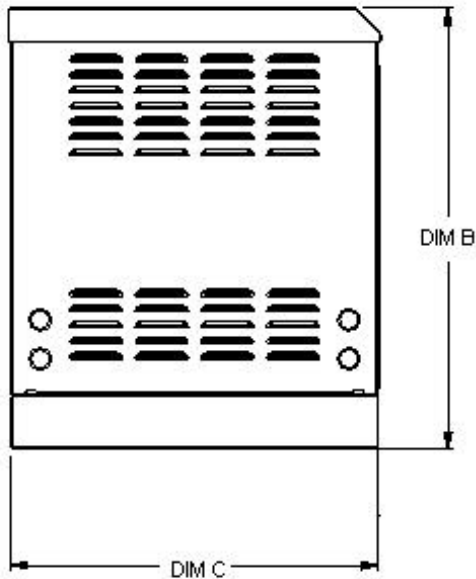
STANDARD MODEL SCRFLX-XX-XXXX-T1Z	DC AMPS	AC AMPS @ AC VOLTS						CABINET TYPE	WEIGHT	
			60Hz			50Hz			LBS	KGS
			208	240	480	380	415			
SCRFLX-18-1050T1Z	163	AMPS	28	24	12	19	17.5	C	380	163
		FUSE	40	35	15	25	25			
SCRFLX-18-1200T1Z	186	AMPS	37	32	16	26	C.F.	C	410	186
		FUSE	50	45	20	35	-			
SCRFLX-18-1450T1Z	225	AMPS	47.5	41	21	27	26	C	450	204
		FUSE	60	60	30	35	35			
SCRFLX-18-1700T1Z	264	AMPS	48	44	22	C.F.	C.F.	D	550	250
		FUSE	60	60	30	-	-			
SCRFLX-24-475T1Z	74	AMPS	17	15	7.5	C.F.	10	B / C*	290	132
		FUSE	25	20	10	-	15			
SCRFLX-24-600T1Z	93	AMPS	21	18	9.5	15	12	C	320	145
		FUSE	30	25	12	20	15			
SCRFLX-24-750T1Z	116	AMPS	28	24	12	18	15	C	345	157
		FUSE	40	35	15	25	20			
SCRFLX-24-865T1Z	134	AMPS	31	27	14	18	17.2	C	380	173
		FUSE	45	40	20	25	25			
SCRFLX-24-965T1Z	150	AMPS	40	36	18	C.F.	20	C	400	182
		FUSE	60	50	25	-	30			
SCRFLX-24-1050T1Z	163	AMPS	44	38	18.5	24	22	C	425	193
		FUSE	60	50	25	35	30			
SCRFLX-24-1200T1Z	186	AMPS	48	46	23	28	C.F.	C	440	200
		FUSE	60	60	30	40	-			
SCRFLX-24-1450T1Z	225	AMPS	C.F.	C.F.	27	27	22	C	490	222
		FUSE	-	-	35	35	30			
SCRFLX-24-1700T1Z	264	AMPS	C.F.	C.F.	31	31	25	D	525	239
		FUSE	-	-	40	40	35			
SCRFLX-36-475T1Z	74	AMPS	34	29	14.5	C.F.	C.F.	C	330	150
		FUSE	45	40	20	-	-			
SCRFLX-36-600T1Z	93	AMPS	41	35	18	21	20.5	C	420	190
		FUSE	60	50	25	35	30			
SCRFLX-36-750T1Z	116	AMPS	46	40	20	C.F.	27	C	460	209
		FUSE	60	60	30	-	35			
SCRFLX-36-865-T1Z	134	AMPS	C.F.	46.5	23	C.F.	27	C	480	218
		FUSE	-	60	30	-	35			
SCRFLX-36-965-T1Z	150	AMPS	C.F.	C.F.	27	C.F.	29.4	C	500	227
		FUSE	-	-	40	-	40			
SCRFLX-36-1450-T1Z	225	AMPS	C.F.	C.F.	37	C.F.	42	D	550	250
		FUSE	-	-	50	-	60			
SCRFLX-40-475-T1Z	74	AMPS	39	34	17	C.F.	19.5	C	450	204
		FUSE	50	45	25	-	25			
SCRFLX-40-1200-T1Z	186	AMPS	C.F.	C.F.	33	C.F.	C.F.	D	500	227
		FUSE	-	-	45	-	-			
SCRFLX-48-600-T1Z	93	AMPS	48	42	21	C.F.	C.F.	D	550	250
		FUSE	60	60	30	-	-			
SCRFLX-48-865-T1Z	134	AMPS	C.F.	C.F.	C.F.	C.F.	C.F.	D	600	272
		FUSE	-	-	-	-	-			

NOTE: **C.F.**: CONTACT FACTORY; **X**: NOT AVAILABLE - : DATA NOT AVAILABLE; *: 50Hz MODELS ARE IN A "C" CABINET

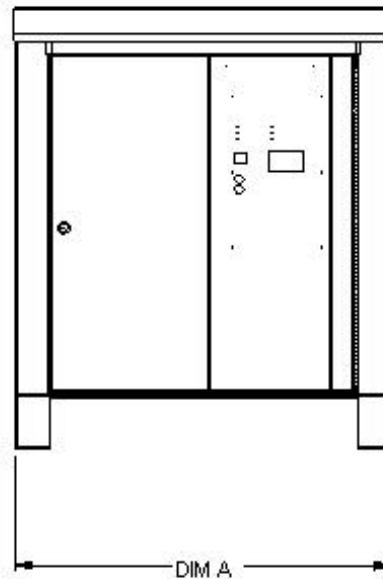
8.0 CABINET OUTLINE/DIMENSIONS FOR -Z MODEL CHARGERS ONLY



BOTTOM VIEW



SIDE VIEW



FRONT VIEW

CABINET	DIM. A	DIM. B	DIM. C
A	15.10"	20.65"	12.75"
B	22.70"	26.65"	22.25"
C	32.10"	26.65"	22.25"
D	24.30"	42.00"	23.65"
D (Mining)	24.30"	42.00"	23.65"
E (Mining)	24.30"	59.00"	31.50"

NOTE: Mining chargers are equipped with a drip cap and four lifting eyebolts for sling lifting. Add an additional 5.000" to the height. (DIM.B)

9.0 SCRFLX CHARGER OPERATION

LED	DISPLAY	DESCRIPTION
(NONE)	OFF FLd*	PLUG IN THE BATTERY TO COMMENCE CHARGING CHARGER SET FOR FLOODED BATTERIES
DELAY (Orange), dEL, then delay time remaining in Hours. minutes	OFF dEL time	DELAY MODE, PRESS "START" BUTTON TO OVERRIDE. (Section 9.1.1, page 15)
CHARGING (Orange)	XXX	HIGH RATE CHARGING
	(DISPLAY OF CHARGE CURRENT)	
80% CHARGED (Yellow)	XXX	FINISH RATE CHARGING
	(DISPLAY OF FINISH RATE CURRENT)	
FAULT (Red)	OFF	CHARGE CYCLE WAS INTERRUPTED BY PRESSING "STOP" BUTTON BEFORE UNPLUGGING THE BATTERY
FAULT (Red)	OFF/ XXX	FAULT CONDITION EXISTS. UNPLUG THE BATTERY AND GO TO APPENDIX A FOR DETAILS. *OTHER INDICATION DISPLAYED (i.e. FAC, Fdc, Lo, HI, etc.)
CHARGE COMPLETE (Green) flashing, remaining cooldown time displayed in Hours.minutes	OFF CoL* time	CHARGING IS COMPLETE. ONCE COOLDOWN TIME IS FINISHED, UNPLUG THE BATTERY.
CHARGE COMPLETE (Green) on, remaining refresh time displayed in Hours. minutes	OFF rFr* time	BATTERY CAN BE UNPLUGGED AND USED.*
EQUALIZE (Orange)	XXX	PRESS "EQUALIZE" BUTTON TO EQUALIZE THE BATTERY. PRESS AGAIN TO CANCEL.
	(DISPLAY OF CHARGE CURRENT)	

*THESE DISPLAYS OR OPTIONS ARE AVAILABLE ONLY ON Z MODEL CHARGERS OR REPLACEMENT BOARDS

9.1 SCRFLX CHARGER FUNCTIONAL DESCRIPTION

This section gives a brief description of each LED, pushbutton, and the delay function on the SCRFLX type charger front control panel.

9.1.1 DELAY STAGE

9.1.1.1 DELAY CIRCUIT

CAUTION: HAZARDOUS VOLTAGES INSIDE. DO NOT ATTEMPT TO CHANGE THE SLIDE SWITCHES ON THE CONTROL CARD UNTIL ALL AC POWER IS DISCONNECTED FROM THE UNIT AS WELL AS THE BATTERY IS UNPLUGGED FROM THE CHARGER. USE PROPER TOOL TO OPEN THE CABINET DOOR.

1. The delay circuit enables the user to set a delay of up to eight hours between battery plug in and the start of charge.
2. The delay time must be set prior to charging. This can be done via the slide switches located on the back of the charger control card. Refer to Table 4 below for details.

CAUTION: DO NOT TOUCH THE OTHER SLIDE SWITCHES ON THE BACK OF THE CONTROL BOARD. THESE ARE FACTORY SET AND CAN ONLY BE CHANGED BY A QUALIFIED GNB SERVICE REPRESENTATIVE.

TABLE 4

SW5	1	2	3	4	START DELAY (HOURS)
	ON	ON	ON	ON	0 (DEFAULT)
	OFF	ON	ON	ON	1
	ON	OFF	ON	ON	2
	OFF	OFF	ON	ON	3
	ON	ON	OFF	ON	4
	OFF	ON	OFF	ON	5
	ON	OFF	OFF	ON	6
	OFF	OFF	OFF	ON	8

9.1.1.2 DELAY LED

This LED indicates that the charger is in the delay mode and charging will not start until the delay time has elapsed. A flashing Delay LED indicates that the delay is in progress.

9.1.1.3 START DELAY OVERRIDE

This pushbutton will override the charger delay mode and charging will start immediately.

9.1.2 CHARGING

9.1.2.1 CHARGING LED

This LED indicates that the charger is ON.

9.1.2.2 80 % CHARGED LED

This LED indicates that the battery has reached 80% charge.

9.1.2.3 CHARGE COMPLETE LED

When this LED is continuously lit it indicates that the charging cycle is complete. The battery may now be safely disconnected. In the event this LED is flashing, it indicates that cooldown is in progress.

9.1.2.4 FAULT LED

This LED is associated with any fault that is described in Appendix A **LIST OF DISPLAY INDICATIONS** (page 19). It indicates that there is a problem prior to or during the battery charging operation.

9.1.3 DISPLAY

The display shows the charging current to the battery during the charging process. The display will show additional messages as the charging is progressing or a fault occurs.

9.1.4 STOP PUSHBUTTON

This pushbutton will STOP the charge cycle. The battery can then be safely unplugged. The red fault LED will light to indicate that the charge cycle was interrupted.

9.1.5 BATTERY COOLDOWN OPERATION STAGE

A cooldown period is incorporated in the charge cycle. This stage serves to cool down the battery before being placed back in service. During this time the display will alternate between "COL" and time remaining in this stage. If battery is unplugged during cooldown the display will show "OFF". During cooldown period, Equalize can be activated by pressing the Equalize button. If this occurred, cooldown will not start until after Equalize charging is complete.

