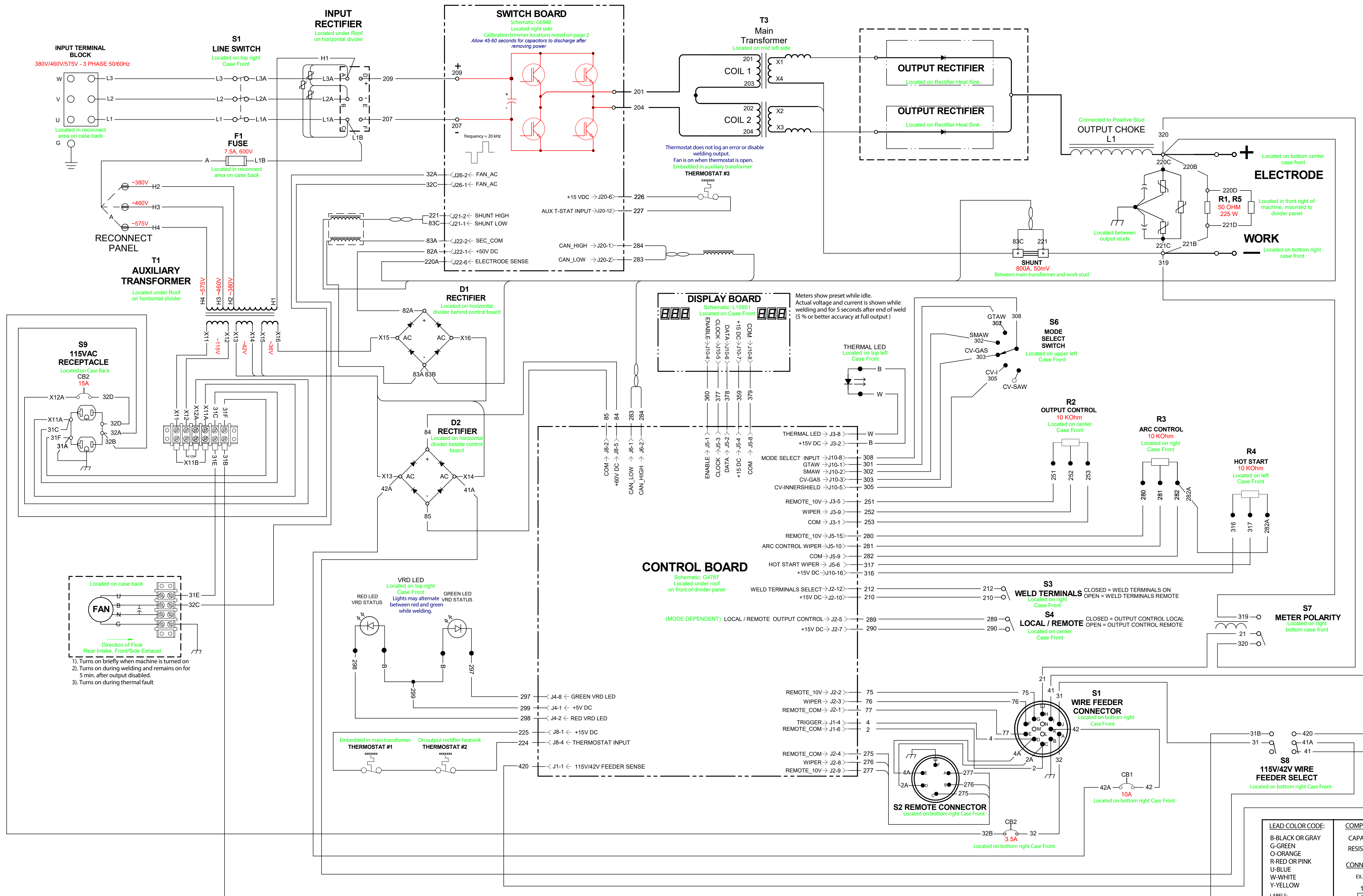


FLEXTEC 650 MACHINE SCHEMATIC G7201 REV: D



**COMPONENT VALUE UNITS:**  
CAPACITOR: MFD/VOLTS  
RESISTOR: OHMS/WATTS

