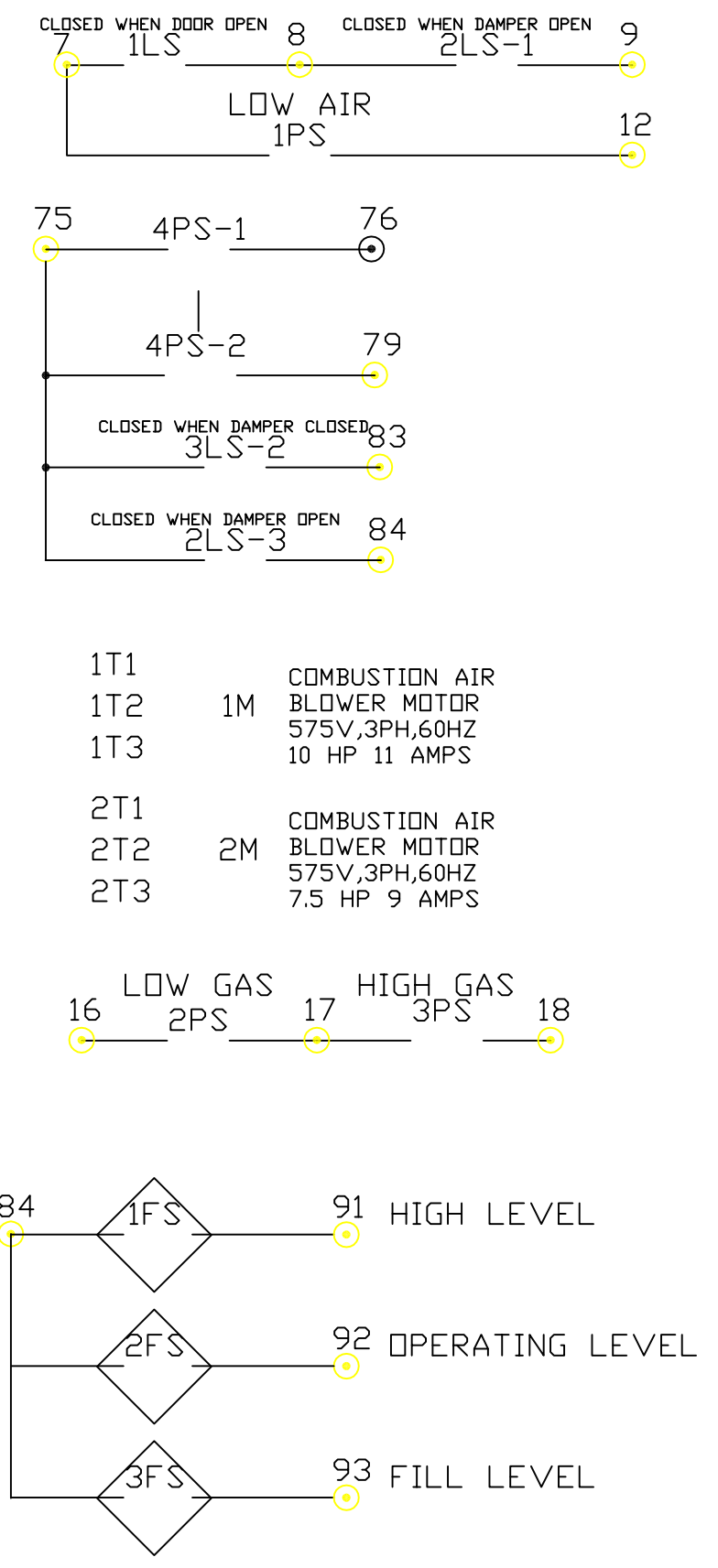
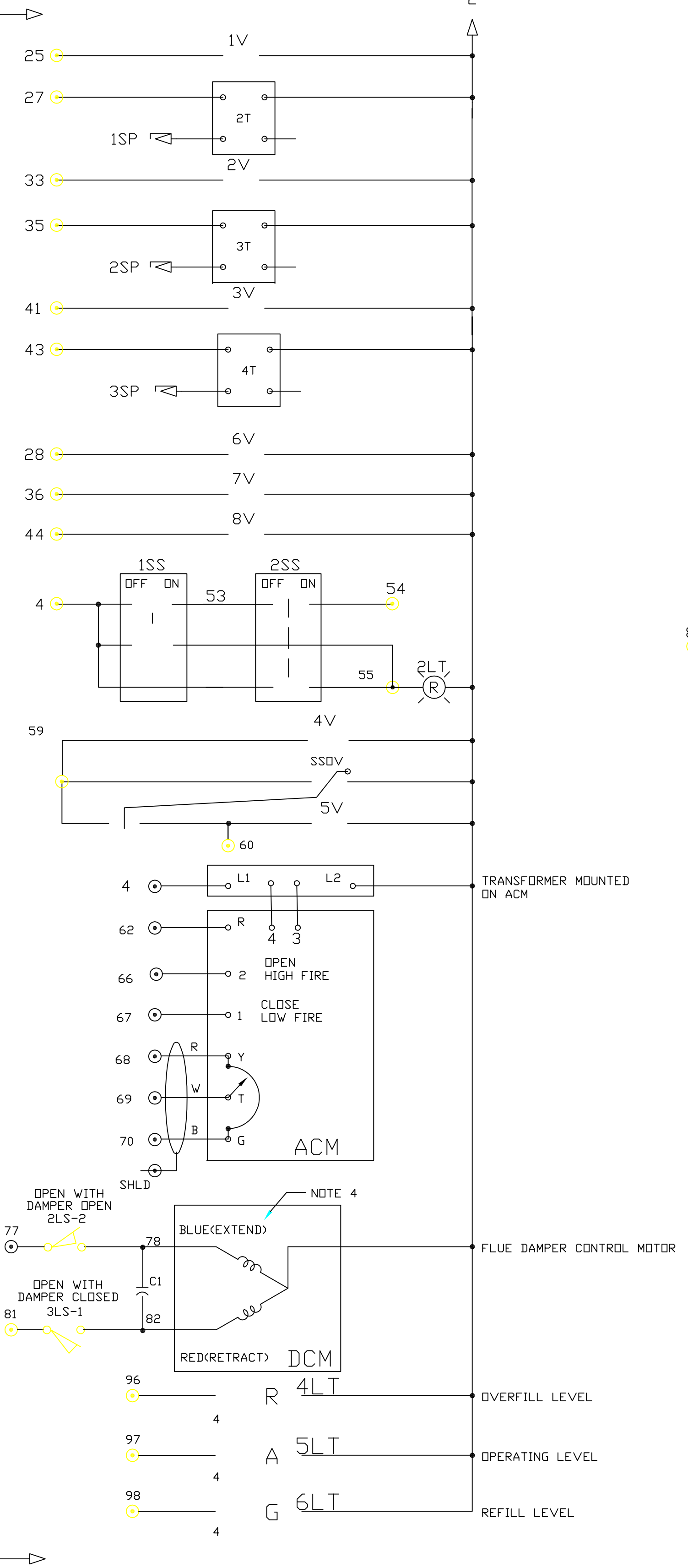