9.1.6 REFRESH CHARGE STAGE

If a battery is left connected to the charger after cooldown, the charger will go into a refresh charge mode. This means that 24 hours after a charging was finished the battery will get a refresh charging for 10 minutes every 24 hours, at finish rate current.

9.1.7 EQUALIZE STAGE

9.1.7.1 EQUALIZE PUSHBUTTON

This pushbutton when pressed will extend the charge cycle by 3.5 hours in the equalize mode after the finish rate time has expired. If pressed a second time, it will cancel the equalize charge mode.

CAUTION: DO NOT EQUALIZE MORE OFTEN THAN REQUIRED BY THE CONDITION OF THE BATTERY, AS SPECIFIED IN THE BATTERY MAINTENANCE INSTRUCTIONS. EXCESSIVE EQUALIZING MAY DAMAGE THE BATTERY.

9.1.7.2 EQUALIZE LED

This LED indicates that the equalize mode has been selected. A flashing equalize LED indicates that it is in process.

10.0 CHARGE TIME

The amount of time a battery charges will vary depending on the depth of discharge (DOD). Once the battery has reached 80% charge, the cycle will be terminated in 3.5 hours (in case of an 8 hour charge time) or less if terminated by dv/dt . Normal charge cycles will average about 8 hours total.

11.0 AC POWER FAILURE

If the AC power fails during a charge cycle the charger will resume operation in progress as soon as the AC power is restored.

12.0 MAINTENANCE

The charger requires minimum maintenance. **ENSURE THE CHASSIS IS SECURELY GROUNDED** per the local/federal Electrical Code. Do not allow excessive dust to accumulate on the components inside. Blow out with clean compressed air when necessary.

The AC input and DC output of the charger are fused and should these fuses fail, the cause of the failure must be determined and corrected before the fuse(s) is (are) replaced. Never replace the fuse(s) with one of a higher capacity than the one originally fitted (see Tables 2 and 3 pages 9-12).

13.0 SCRFLX TROUBLESHOOTING

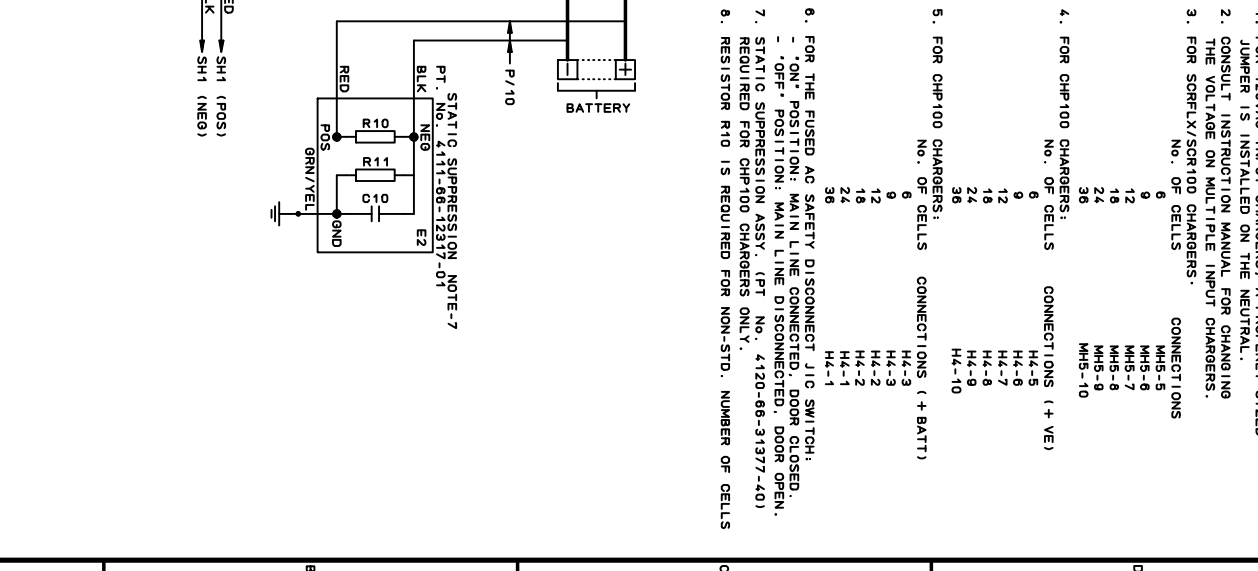
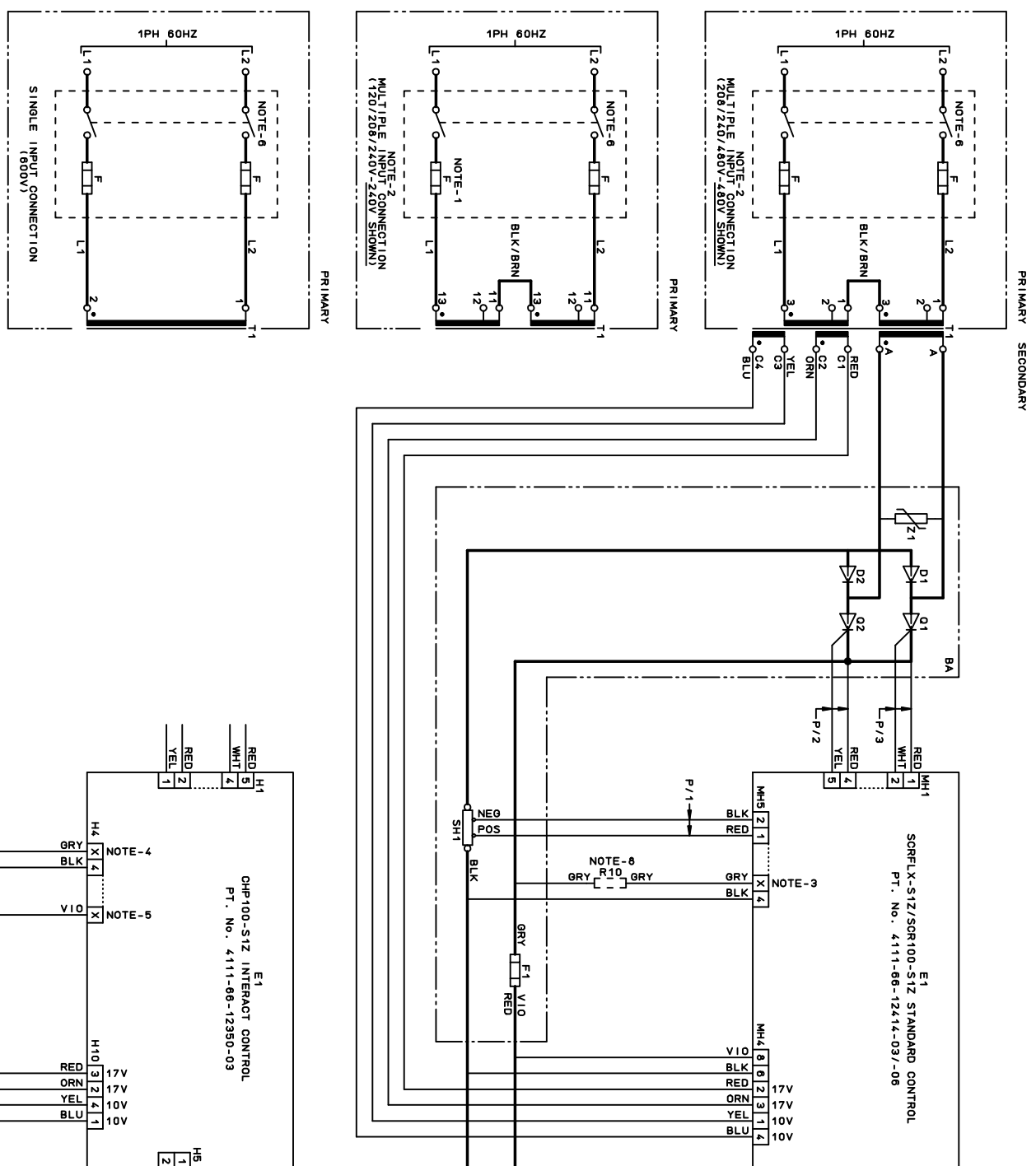
1.Symptom =>		NO DISPLAY INDICATION AFTER CONNECTION OF AC POWER
	Possible Cause	Action
1.1	Charger connected to low AC voltage.	Verify AC voltage per nameplate of the charger and electrician's tag. Verify connection of primary windings of power transformer and AC fuses of charger per connected AC voltage and electrician's tag.
1.2	Charger connected to high AC voltage.	Verify AC voltage per nameplate of the charger and electrician's tag. Verify connection of primary windings of power transformer and AC fuses of charger per connected AC voltage and electrician's tag. Check AC fuses of charger and replace if needed. Check fuse F2 of Control Card. If this fuse is blown, replace Control Card.
2. Symptom =>		DISPLAY INDICATES FAC OR F3 AFTER CONNECTION OF AC POWER
	Possible Cause	Action
2.1	Charger connected to low / high AC voltage.	Verify AC voltage per nameplate of the charger and electrician's tag. Verify connection of primary windings of power transformer and AC fuses of charger per connected AC voltage and electrician's tag.
2.2	AC power partially missing.	Verify AC voltage at all primary windings of power transformer and AC fuses of charger per nameplate of the charger and electrician's tag.
2.3	Failure of one or more of charger's power fuses.	Consult GNB technician. Replace fault fuse. Verify input AC voltage and output High Rate current.
2.4	Phase rotation. (Only if F3 is showing)	Verify phase sequence of input AC source. Ensure that it follows the sequence indicated at the charger's input.
3. Symptom =>		DISPLAY INDICATES FDC BEFORE CONNECTION OF BATTERY.
	Possible Cause	Action
3.1	Charge cycle was interrupted during charge by DC cable disconnection with slow / bouncing disconnection of DC plug.	Do not interrupt charge by DC cable disconnection. Use pushbutton Stop for this purpose. Disconnection of DC cable during charge is not safe because it produces electrical arc. If DC cable disconnection is used, disconnect cable as fast as possible; never connect battery before indication OFF appears at display (takes about 2 s after disconnection of DC cable). Disconnect battery and AC power for 5 sec. Return AC power and then connect battery.
3.2	Charge cycle was interrupted by DC cable disconnection during charge. Additionally, a battery was connected back before charger displayed OFF. Indication FdC and FAULT LED is on.	See above

3.3	Charger's DC fuse blown. Indication FdC and FAULT LED is on.	Disconnect battery and AC power. Consult GNB technician.
4. Symptom => CHARGING LED DOES NOT LIGHT ON AFTER BATTERY CONNECTION		
	<i>Possible Cause</i>	<i>Action</i>
4.1	Connection between charger and battery open.	Repair or clean battery lugs. Repair and/or change charger and /or battery DC cables and contacts of DC connectors.
4.2	Battery with wrong number of cells connected to a charger. Indication LO/rEJ or HI/rEJ and FAULT LED is on.	Replace with correct battery.
4.3	Battery voltage too low. Indication LO/rEJ and FAULT LED is on.	Consult GNB technician.
4.4	A charger operates at Delay. Indication dEL/Remaining Delay Time, LED Delay is on.	Wait till end of Delay or press pushbutton Start.
5. Symptom => DISPLAY INDICATES FCC OR F2 AT THE END OF CHARGE CYCLE		
	<i>Possible Cause</i>	<i>Action</i>
5.1	Battery failed to reach gassing voltage.	Consult GNB technician. Check matching of charger and battery: Ah, type.
6. Symptom => DISPLAY INDICATES FAC OR F3 DURING CHARGE CYCLE		
	<i>Possible Cause</i>	<i>Action</i>
6.1	Complete or partial loss of AC power.	Wait until AC returns: charger will automatically complete charge cycle. If needed, battery may be disconnected during AC failure.
6.2	Failure of one or more of charger's power fuses.	Consult GNB technician. Replace fault fuse. Verify input AC voltage and output High Rate current.
6.3	Failure of Control Card.	Consult GNB technician. Verify input AC voltage. Replace fault Control Card.
7. Symptom => DISPLAY INDICATES OFF (ONLY) AND FAULT LED IS ON		
	<i>Possible Cause</i>	<i>Action</i>
7.1	Pushbutton Stop interrupted charge cycle.	Use pushbutton Stop only when you want interrupt charge cycle or disconnect battery. Charger will start automatically after connection of next battery.
8. Symptom => DISPLAY INDICATES FCS AFTER CONNECTION ON BATTERY		
	<i>Possible Cause</i>	<i>Action</i>
8.1	Charger control board was set improperly. Prior to connection the display indicated OFF/CHP not OFF/FId	Call your local GNB representative for procedure to change this setting.