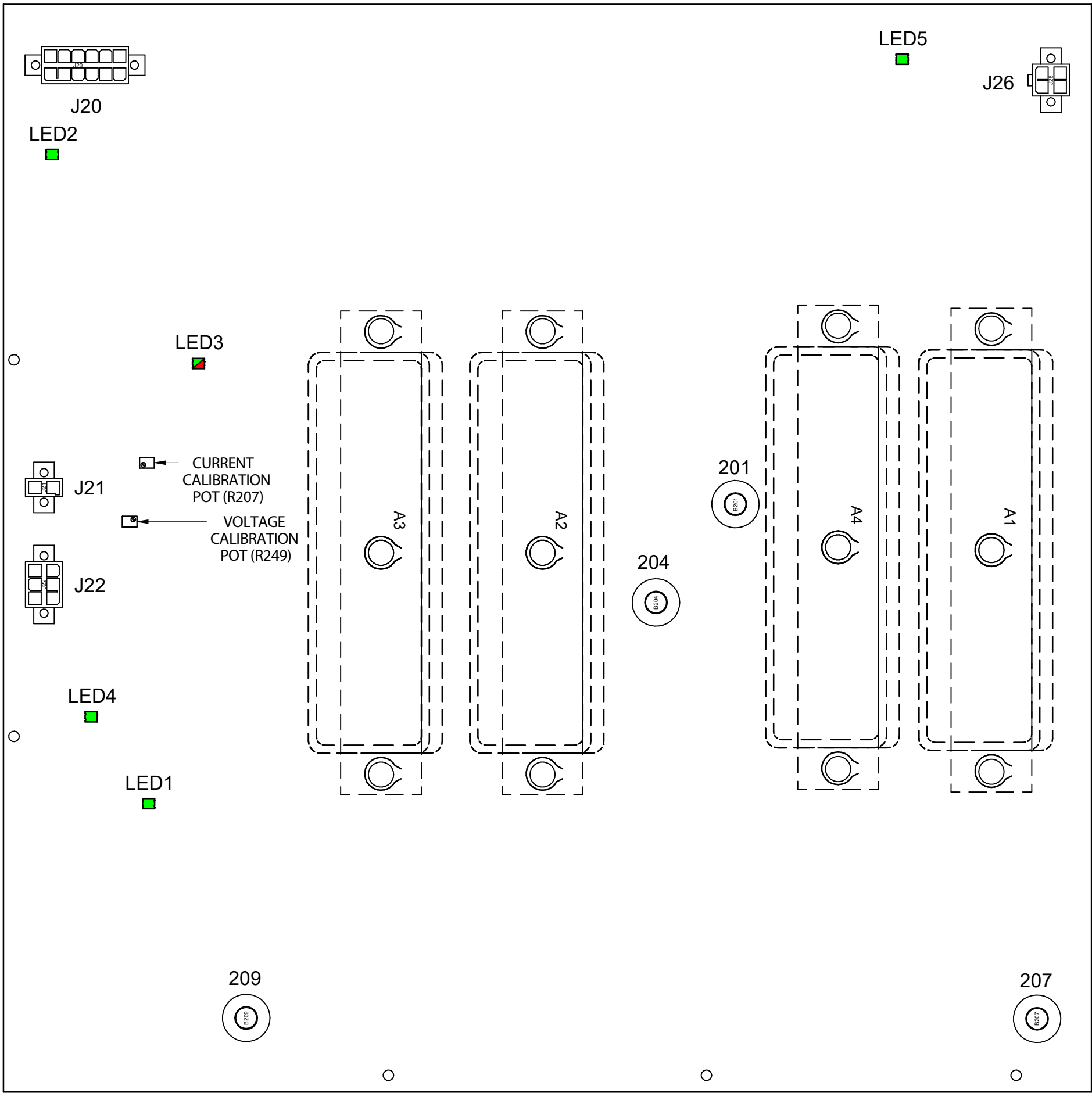
**CONNECTOR PIN NUMBERS:**

EX. 12 PIN CONNECTOR

1 2 6  
7 12  
LATCH

VIEW OF CONNECTOR ON PC BOARD

SWITCHBOARD  