PANEL CONNECTIONS



NOTE: ALL CONNECTIONS TO BE MADE AT THE MAIN PANEL'S TERMINAL STRIP.

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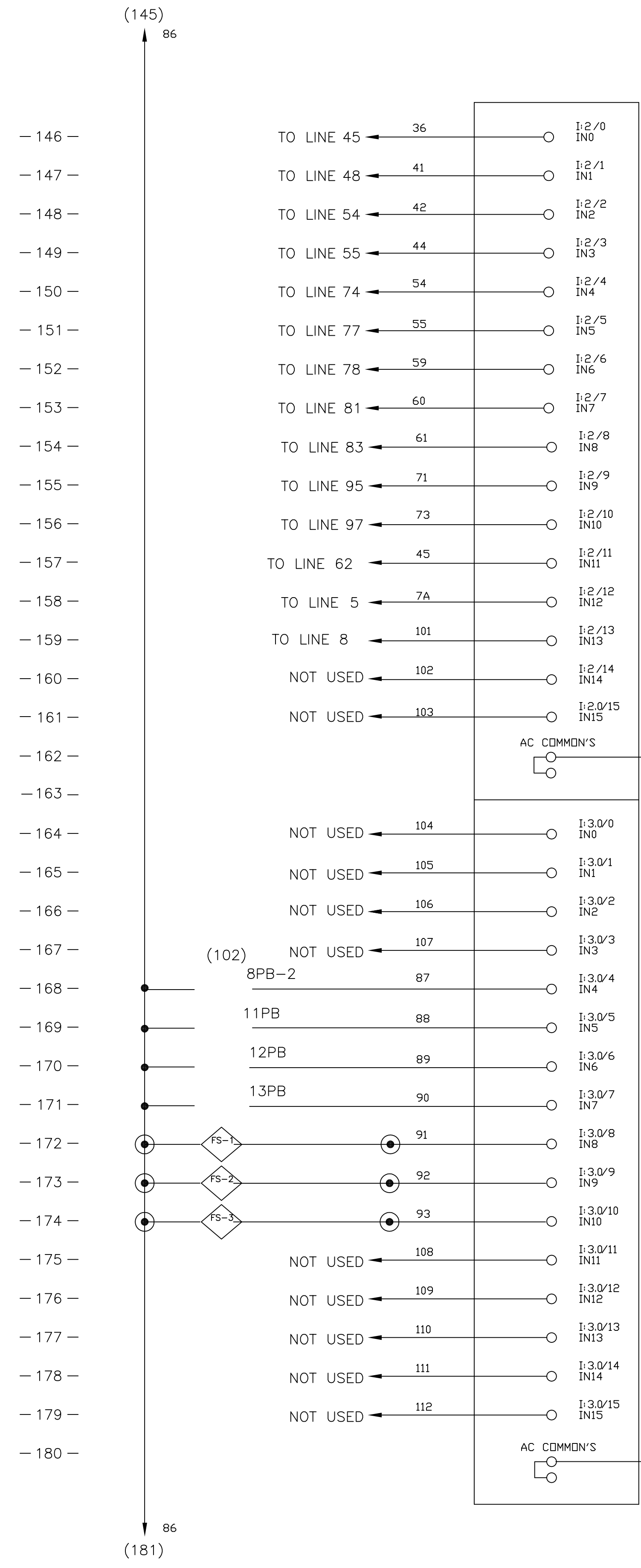
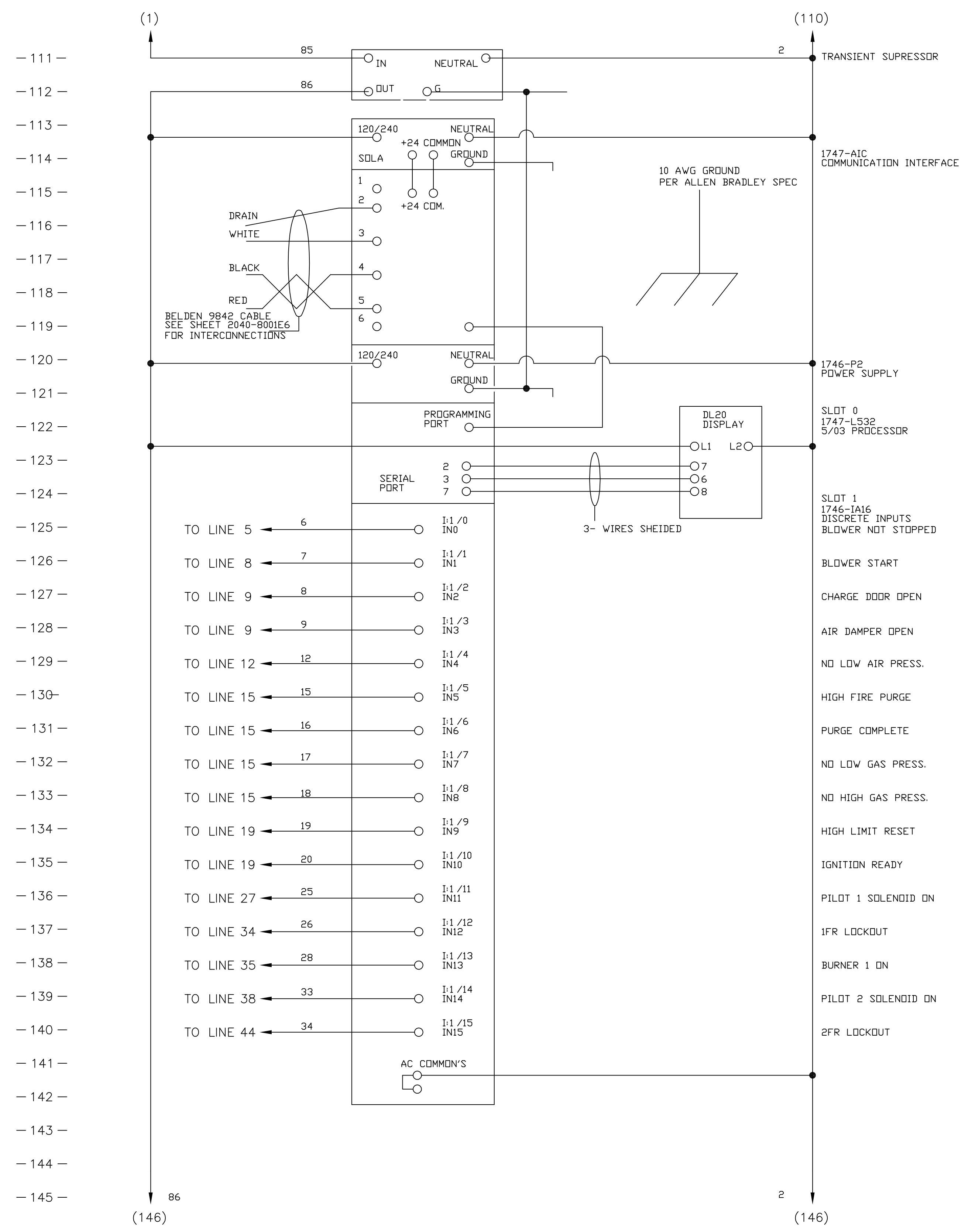
**LINDBERG/MPH**