APPENDIX A: SCRFLX BATTERY CHARGERS. LIST OF DISPLAY INDICATIONS.

Indication	Abbreviation	Interpretation
1.00	1 hour delay set	Delay before charge starts
2.00	2 hour delay set	Delay before charge starts
3.00	3 hour delay set	Delay before charge starts
4.00	4 hour delay set	Delay before charge starts
5.00	5 hour delay set	Delay before charge starts
6.00	6 hour delay set	Delay before charge starts
8.00	8 hour delay set	Delay before charge starts
CHP	CH amp P ion	Control board is set to 2.55VPC not 2.70VPC.
COL	CO o L Down	Charger operates at Cool Down Stage
dEL	dE Lay	Delay set or Charger operates at Delay Stage
End	End	Charge Cycle complete
FAC or F3	F ailure of AC power	Failure of mains
FCA	F ailure of DC CA ble disconnection	DC cable disconnected from the battery during the charge
FCC or F2	F ailure of C harge C ycle	Battery failed to reach Gassing Voltage (Stage 2) or Battery failed to reach End Voltage (Stage 3 of OPC)
FCd	F ailure of C ool d own	Battery unplugged during Cool Down Stage
FdC	F ailure of dC Fuse	Output DC Fuse Failure
FFF	F ... F atal F ailure	Fatal Failure of the charger (Overvoltage or Overcurrent protection or multifunction of Start Stop signal)
FOC	F ailure of O verall C harge timer	Overall charge cycle timer protection
FLd	F Looded	Charger set for Flooded batteries
HI	H igh Voltage Rejection	Battery connected has voltage more than 2.25VPC
LO	L Ow Voltage Rejection	Battery connected has voltage less than 1.70VPC
OFF	OFF	Charger is OFF
rEJ	rE Ject	Battery connected has voltage too low or too high or Battery failed to reach 1.70VPC after 5 min of charge
rFr	rE Fr eshing Stage	Charger operates at Refreshing Stage

APPENDIX B: ELECTRICAL SCHEMATIC DRAWINGS
Pages 21-31



- NOTES
1. FOR 120VAC INPUT CHARGERS, A PROPERLY SIZED JUMPER IS INSTALLED ON THE NEUTRAL.
 2. CONSULT INSTRUCTION MANUAL FOR CHANGING THE VOLTAGE ON MULTIPLE INPUT CHARGERS.
 3. FOR SORFLX/SOR100 CHARGERS:

No. OF CELLS	CONNECTIONS
6	MHS-5
9	MHS-6
12	MHS-7
16	MHS-8
24	MHS-9
36	MHS-10
 4. FOR CHP100 CHARGERS:

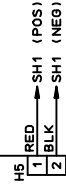
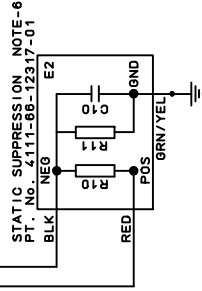
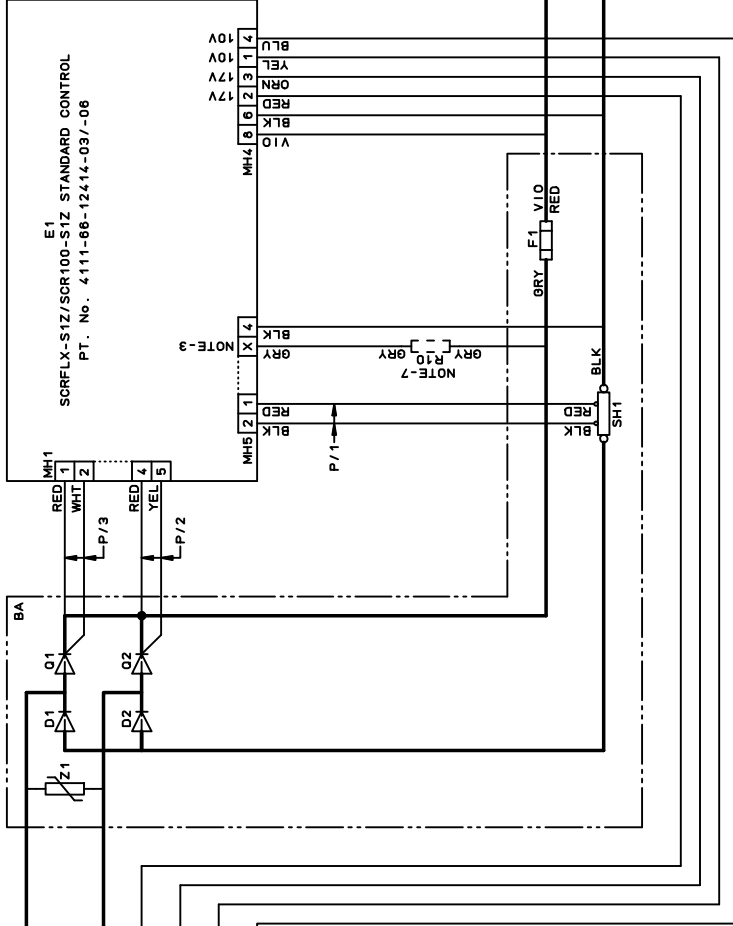
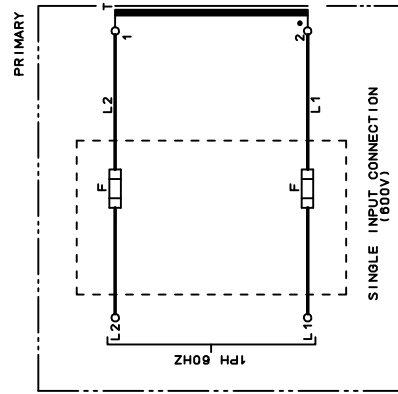
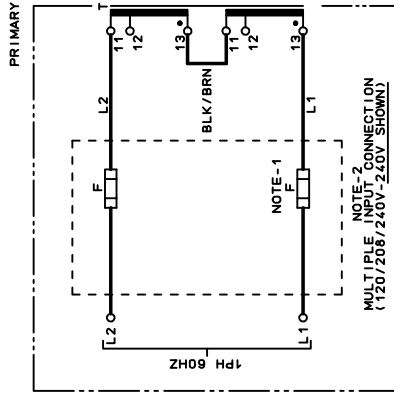
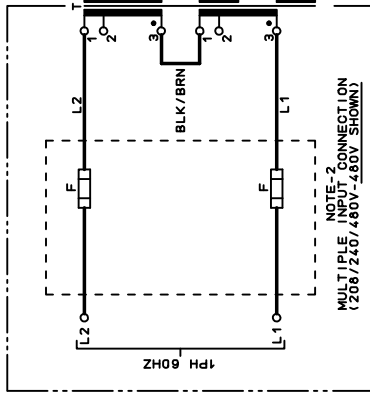
No. OF CELLS	CONNECTIONS (+ V/E)
6	H4-5
9	H4-6
12	H4-7
16	H4-8
24	H4-9
36	H4-10
 5. FOR CHP100 CHARGERS:

No. OF CELLS	CONNECTIONS (+ BATT)
6	H4-3
9	H4-4
12	H4-5
16	H4-6
24	H4-7
36	H4-8
 6. FOR THE FUSED AC SAFETY DISCONNECT JIC SWITCH:
 - ON POSITION: MAIN LINE CONNECTED, DOOR CLOSED.
 - OFF POSITION: MAIN LINE DISCONNECTED, DOOR OPEN.
 7. STATIC SUPPRESSION ASSY. (PT No. 4120-66-31377-40) REQUIRED FOR CHP100 CHARGERS ONLY.
 8. RESISTOR R10 IS REQUIRED FOR NON-STD. NUMBER OF CELLS.

REV 1 DATE 2001-12-13
 REVISION AS PER ECA 01-448
 c.c.g.

INPUT	SORFLX-S1Z/SOR100-S1Z/CHP100-S1Z
OUTPUT	BATTERY CHARGER SINGLE PHASE INPUT
CUSTOMER	(JIC OPTION)
CUSTOMER ORDER NO.	
MANUF. ORDER NO.	
JOB No.	4770-65-73041-02
DWG No.	4770-65-73041-02
SCALE	
DATE	1999-07-12
APPR BY	JKC
CHEK BY	
SHEET	REV 1

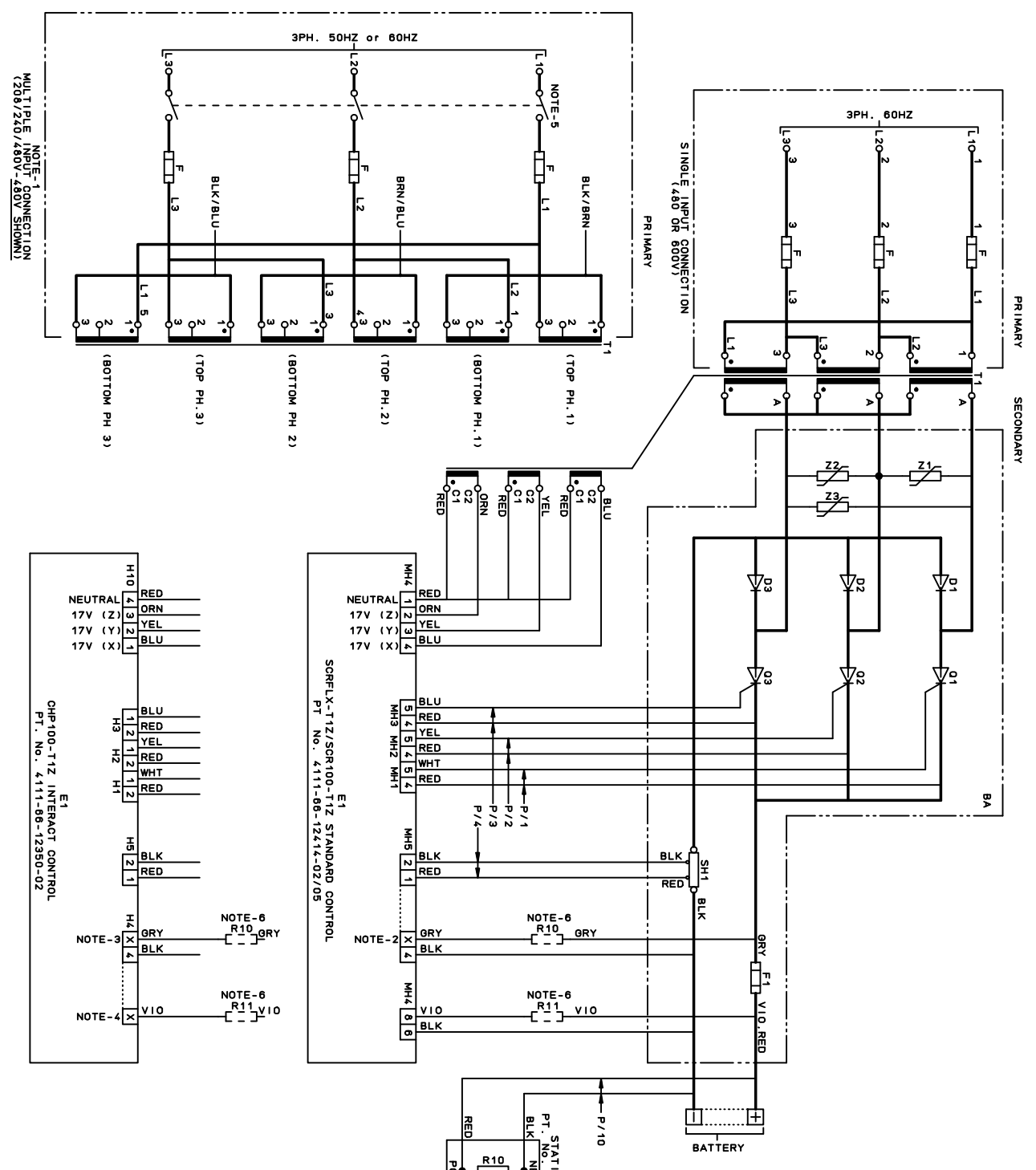
PRIMARY SECONDARY



- NOTES
- FOR 120VAC INPUT CHARGERS, A DUMMY FUSE IS INSTALLED ON THE NEUTRAL.
 - CONSULT INSTRUCTION MANUAL FOR CHANGING THE VOLTAGE ON MULTIPLE INPUT CHARGERS.
 - FOR SCRFLX/SCR100 CHARGERS - CONNECTIONS
No. OF CELLS
MH5-5
MH5-6
MH5-7
MH5-8
MH5-9
MH5-10
 - FOR CHP100 CHARGERS: CONNECTIONS (+ VE)
No OF CELLS
H4-5
H4-6
H4-7
H4-8
H4-9
H4-10
 - FOR CHP100 CHARGERS: CONNECTIONS (+ BATT)
No OF CELLS
H4-3
H4-9
H4-2
H4-2
H4-1
H4-1
H4-1
 - STATIC SUPPRESSION ASSY. (PT No. 4120-86-31377-40) REQUIRED FOR CHP100 CHARGERS ONLY.
 - RESISTOR R10 IS REQUIRED FOR NON-STD. NUMBER OF CELLS.

REV 1	DATE 1 2001-12-13	REVISED AS PER EOA 01-448	DATE
REV 1	DATE 1999-07-12	APPR BY	SCALE
REV 1	DATE 1999-07-12	CHKD BY	DWG No. 4770-65-7304.1-00
JOB No.			
MANUF. ORDER No.			
CUSTOMER ORDER No.			
OUTPUT			
INPUT			
SCHEMATIC			
SCRFLX-S1Z/SCR100-S1Z/CHP100-S1Z			
BATTERY CHARGER SINGLE PHASE INPUT			

- NOTES**
- CONSULT INSTRUCTION MANUAL FOR CHANGING
 - THE INPUT VOLTAGE ON MULTIPLE INPUT CHARGERS.
NO. OF CELLS CONNECTIONS
 - FOR SGRFLX/SOR100 CHARGERS:
9 MH3-9
12 MH5-9
16 MH5-6
24 MH5-9
36 MH5-10
 - FOR OHP-100 CHARGERS:
9 CONNECTIONS (+ VE)
12 H4-9
16 H4-7
24 H4-6
36 H4-9
H4-10
 - FOR OHP-100 CHARGERS:
NO. OF CELLS CONNECTIONS (+ BATT)
 - FOR THE FUSED AC SAFETY DISCONNECT JIC SWITCH:
- 'ON' POSITION: MAIN LINE CONNECTED, DOOR CLOSED.
- 'OFF' POSITION: MAIN LINE DISCONNECTED, DOOR OPEN.
 - EXTERNAL RESISTORS R10 & R11 ARE REQUIRED FOR NON-STD. NUMBER OF CELLS BATTERY CHARGERS.
 - STATIC SUPPRESSION ASSY. (PT. No. 4120-66-31377-40) REQUIRED FOR OHP-100 CHARGERS ONLY.



REV 1 DATE 2001-07-26
 REVISION AS PER ECA 01-263
 d.c.g. jg

REV 1 DATE 2001-12-13
 REVISION AS PER ECA 01-448
 d.c.g.

NOTE 1
 MULTIPLE INPUT CONNECTION
 (208/240/480V/480V/480V SHOWN)

NOTE 2
 (TOP PH. 1)
 (BOTTOM PH. 1)
 (TOP PH. 2)
 (BOTTOM PH. 2)
 (TOP PH. 3)
 (BOTTOM PH. 3)

NEUTRAL
 17V (Z) RED
 17V (Y) ORN
 17V (X) YEL
 17V (X) BLU

H10 1 2 3 1 2 1
 H3 H2 H1
 H5 2 1
 H4 X 4
 H4 X 4
 V10

NOTE 3
 GRY
 BLK

NOTE 4
 V10

NOTE 6
 R10 GRY
 R11 V10

NOTE 7
 STATIC SUPPRESSION NOTE-7
 PT. No. 4111-66-12317-01

INPUT
 OUTPUT
 CUSTOMER
 CUSTOMER ORDER NO.
 MANUF. ORDER NO.
 JOB No.

SCHEMATIC
 SGRFLX-T1Z/SOR100-T1Z/OHP-100-T1Z
 BATTERY CHARGER THREE PHASE INPUT
 (JIC OPTION)

DWG No. 4770-65-73041-11 SHEET 2

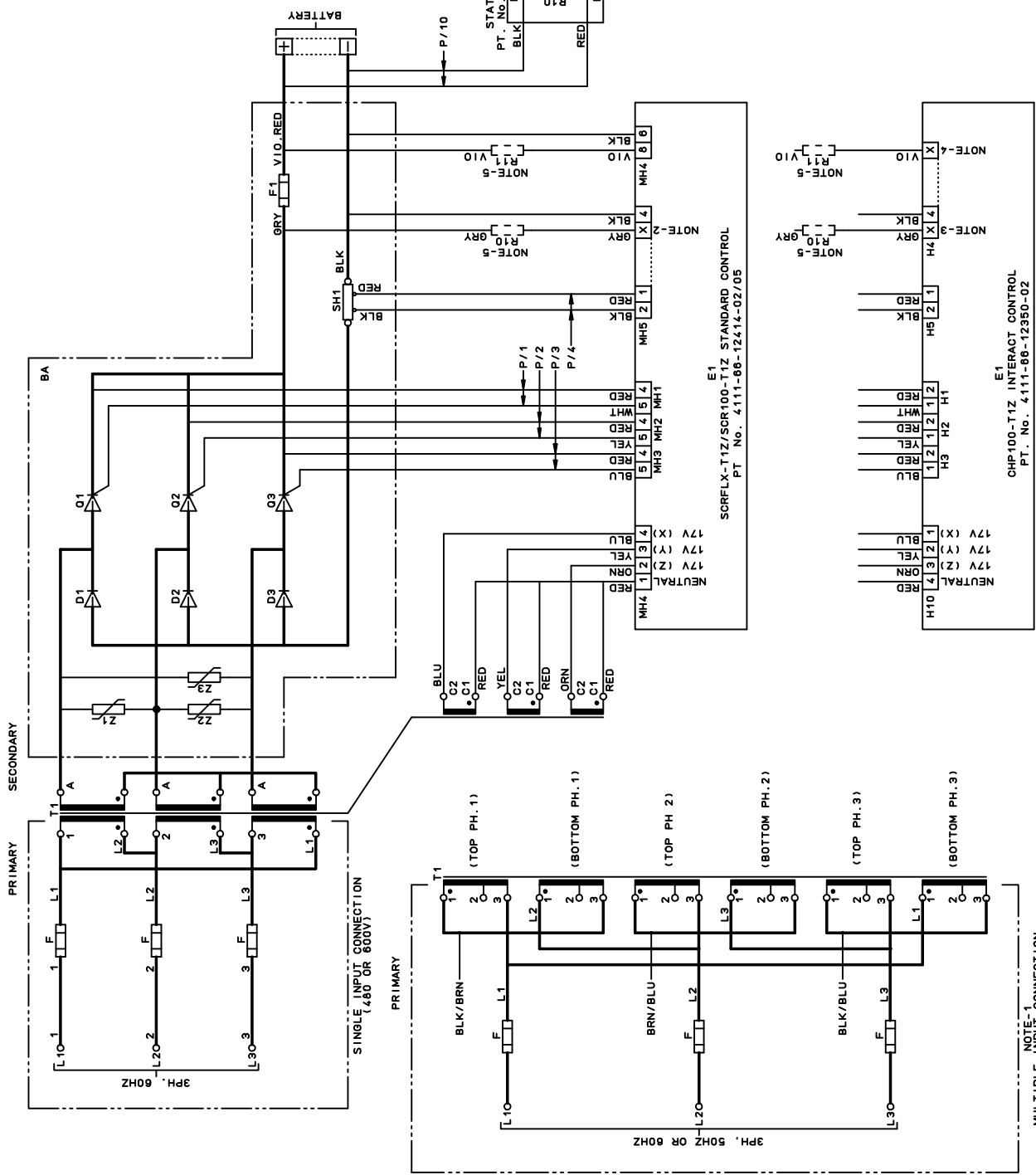
DATE 1999-07-12 APPR BY 382
 DWN BY d.c.g. CHKD BY

- NOTES**
1. CONSULT INSTRUCTION MANUAL FOR CHANGING THE INPUT VOLTAGE ON MULTIPLE INPUT CHARGERS.
 2. FOR SCRFLX/SCR100 CHARGERS:

CONNECTIONS	
No. OF CELLS	
MHS-5	6
MHS-7	9
MHS-8	12
MHS-6	18
MHS-9	24
MHS-10	36
 3. FOR CHP100 CHARGERS:

CONNECTIONS (+ VE)	
No. OF CELLS	
H4-8	6
H4-7	9
H4-6	12
H4-8	18
H4-9	24
H4-10	36
 4. FOR CHP100 CHARGERS:

CONNECTIONS (+ BATT)	
No. OF CELLS	
H4-3	6
H4-2	9
H4-2	12
H4-1	18
H4-1	24
H4-1	36
 5. EXTERNAL RESISTORS R10 & R11 ARE REQUIRED FOR NON-STD NUMBER OF CELLS BATTERY CHARGERS.
 6. STATIC SUPPRESSION ASSY. (PT. No. 4120-86-31377-40) REQUIRED FOR CHP100 CHARGERS ONLY.