P.O. BOX 131  
RIVERSIDE,  
MICHIGAN 49084  
1-616-849-2700 PHONE  
1-616-849-3021 FAX

TYPE 62-ARP3500		
PART ELECTRICAL SCHEMATIC		
REVISION DESCRIPTION	DATE	SYM
DATE REL'D TO BUILD	DATE	CHKD
FORMER DWG No.	DATE	DWG. NO.

DATE 5-7-97  
DRAWN BY PMY  
CHKD DK  
DWG. NO. 2040-3502E2

PATH=D:\620E\403502E2



STATION C PATH=C:\620E\403502E3

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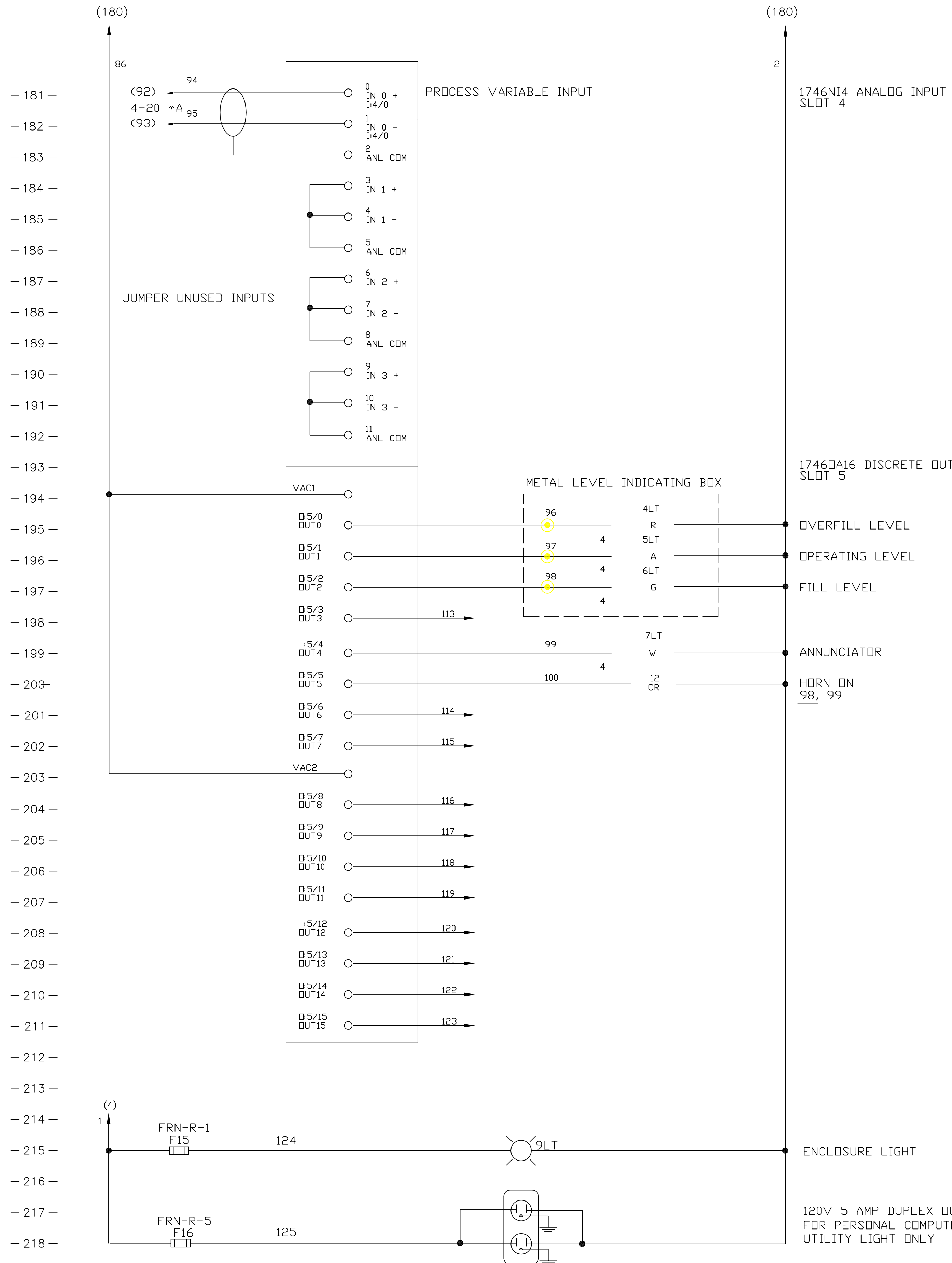
**LINDBERG/MPH**