REV 1	DATE 12-13-2001	DESIGNED AS PER ECA 01-478	DATE
REV 2	DATE	DESIGNED AS PER	DATE
REV 3	DATE	DESIGNED AS PER	DATE
REV 4	DATE	DESIGNED AS PER	DATE
REV 5	DATE	DESIGNED AS PER	DATE
REV 6	DATE	DESIGNED AS PER	DATE
REV 7	DATE	DESIGNED AS PER	DATE
REV 8	DATE	DESIGNED AS PER	DATE
REV 9	DATE	DESIGNED AS PER	DATE
REV 10	DATE	DESIGNED AS PER	DATE
REV 11	DATE	DESIGNED AS PER	DATE
REV 12	DATE	DESIGNED AS PER	DATE
REV 13	DATE	DESIGNED AS PER	DATE
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REV 15	DATE	DESIGNED AS PER	DATE
REV 16	DATE	DESIGNED AS PER	DATE
REV 17	DATE	DESIGNED AS PER	DATE
REV 18	DATE	DESIGNED AS PER	DATE
REV 19	DATE	DESIGNED AS PER	DATE
REV 20	DATE	DESIGNED AS PER	DATE
REV 21	DATE	DESIGNED AS PER	DATE
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REV 94	DATE	DESIGNED AS PER	DATE
REV 95	DATE	DESIGNED AS PER	DATE
REV 96	DATE	DESIGNED AS PER	DATE
REV 97	DATE	DESIGNED AS PER	DATE
REV 98	DATE	DESIGNED AS PER	DATE
REV 99	DATE	DESIGNED AS PER	DATE
REV 100	DATE	DESIGNED AS PER	DATE

SCHEMATIC
 SCRFLX-T1Z/SCR100-T1Z/CHP100-T1Z
 BATTERY CHARGER THREE PHASE INPUT

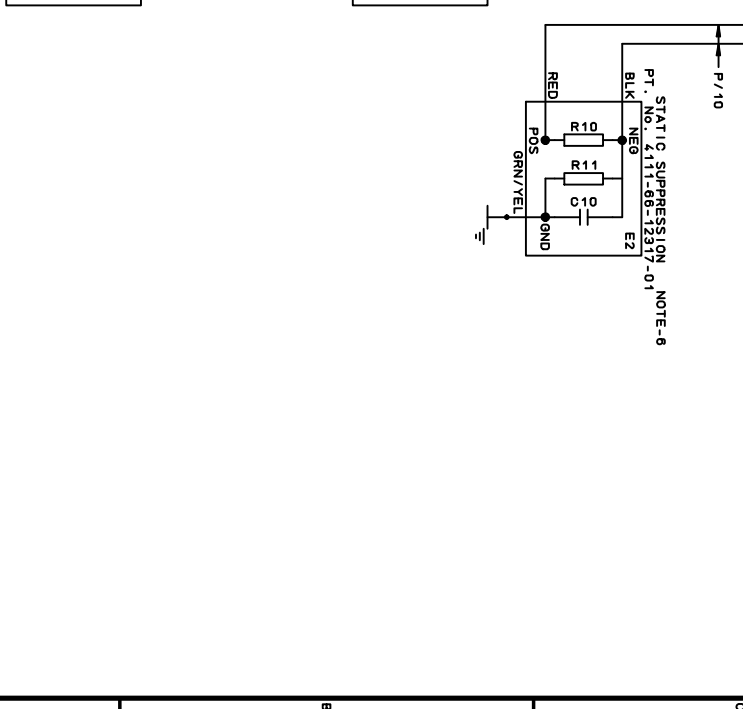
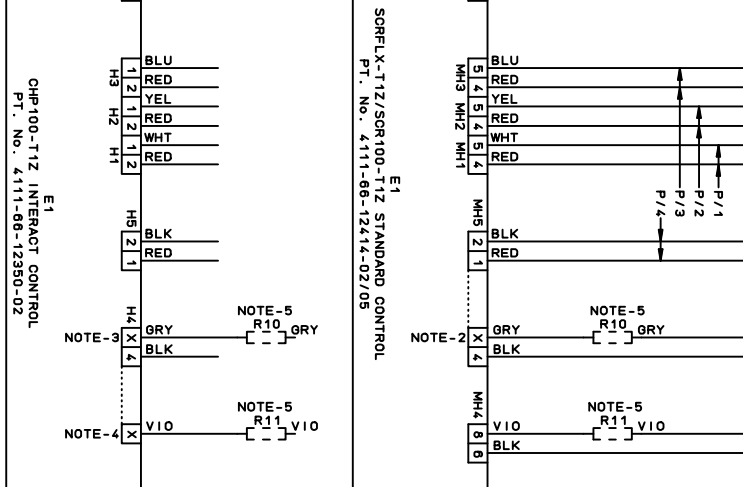
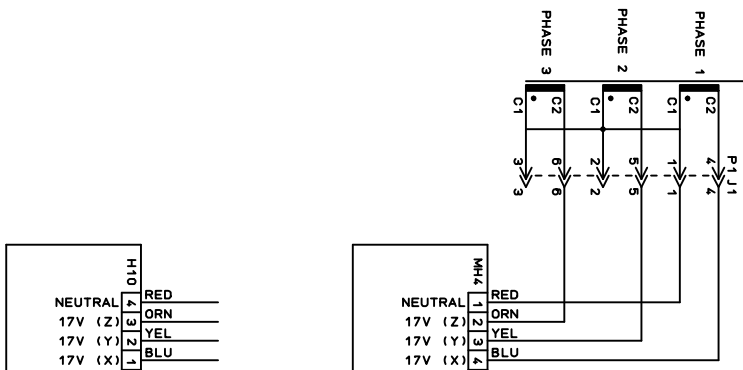
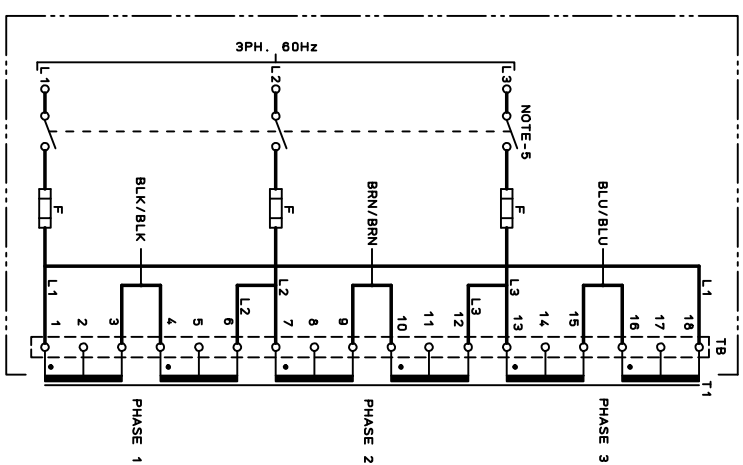
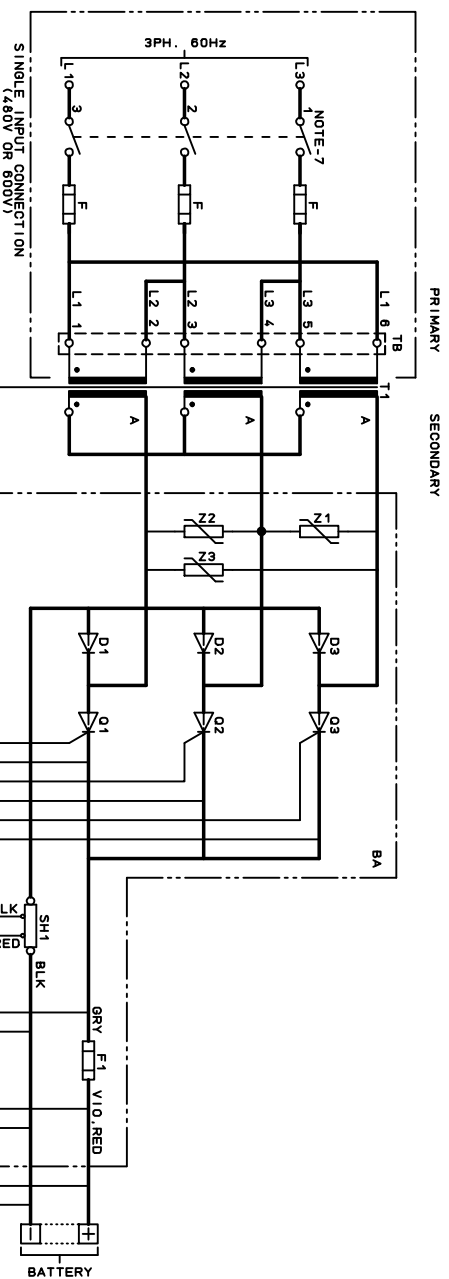
DWG No 4770-65-7304.1-10 SHEET

TOL
 SCALE
 DATE 1999-07-12
 APPR BY
 CHKD BY

CUSTOMER ORDER No.
 MANUF. ORDER No.
 JOB No.

INPUT
 OUTPUT
 CUSTOMER

DATE 12-13-2001
 DESIGNED AS PER
 ECA 01-478

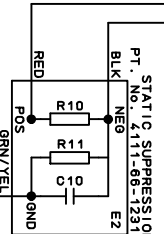


- NOTES**
1. CONSULT INSTRUCTION MANUAL FOR CHANGING THE INPUT VOLTAGE ON MULTIPLE INPUT CHARGERS.
 2. FOR SORFLX/SCR100 CHARGERS:

No. OF CELLS	CONNECTIONS
6	MH5-5
9	MH5-6
12	MH5-7
16	MH5-8
24	MH5-9
36	MH5-10
 3. FOR CHP100 CHARGERS:

No. OF CELLS	CONNECTIONS (+ VE)
6	H4-5
9	H4-6
12	H4-7
16	H4-8
24	H4-9
36	H4-10
 4. FOR CHP100 CHARGERS:

No. OF CELLS	CONNECTIONS (+ BATT)
6	H4-3
9	H4-3
12	H4-2
16	H4-2
24	H4-1
36	H4-1
 5. EXTERNAL RESISTORS R10 & R11 ARE REQUIRED FOR NON-STD. NUMBER OF CELLS BATTERY CHARGERS.
 6. STATIC SUPPRESSION ASSY. (PT. No. 4120-66-31377-40) REQUIRED FOR CHP100 CHARGERS ONLY.
 7. FOR THE FUSED AO SAFETY DISCONNECT SWITCH:
 - ON POSITION: MAIN LINE CONNECTED, DOOR CLOSED
 - OFF POSITION: MAIN LINE DISCONNECTED, DOOR OPEN.