P.O. BOX 131 RIVERSIDE, MICHIGAN 49084

1-616-849-2700 PHONE 1-616-849-3021 FAX

TYPE	62-ARP3500		
PART	SLC500 CONNECTIONS & ADDRESS ASSIGNMENT		
DATE	5-7-97	DRAWN BY	PMY
DATE REL'D TO BUILD		CHKD	DK
REVISION DESCRIPTION	DATE	SYM	CUSTOMER
FORMER DWG No.			DWG. NO. 2040-3502E3





○ INDICATES WIRE RUN FROM DOOR TO PANEL.  
 ○ INDICATES EXTERNAL CONNECTION ON FURNACE

**\*\*\* NOTES \*\*\***

- IF AN EXHAUST HOOD BLOWER INTERLOCK IS DESIRED, REMOVE THE JUMPER AND CONNECT TERMINALS 4 & 5 TO THE NO. AUXILIARY CONTACT ON THE HOOD BLOWER STARTER.
- ALL T/C WIRES MUST BE RUN IN A SEPARATE CONDUIT FROM POWER OR CONTROL WIRING. RUN DIRECT FROM THE THERMOCOUPLE TO THE TEMPERATURE CONTROLLER IF POSSIBLE. ON CA TYPE K T/C WIRE RED IS ALWAYS NEGATIVE. IT WILL ALSO ATTRACT A MAGNET.
- INSTALL UV SCANNERS WITH INSTRUCTIONS PROVIDED BELOW.
- TO CHANGE THE DIRECTION OF THE ACTUATOR ACTION INTERCHANGE THE BLUE AND RED WIRES.

**WIRING OF UV SCANNERS**

THE UV-1A SCANNER IS SUPPLIED WITH 36" OR 72" OF FLEXIBLE CABLE. THE UV-2 SCANNER IS SUPPLIED WITH 36" OF FLEXIBLE CABLE. IF IT IS NECESSARY TO EXTEND THE SCANNER LEADS, THE FOLLOWING INSTRUCTIONS APPLY.

- SELECTION OF WIRE
  - USE # 16 OR 18 AWG SRML WIRE WITH 150C, 600 VOLT INSULATION FOR UP TO A 200 FOOT DISTANCE. @ 200' 40% SIGNAL LOSS WILL OCCUR IF UNSATISFACTORY SEE b
  - USE SHIELDED WIRE (BELDEN 8254-RG-62 COAX CABLE OR EQUAL) FOR EACH SCANNER WIRE UP TO 500 FEET (MAX).
  - ASBESTOS INSULATED WIRE SHOULD BE AVOIDED.
  - MULTICONDUCTOR CABLE IS NO TO BE USED FOR UV SCANNER WIRING.
  - SCANNER LEADS MUST BE INSTALLED IN A CONDUIT SEPARATE FROM POWER & CONTROL WIRING CONDUIT.
  - THE WIRING FROM UV SCANNERS MAY BE RUN IN THE SAME CONDUIT WITH T/C WIRES. SIZE THE CONDUIT APPROPRIATELY.
  - HIGH VOLTAGE IGNITION WIRES SHOULD NOT BE INSTALLED IN THE SAME CONDUIT WITH FLAME DETECTOR WIRES.