REV 1	DATE 2001-07-26	INPUT OUTPUT CUSTOMER CUSTOMER ORDER NO. MANUF. ORDER NO. JOB NO.	SORFLX-T1Z/SCR100-T1Z/CHP100-T1Z BATTERY CHARGER THREE PHASE INPUT (CHARGERS WITH SPEC. V46-893XX-XX-JIC OPTION) SCALE DWG No. 4770-65-73041-21 SHEET
REV 2	DATE 2001-12-13		
REV 1	DATE 2001-07-26	INPUT OUTPUT CUSTOMER CUSTOMER ORDER NO. MANUF. ORDER NO. JOB NO.	SORFLX-T1Z/SCR100-T1Z/CHP100-T1Z BATTERY CHARGER THREE PHASE INPUT (CHARGERS WITH SPEC. V46-893XX-XX-JIC OPTION) SCALE DWG No. 4770-65-73041-21 SHEET
REV 2	DATE 2001-12-13		

NOTE-1
MULTIPLE INPUT CONNECTION
(208/240/480V-480V SHOWN)

NOTE-3
CHP100-T1Z INTERACT CONTROL
PT. No. 4111-66-12350-02

NOTE-4
E1

NOTE-5
R10

NOTE-5
R11

NOTE-5
V10

NOTE-5
R10

NOTE-5
R11

NOTE-5
V10

NOTE-5
R10

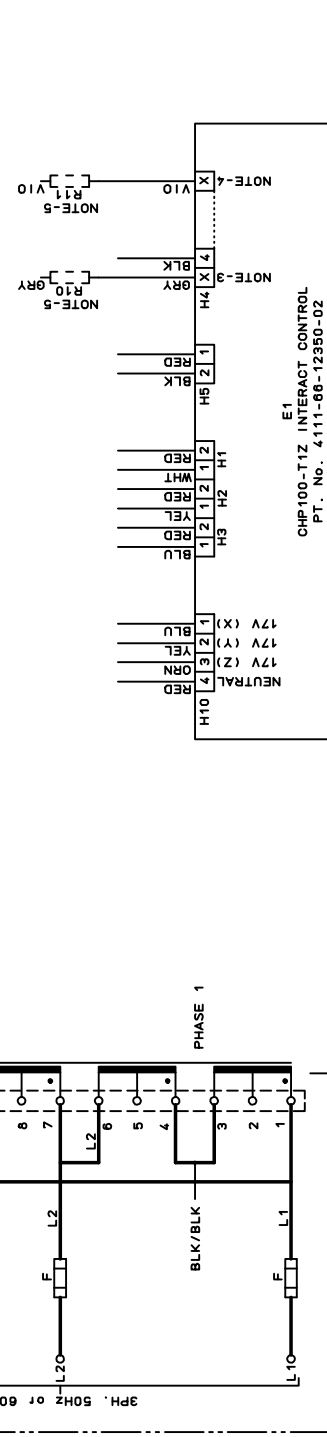
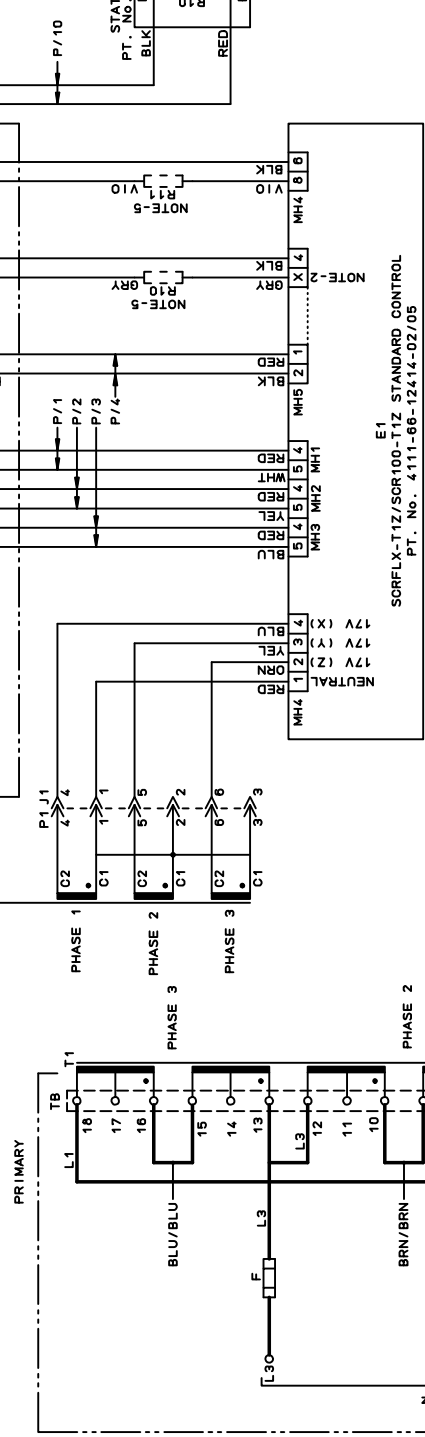
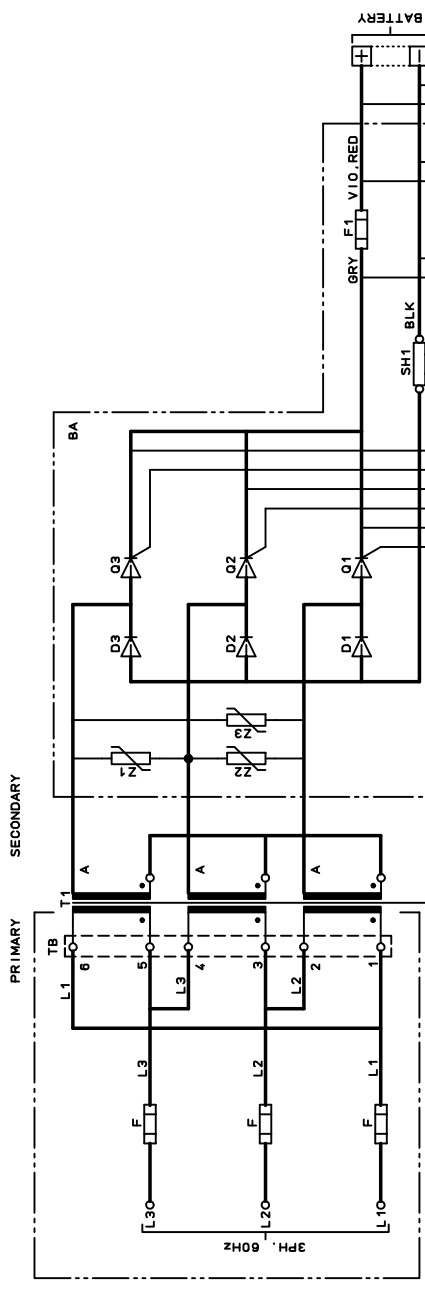
NOTE-5
R11

- NOTES**
- CONSULT INSTRUCTION MANUAL FOR CHANGING THE INPUT VOLTAGE ON MULTIPLE INPUT CHARGERS.
 - FOR SCRFLX/SCR100 CHARGERS.

CONNECTIONS	
MH5-5	6
MH5-6	9
MH5-7	12
MH5-8	18
MH5-9	24
MH5-10	36
 - FOR CHP100 CHARGERS:

CONNECTIONS (+ VE)	
H4-5	6
H4-6	9
H4-7	12
H4-8	18
H4-9	24
H4-10	36
 - FOR CHP100 CHARGERS:

CONNECTIONS (+ BATT)	
H4-3	6
H4-3	9
H4-2	12
H4-2	18
H4-1	24
H4-1	36
 - EXTERNAL RESISTORS R10 & R11 ARE REQUIRED FOR NON-STD. NUMBER OF CELLS BATTERY CHARGERS.
 - STATIC SUPPRESSION ASSY. (PT. No. 4120-66-31377-40) REQUIRED FOR CHP100 CHARGERS ONLY.



REVISIONS

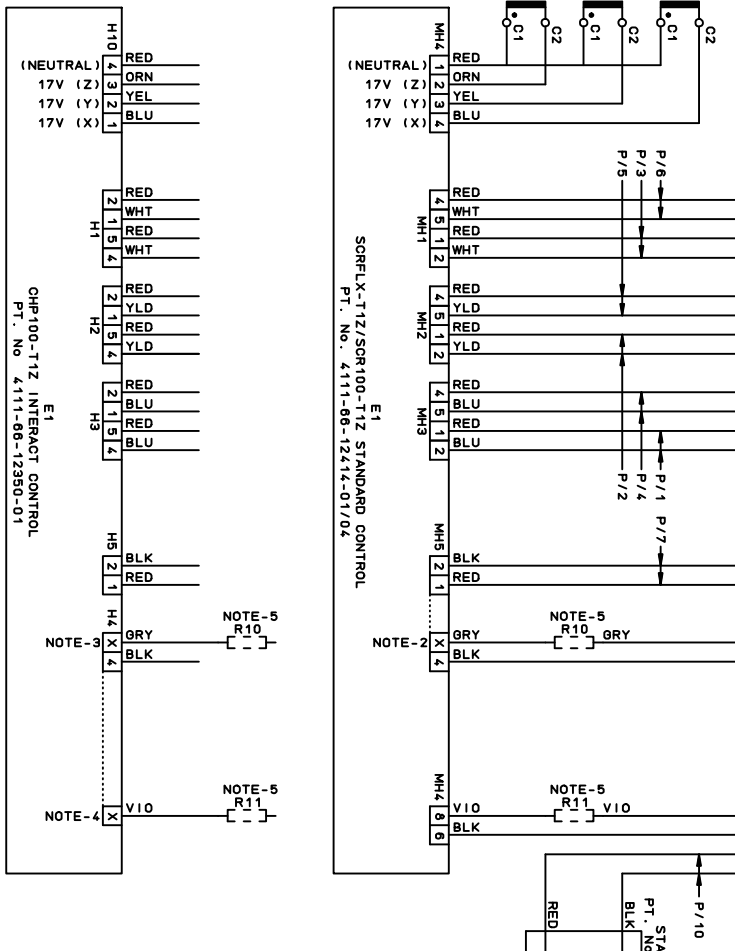
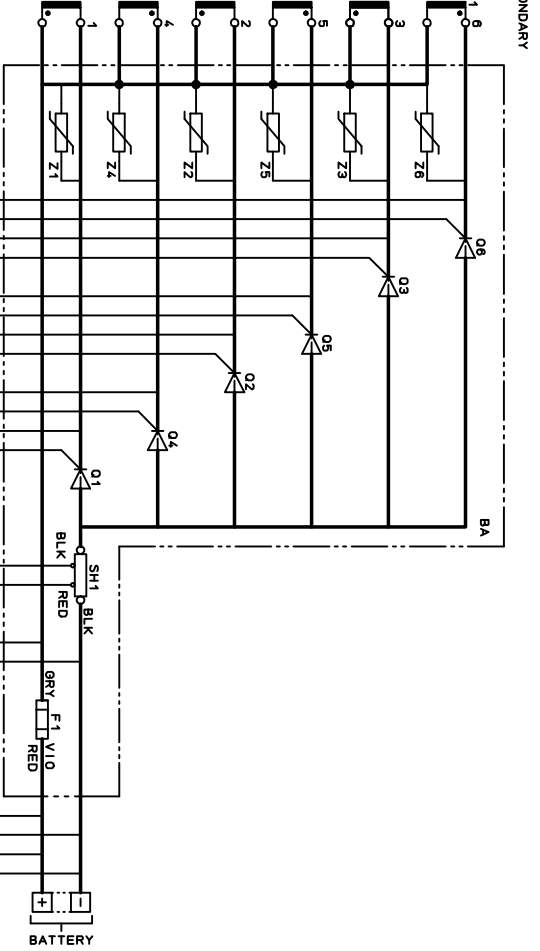
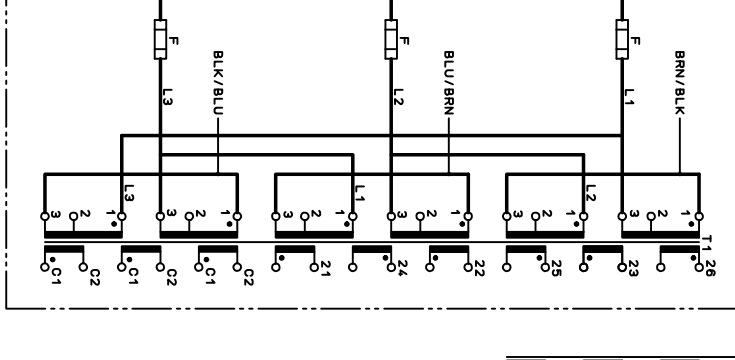
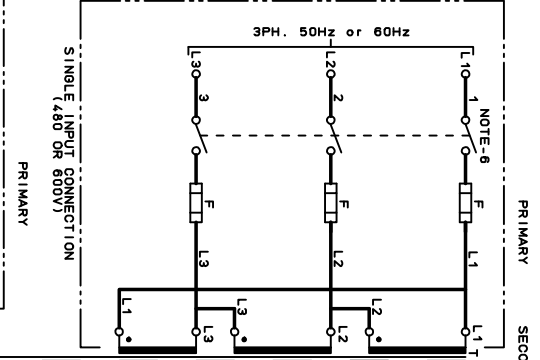
REV	DATE	REASON	BY
1	2001-07-26	AS PER	FA 01-263
2			
3			