**Sequence of Operation  
 AR-3500 Melting Furnace**

- Switch the flange mounted disconnect to the 'DN' position. Power will be supplied to the line side of the contacts of the Combustion Air Motor Starter (1M) and the Air Curtain Blower Motor Starter (2M). The primary and secondary windings of the control transformer (1T) will energize and power the Metal Temperature Controller (1CD), the High Limit (1HL) temperature controller and the chamber controller (2CD). The enclosure A/C will energize.
- The alarm horn will sound through the normally closed contact 8CR-3. Press the Alarm Silence pushbutton (8PB). The Alarm Silence relay (11CR) will energize, closing 11CR-1 to latch and 11CR-2 to de-energize the alarm horn.
- Press the Combustion Air Blower Start pushbutton (2PB). 1M will energize and latch through 1M-4, 1M-1 through 1M-3 will close, energizing the Combustion Air Blower motor. 2PBTLT will energize indicating the blower is energized.
- The air pressure in the air header will increase and close the Low Air pressure switch (1PS). Power will then be supplied to the High Fire Purge Control Relay (1CR) and the clutch of the Purge Timer (1PT). 1CR-1 & 1CR-2 will switch state, causing the Air Control Motor (ACM) to go to the high fire position for the purge. The flue damper air pressure switch will actuate, switching contacts 4PS1 & 2 causing the flue damper to open. The Flue Damper Open limit switch (2LS) will actuate when the damper is fully open, closing 2LS-1.
- Open the charge door. 1LS will close when the charge door is fully open. Power will be supplied through closed 2LS-1 to the motor of 1PT to start the timing of the purge. The blue Purging segment of 1LT will energize.
- 1PT will time out and de-energize 1CR, causing ACM to return to the low fire position. 1PT contacts 6 & 5 will close energizing the green Purge complete segment of 1LT. Power will be supplied to terminal 6 of 1HL through contacts of 2PS & 3PS. If 1HL has been reset, power will be supplied to contact ACM-1 from terminal 7 of 1HL. If 1HL has not been reset, reset it by pressing the reset pushbutton on the front of the controller.
- When ACM has returned to the low fire position the amber Ignition Ready segment of 1LT will energize and indicate that the pilots may be ignited. 2CR-1 & 2 will open. 2CR-1 & 2 will open de-energizing the Purging and Purge Complete segments of 1LT. 2CR-3 will close and latch the coil of 2CR. 2CR-4 through 2CR-6 will close and energize the chassis of Flame Relays 1 through 3 (1FR-3FR).
- Press the burner number one Pilot Ignition pushbutton (5PB) and hold it in until SPBLT energizes. The pilot solenoid valve (1V) and the Ignition Transformer (2T) will energize and ignite the pilot during a 10 second trial for ignition. When the ultraviolet scanner detects a flame power will be applied to terminal 5 of 1FR, energizing 3CR and 5PBTLT. 3CR-1 will latch the flame relay 'DN', 3CR-2 will close. If there is no pilot during the 10 second trial for ignition a heater will trip in the flame relay. The red reset pushbutton will need to be pressed to reset the flame relay before another ignition trial can be performed.
- Repeat step 9 for burners 2 through 3.
- 3CR-2, 4CR-2, 5CR-2 will be closed and supply power to the coil of the Safety Shutoff Valve (SSDV), and the normally open vent valve, which will close. Open the SSDV. The valve open switch will close and energize 8CR. 8CR-1 & 2 will change state allowing 1CD to control ACM. 8CR-3 will open resetting the alarm circuitry. 8CR-TD will begin timing.
- 8CR-TD will time out and energize the Pilot Interrupt relay (9CR). Make Before Break contacts 9CR-1 & 2 will reset 1PT. 9CR-3 through 9CR-5 will open and de-energize the pilot solenoid valves and extinguish the pilot flame, this will cause the UV scanners to monitor only the main burner flames.
- The low fire switch is to be left in the 'Off' position during normal operation. It should be switched to the 'On' position before the charge door is opened. This will de-energize 7CR causing 7CR-1 through 7CR-4 to return to their relaxed state. 7CR-1 & 2 will force ACM to the low fire position. 7CR-3 & 4 will cause the flue damper to open.
- The furnace will shut down for the following reasons:
  - Flame failure
  - Low air or gas pressure
  - High gas pressure
  - High limit excess temperature
  - Pressing the combustion blower stop
- The PLC annunciator will sound the alarm horn for the above reasons. It will also advise the operator of the correct starting sequence. It is possible to scroll through the messages in the annunciator for trouble-shooting tips. PRESS THE ANNUNCIATOR RESET PUSHBUTTON AFTER SCROLLING THE MESSAGES! If this is not done, the annunciator will not check the current status of the furnace when it is operating. The annunciator light will flash during alarms and when the scrolling mode is in effect.
- The annunciator will indicate the error on start up of the furnace. If furnace shutdowns occur and no problem is annunciated check the uv scanner, low fire air and gas, and the flame relay as possible causes.