SCHEMATIC

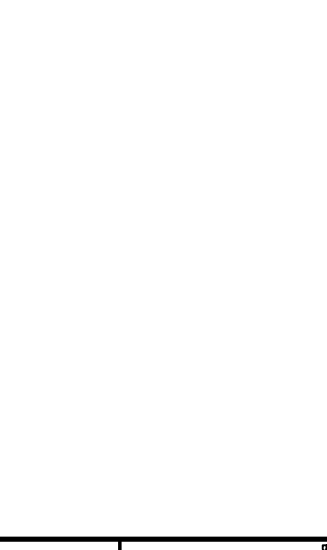
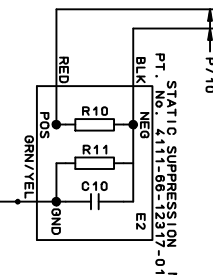
SCRFLX-T1Z/SCR100-T1Z/CHP100-T1Z BATTERY CHARGER THREE PHASE INPUT (CHARGERS WITH SPEC. V16-893XX-XX)

TOL	DWN BY	CHKD BY
SCALE	DATE 1999-07-12	APPR BY
4770-65-7304.1-20		JJ

DWG No. 4770-65-7304.1-20 SHEET 1 REV 1



- NOTES
- CONSULT INSTRUCTION MANUAL FOR CHANGING THE INPUT VOLTAGE ON MULTIPLE INPUT CHARGERS.
 - FOR SCRFLX/SCR100 CHARGERS:
 - No. OF CELLS CONNECTIONS
 - MHS-5 6
 - MHS-6 9
 - MHS-7 12
 - MHS-8 16
 - MHS-9 24
 - MHS-10 36
 - FOR CHP100 CHARGERS:
 - No. OF CELLS CONNECTIONS (+ VE)
 - H4-5 6
 - H4-6 9
 - H4-7 12
 - H4-8 16
 - H4-9 24
 - H4-10 36
 - FOR CHP100 CHARGERS, CONNECTIONS (+ BATT)
 - H4-3 6
 - H4-4 9
 - H4-2 12
 - H4-1 16
 - H4-1 24
 - H4-1 36
 - EXTERNAL RESISTORS R10 AND R11 ARE REQUIRED FOR NON-STD. NUMBER OF CELLS BATTERY CHARGERS.
 - FOR THE FUSED AC SAFETY DISCONNECT SWITCH:
 - 'ON' POSITION: MAIN LINE DISCONNECTED, DOOR CLOSED.
 - 'OFF' POSITION: MAIN LINE DISCONNECTED, DOOR OPEN.
 - STATIC SUPPRESSION ASSY. (PT. No. 4120-66-31377-40) REQUIRED FOR CHP100 CHARGERS ONLY



REV 1 DATE 2001-07-26
 REVISION AS PER ECA 01-263
 d.c.g.

NOTE-1
 MULTIPLE INPUT CONNECTION
 (208/240/480V-480V SHOWN)

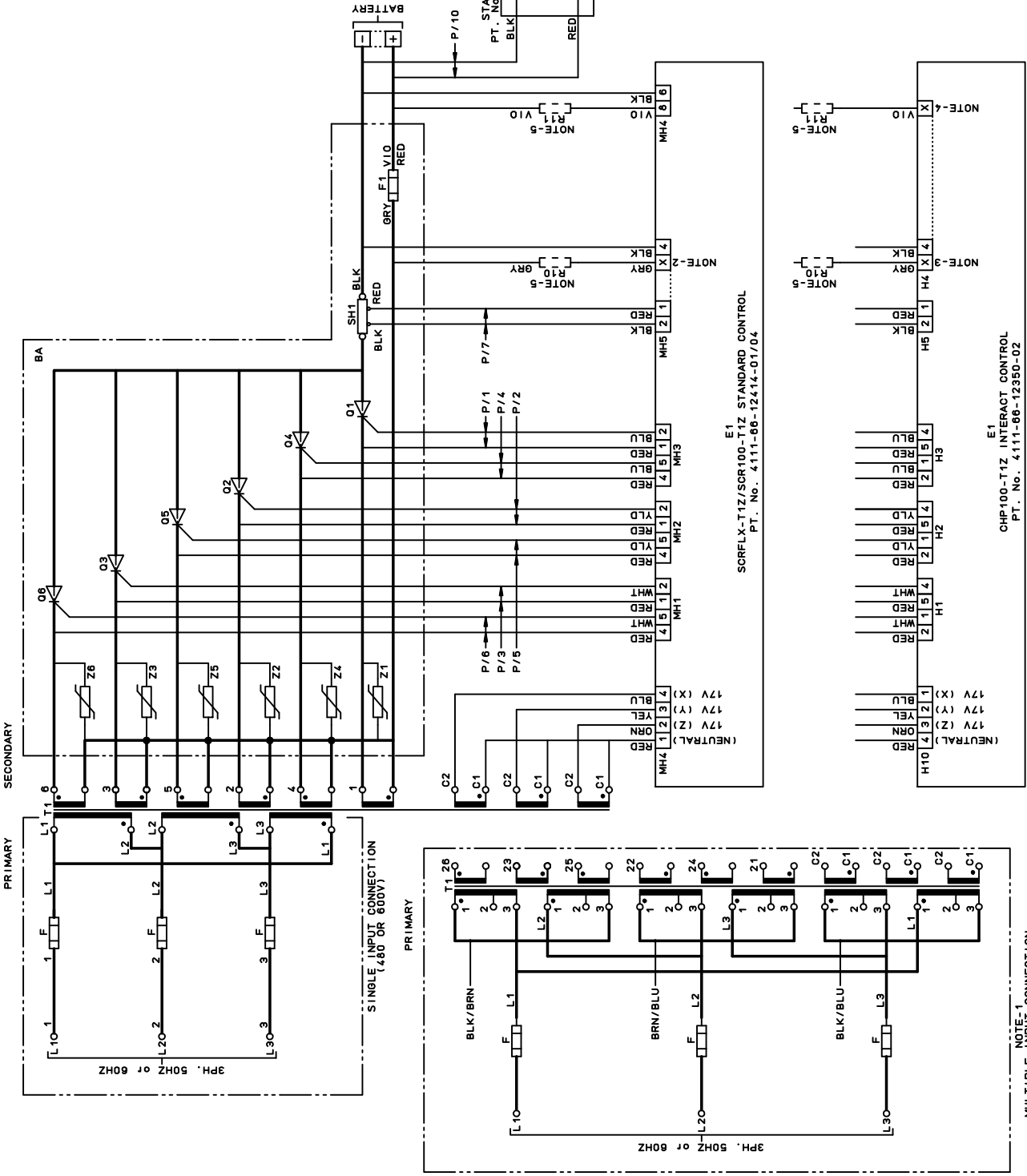
REV 2 DATE 2001-12-13
 REVISION AS PER ECA 01-448
 d.c.g.

NOTE-1
 MULTIPLE INPUT CONNECTION
 (208/240/480V-480V SHOWN)

INPUT
 OUTPUT
 CUSTOMER ORDER NO.
 MANUF. ORDER NO.
 JOB NO.

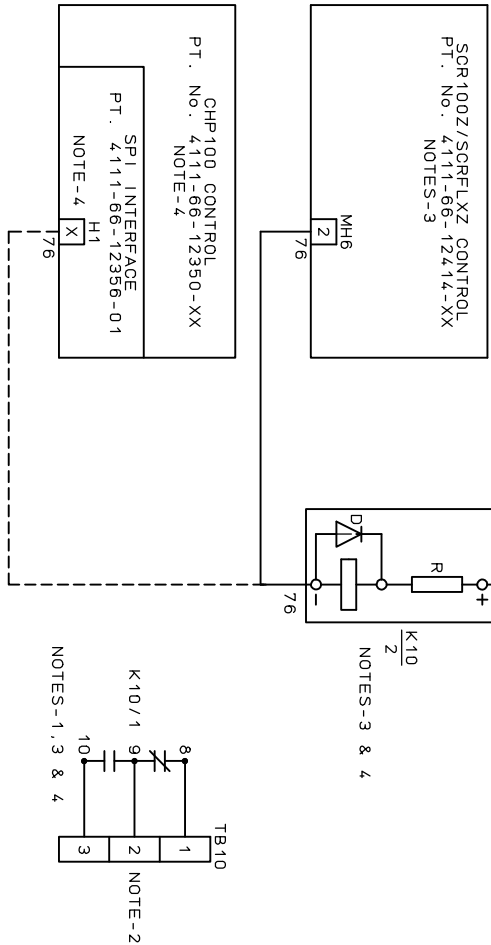
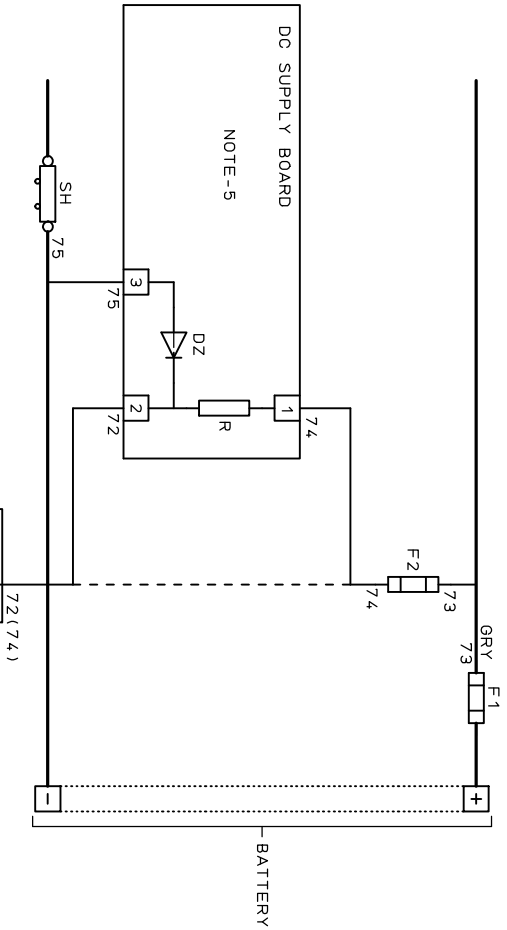
SCHEMATIC
 SCRFLX-T1Z/SCR100-T1Z/CHP100-T1Z
 BATTERY CHARGER THREE PHASE INPUT
 FOR 1450AH & GREATER (JIC VERSION)
 TO: SCALE DATE 1999-07-12 APPR BY: J.S.S.
 DWG No. 4770-65-73041-13 SHEET REV 2

- CONSULT INSTRUCTION MANUAL FOR CHANGING THE INPUT VOLTAGE ON MULTIPLE INPUT CHARGERS.
- FOR SCRFLEX/SCR100 CHARGERS:
 - CONNECTIONS
 - MH5-5 6
 - MH5-6 9
 - MH5-7 12
 - MH5-8 16
 - MH5-9 24
 - MH5-10 36
- FOR CHP100 CHARGERS:
 - CONNECTIONS (+ VE)
 - H4-5 6
 - H4-6 9
 - H4-7 12
 - H4-8 16
 - H4-9 24
 - H4-10 36
- FOR CHP100 CHARGERS:
 - CONNECTIONS (+ BATT)
 - H4-3 6
 - H4-2 9
 - H4-1 12
 - H4-10 16
 - H4-9 24
 - H4-8 36
- EXTERNAL RESISTORS R10 AND R11 ARE REQUIRED FOR NON-STD. NUMBER OF CELLS BATTERY CHARGERS.
- STATIC SUPPRESSION ASSY. (PT. No. 4120-66-31377-40) REQUIRED FOR CHP100 CHARGERS ONLY.