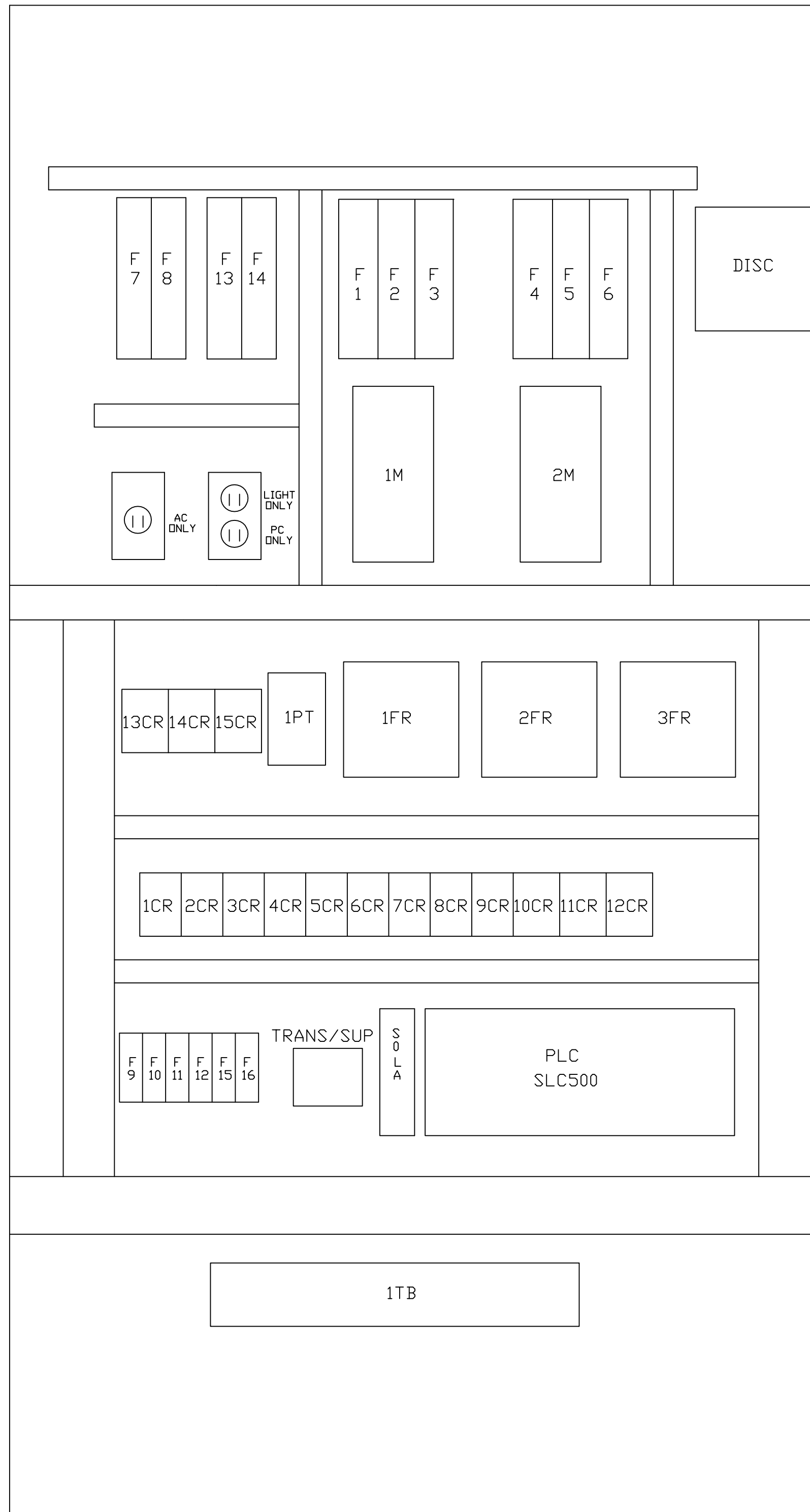
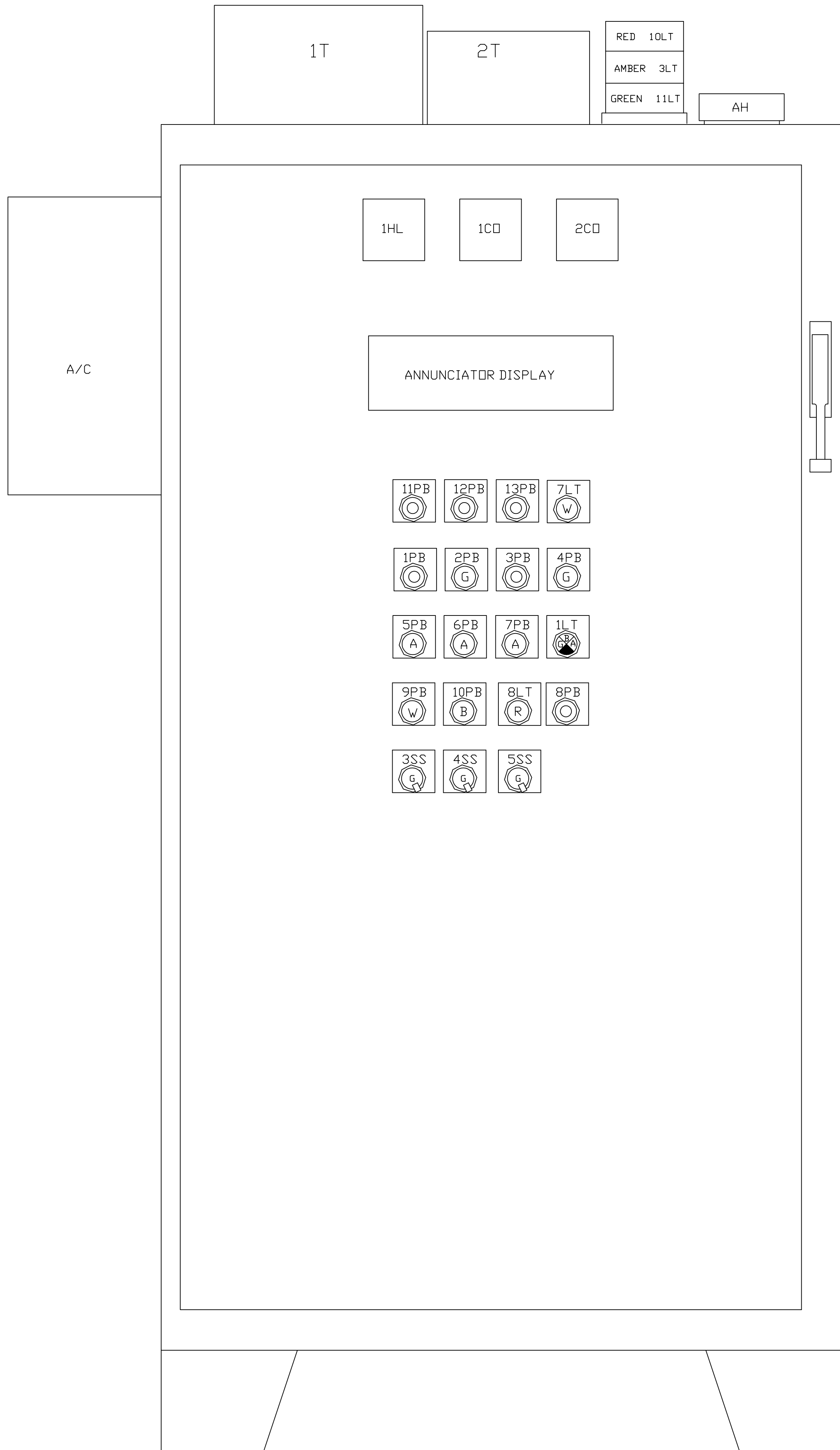
STATION C PATH=D:\620E\403502E4

**GS**  
 A GENERAL SIGNAL COMPANY

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P.O. BOX 131  
 RIVERSIDE,  
 MICHIGAN 49084  
 1-616-849-2700 PHONE  
 1-616-849-3021 FAX

TYPE	62-ARP3500		
PART	SLC500 OUTPUT & DISPLAY CONNECTIONS		
DATE	7-22-97	DRAWN BY	DK
CUSTOMER			
REVISION DESCRIPTION	DATE	SYM	
SIMILAR TO DWG No.			
FORMER DWG No.			
DATE RELEA TO BUILD		CHKD	DK
DWG. NO.	2040-3502E4		



SYMBOL	QTY	UDM	PART NO.	DESCRIPTION	MANUFACTURER
A/C	1.00	EACH	0401-0125	17-0216-G009	AIR CONDITIONER 1500/1800
ENC	1.00	EACH	0401-0123	A72-XM4018	ENCLOSURE W/CUTOUTS, KEYLOCK
1HL	1.00	EACH	0402-0045	DC-200H-0-000-1D-0000-0	CONTROLLER HIGH LIMIT
1CD	1.00	EACH	0402-0701	DC-300E-E-200-12-0A00-0	VALVE POSITIONER
2CD	1.00	EACH	0402-0037	DC-200E-0-000-1D-0000-0	CONTROLLER CHAMBER TEMP.
F4-6	3.00	EACH	0404-0201	FRS-R-12	FUSE 600V
2M	3.00	EACH	0404-0272	W52	HEATER
DISC	1.00	EACH	0403-0004	1494V-RA2	CONNECT ROD
1M_2M	2.00	EACH	0403-0009	509-BDD	STARTER
DISC	1.00	EACH	0403-0001	1494R-N1	LUG KIT
DISC	1.00	EACH	0403-0005	1494V-DS60	DISCONNECT SWITCH 60 AMP
TB	3.00	EACH	0404-0014	1492-N25	MOUNTING CHANNEL STANDOFF
1, 3, 4-6, 10-12CR	8.00	EACH	0404-0018	700-N200A1	RELAY 2-POLE 120V COIL
7, 8, 13-15CR	2.00	EACH	0404-0019	700-N400A1	RELAY 4-POLE 120V COIL
1PT	1.00	EACH	0404-0080	BR-1746	TIMER
2_9CR	2.00	EACH	0404-0092	A700-N600A1	RELAY 6-POLE 120V COIL
F9	1.00	EACH	0404-0118	FRN-R-1-6/10	FUSE 250V
F12	1.00	EACH	0404-0131	FRN-R-6	FUSE 250V
F10	1.00	EACH	0404-0134	FRN-R-7-1/2	FUSE 250V
F11	1.00	EACH	0404-0139	FRN-R-15	FUSE 250V
F7, 8	2.00	EACH	0404-0196	FRS-R-7	FUSE 600V
F1-3	3.00	EACH	0404-0202	FRS-R-15	FUSE 600V
1M	3.00	EACH	0404-0274	W54	HEATER
8CR	1.00	EACH	0404-0312	700-NT	TIMER HEAD PNEUMATIC
F1-6	2.00	EACH	0404-0402	R60030-3SR	FUSE BLOCK
F7, 8	1.00	EACH	0404-0400	R60030-2SR	FUSE BLOCK
F9-12	2.00	EACH	0404-0401	R25030-2SR	FUSE BLOCK
1-12CR	1.00	EACH	0404-0502	700-MP12	MOUNTING STRIP
9CR	1.00	PAIR	0404-0504	700-C11Z	OVERLAPPING CONTACTS
TB	0.50	EACH	1207-0001	199-DR1	TERMINAL BLOCK MOUNTING RAIL
TB	10.00	EACH	1207-0002	9080-MH26	TERMINAL BLOCK MARKER
TB	50.00	EACH	1207-0003	9080-M6/8G	TERMINAL BLOCK
TB	6.00	EACH	1207-0004	9080MFEMG	TERMINAL BLOCK END BARRIER
TB	2.00	EACH	1207-0006	9080-M6/8P	TERMINAL BLOCK, GROUNDING
TB	4.00	EACH	1207-0005	9080-MH10	TERMINAL BLOCK END CLAMP
TB	2.00	EACH	1207-0007	9080-MH72	TERMINAL BLOCK BRIDGE BAR
8LT	1.00	EACH	0405-0060	800T-N40	PB16 LENS: RED
2, 4-7PB	5.00	EACH	0405-0008	800T-PA16	LIGHTED PUSHBUTTON
1LT	1.00	EACH	0405-0030	800T-PC316BAXG	PILDT LIGHT CLUSTER
8, 11-13PB	4.00	EACH	0405-0033	800T-A2	PUSHBUTTON BLACK IND/INC
7, 8LT	2.00	EACH	0405-0043	800T-PT16	PILDT LIGHT
9, 10PB	2.00	EACH	0405-0044	800T-PB16	LIGHTED PUSHBUTTON
2, 4PBLT	2.00	EACH	0405-0046	800T-N41	PB16 LENS: GREEN
5-7PBLT	3.00	EACH	0405-0047	800T-N42	PB16 LENS: AMBER
10PBLT	1.00	EACH	0405-0048	800T-N43	PB16 LENS: BLUE
9PBLT, 7LT	2.00	EACH	0405-0049	800T-N44	PB16 LENS: WHITE/CLEAR
1, 3PB	2.00	EACH	0405-0051	800T-BG02	PUSHBUTTON RED
3LT	1.00	EACH	0405-0089	121S-120RSB	LIGHT, BEACON, 120V RED