REV 1	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 2	DATE 2001-12-13	REVISED AS PER	FOA 01-478
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REV 14	DATE 2001-12-13	REVISED AS PER	FOA 01-478
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REV 16	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 17	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 18	DATE 2001-12-13	REVISED AS PER	FOA 01-478
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REV 21	DATE 2001-12-13	REVISED AS PER	FOA 01-478
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REV 23	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 24	DATE 2001-12-13	REVISED AS PER	FOA 01-478
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REV 26	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 27	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 28	DATE 2001-12-13	REVISED AS PER	FOA 01-478
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REV 33	DATE 2001-12-13	REVISED AS PER	FOA 01-478
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REV 36	DATE 2001-12-13	REVISED AS PER	FOA 01-478
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REV 1	DATE 2001-12-13	REVISED AS PER	FOA 01-478
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REV 8	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 9	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 10	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 11	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 12	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 13	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 14	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 15	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 16	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 17	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 18	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 19	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 20	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 21	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 22	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 23	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 24	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 25	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 26	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 27	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 28	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 29	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 30	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 31	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 32	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 33	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 34	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 35	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 36	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 37	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 38	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 39	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 40	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 41	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 42	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 43	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 44	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 45	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 46	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 47	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 48	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 49	DATE 2001-12-13	REVISED AS PER	FOA 01-478
REV 50	DATE 2001-12-13	REVISED AS PER	FOA 01-478



NOTES

1. RELAY CONTACTS SHOWN IN DE-ENERGIZED STATE.
RATINGS:
125VAC 0.6A 60VA 1.0PF MAX.
30VDC 2A 60W RESISTIVE MAX.
2. MAXIMUM REMOTE WIRING SIZE: #16AWG.
3. FOR THE SCR100Z/SCRFLXZ CONTROL (WATERING OPTION), THE RELAY WILL ENERGIZE 30 MINUTES AFTER THE CHARGER REACHES GASSING VOLTAGE, IT REMAINS ENERGIZED FOR 10 MINUTES.
4. FOR CHP100 CONTROL ONLY:
 - a. FOR REMOTE FAULT, CONNECT TO H1-22 (IF SOLD WITH REMOTE CONTROL PANEL) OR H1-4 (IF SOLD ALONE). THE RELAY IS ENERGIZED DURING NORMAL CHARGING, BUT DE-ENERGIZES WHEN A FAULT CONDITION APPEARS.
 - b. FOR WATERING, CONNECT TO H1-22. THE RELAY WILL ENERGIZE 30 MINUTES AFTER THE CHARGER REACHES GASSING VOLTAGE. IT REMAINS ENERGIZED FOR 10 MINUTES.
 - c. THE SPI INTERFACE BOARD IS REQUIRED FOR OPTIONS a. & b.
5. DC SUPPLY BOARD IS ONLY REQUIRED FOR 18-36 CELL CHARGERS.

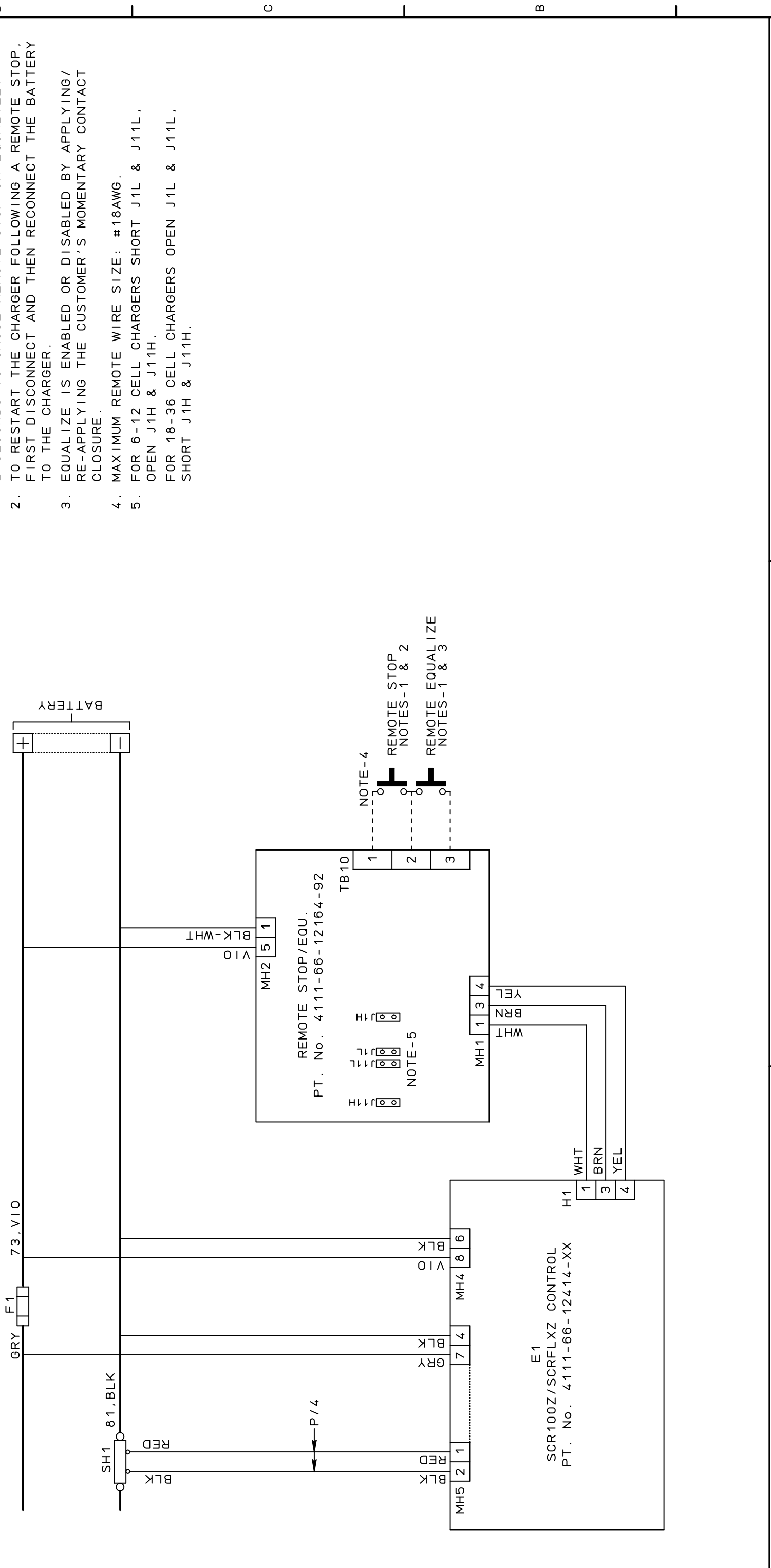
REV 1	DATE 1994-03-04
REVISED AS PER ECN 1994-37	
d.c.g. REL PH	
REV 2	DATE 1995-02-09
REVISED AS PER ECN 1995-030	
d.c.g. REL DE	
REV 3	DATE 1995-03-02
REVISED AS PER ECN 1995-048	
d.c.g. REL DE	
REV 4	DATE 1996-04-08
REVISED AS PER ECN 1996-095	
r.e.l. DE REL	
REV 5	DATE 1996-09-26
REVISED AS PER ECN 1996-254	
r.e.l. DE REL	
REV 6	DATE 1996-10-24
REVISED AS PER ECN 1996-276	
d.c.g. BL FG	
REV 7	DATE 1997-07-03
REVISED AS PER ECN 1997-160	
d.c.g. BL FG	
REV 8	DATE 1999-06-01
REVISED AS PER ECN 1999-084	
d.c.g. EK GGP	
REV 9	DATE 2000-03-10
REVISED AS PER ECA 2000-111	
d.c.g.	

SCHEMATIC - BATTERY WATERING OPERATION, REMOTE FAULT OPTIONS FOR SCR100Z/SCRFLXZ/CHP100 PART No. 4120-66-31377-XX			
TOL	DWN BY <i>d.c.g./jha</i>	CHKD BY <i>REL</i>	
SCALE	DATE 1994-02-02	APPR BY <i>PH</i>	
DWG No 4120-65-68650-00	SHEET	REV 9	

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NOTES

1. THE CUSTOMER'S CONTACTS FOR BOTH THE REMOTE EQUALIZE AND THE REMOTE STOP SHOULD BE VOLTAGE-FREE AND RATED FOR 110VDC @ 0.1A. THE CUSTOMER'S CONTACTS MUST CLOSE FOR 2 SECONDS TO CAUSE REMOTE STOP OR EQUALIZE.
2. TO RESTART THE CHARGER FOLLOWING A REMOTE STOP, FIRST DISCONNECT AND THEN RECONNECT THE BATTERY TO THE CHARGER.
3. EQUALIZE IS ENABLED OR DISABLED BY APPLYING/RE-APPLYING THE CUSTOMER'S MOMENTARY CONTACT CLOSURE.
4. MAXIMUM REMOTE WIRE SIZE: #18AWG.
5. FOR 6-12 CELL CHARGERS SHORT J1L & J11L, OPEN J1H & J11H. FOR 18-36 CELL CHARGERS OPEN J1L & J11L, SHORT J1H & J11H.



SCHEMATIC		REMOTE STOP/REMOTE EQUALIZE OPTION FOR	
INPUT		SCR100Z/SCRFLXZ BATTERY CHARGER	
OUTPUT		PT. No. 4120-66-31365-50	
CUSTOMER		TOL	CHKD BY
CUSTOMER ORDER No.		SCALE	APPR BY
MANUF. ORDER No.		DATE 2002-08-09	
JOB No.		4120-65-68650-50	
DWG No		SHEET	
REV		REV	



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**GNB Industrial Power
Motive Power**
829 Parkview Boulevard
Lombard, IL 60148-3249
U.S.A.
Tel: 877.GNB.INFO
Fax: 630.691.7869

**GNB Industrial Power
Motive Power**
8301 Keele Street
Maple, Ontario
Canada L6A 1T2
Tel: 905.669.9326
Fax: 905.669.7688

**Exide Technologies
Chloride Motive Power**
P.O. Box 1, Salford Road
Over Hulton, Bolton BL5 1DD
United Kingdom
Tel: 44.1204.661.230
Fax: 44.1204.652.100



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