1-3FR	3.00	EACH	0407-0004	Q270A-1024	SUBBASE
1-3FR	3.00	EACH	0407-0007	R8990G-1260	FLAME RELAY
1-3UV	3.00	EACH	0407-0005	C7027-A1023	MINI PEEPER
AH	1.00	EACH	0408-0003	874-NB	ALARM HORN GRILLE 120V
1T	1.00	EACH	0409-0043	HS10F3AS	TRANSFORMER
A/C	1.00	EACH	0418-0018	5261	RECEPTACLE, 15A SINGLE
A/C	1.00	EACH	0418-0019	43SLI-2	RECEPTACLE BOX
A/C	1.00	EACH	0418-0020	2539	RECEPTACLE COVER SINGLE
UTILITY	1.00	EACH	0418-0040	5262	DUPLEX RECEPTACLE
UTILITY	1.00	EACH	0418-0019	43SLI-2	RECEPTACLE BOX
UTILITY	1.00	EACH	0418-0042	2510	RECEPTACLE COVER DUPLEX
TRANS/SUP	1.00	EACH	0403-0011	587B-151	SURGE SUPPRESSOR
1-3ID	3.00	EACH	0403-0051	746-IA16	SLC500 INPUT MOD 16PT 120V
SLDT6	1.00	EACH	0403-0052	1746-N2	SLC500 SLOT FILLER
SLDT0	1.00	EACH	0403-0059	1747-L532	SLC 5/03 PROCESSOR
PLC	1.00	EACH	0403-0061	1746-A7	PLC RACK 7 SLOT
PLC	1.00	EACH	0403-0062	1746-P2	POWER SUPPLY FOR SLC 5/03 IO
4ID	1.00	EACH	0403-0069	1746-N14	INPUT MODULE 4-20 mA
5ID	1.00	EACH	0403-0065	1746-0A16	16 POINT OUTPUT MODULE
AIC	1.00	EACH	0403-0066	1747-A1C	ISOLATED LINK COUPLER
DISPLAY	1.00	EACH	0424-0004	2706B23J8	OPTICAL ISOLATION
8PB	1.00	EACH	0403-0006	800T-YA	2-LINE DL20 W/8K RAM
SDLA	1.00	EACH	0403-0520	SLS-24-012	CONTACT BLOCK
1-2SS	2.00	EACH	0405-0004	800T-1T2	POWER SUPPLY
1-2SS	2.00	EACH	0405-0006	800T-H17A	PUSHBUTTON ENCLOSURE
1-3LS	3.00	EACH	0406-0009	802X-H7	SELECTOR SWITCH
1-3LS	1.00	EACH	0406-0005	802T-W2B	LIMIT SWITCH
2LT	1.00	EACH	0408-0008	VW-XL-11GC	LEVER ARM
2LT	1.00	EACH	0408-0010	60A21/R	LIGHT FIXTURE
1-3SP	3.00	EACH	0809-0001	10mm	LAMP RED
2-4T	3.00	EACH	0809-0003	A06-SA6	SPARK PLUG
2-4T	30.00	FT	0809-0004	GTD-15	IGNITION TRANSFORMER 120V
1-3SP	3.00	EACH	0809-0008	#AEBF	IGNITION LEADWIRE
2-4T	30.00	FT	0809-0014	5239K145	90DEG PLUG CONNECTOR
4-6LT	3.00	EACH	0405-0043	800T-PT16	TEFLON TUBING 5/16" ID x 3/8" OD
4LT	1.00	EACH	0405-0037	800T-N26R	PILDT LIGHT
5LT	1.00	EACH	0405-0046	800T-N41	LENS: RED
ENC	1.00	EACH	0401-0081	FT 2781	PB16 LENS: GREEN
ENC	1.00	EACH	0401-0133	A-FR0618	COVER FOR CONTROLLERS
F15	1.00	EACH	0404-0113	FRN-R-1	FLDOR STAND KIT
F15-16	1.00	EACH	0404-0401	R25030-2SR	FUSE 250V
F16	1.00	EACH	0404-0129	FRN-R-5	FUSE 250V
F13-14	2.00	EACH	0404-0183	FRS-R-2	FUSE 600V
F13-14	1.00	EACH	0404-0400	R60030-2SR	FUSE BLOCK
2T	1.00	EACH	0409-0048	HS10F1AS	FUSE BLOCK
9LT	1.00	EACH	0401-0701	A-LF16D24	TRANSFORMER
9LT	1.00	EACH	0401-0701	BUL B 24"	ENCLDSURE LIGHT
9LT	1.00	EACH	0405-0047	800T-N42	PB16 LENS: AMBER
3-5SS	3.00	EACH	0405-0003	800T-16HG17KB6AX	ILL. SELECTOR SWITCH
13-15CR	1.00	EACH	0404-0017	700-MPX	MOUNTING STRIP
3, 10, 11 LT	1.00	EACH	0405-0083	LSB120	MOUNTING BASE
3LT	1.00	EACH	0405-0086	LSL120A	MOUNTING STRIP
10LT	1.00	EACH	0405-0088	LSL120R	AMBER LENSE
11LT	1.00	EACH	0405-0085	LSL120G	RED LENSE
					GREEN LENSE

STATION 'C' PATH=D:\620E\403502E5

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**LINDBERG/MPH**

P.O. BOX 131  
RIVERSIDE,  
MICHIGAN 49084  
1-616-849-2700 PHONE  
1-616-849-3021 FAX

TYPE: 62-ARP-3500  
PART: PANEL LAYOUT

DATE: 5-7-97 DRAWN BY: PMY CUSTOMER:  
TO BUILD: CHKD: DK DWG. NO. 2040-3502E5