P.C. BOARD

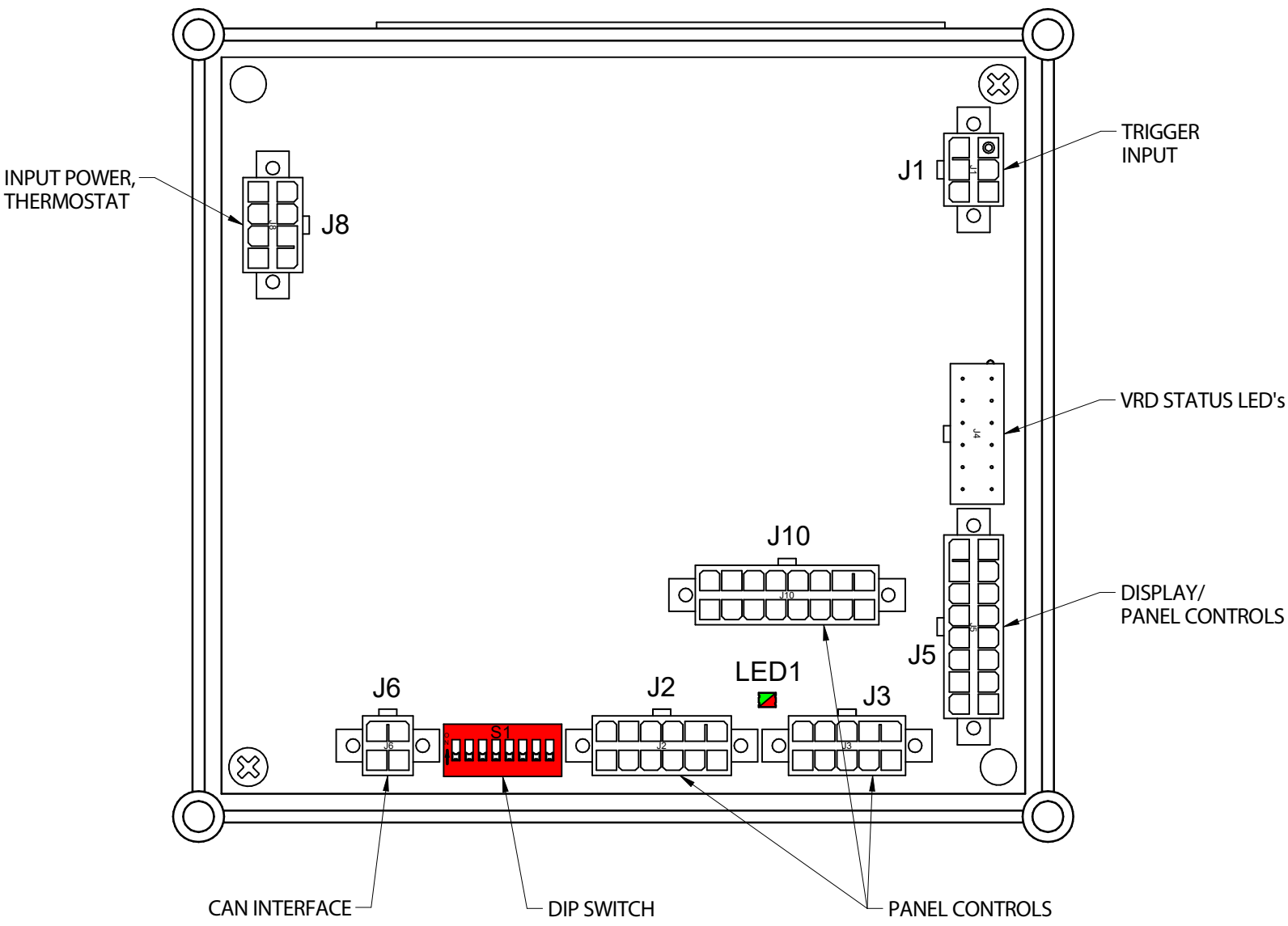


S28867-[ ] SWITCHBOARD		
LED #	COLOR	FUNCTION
1	GREEN	+5V DC POWER SUPPLY "OK"
2	GREEN	CAN POWER SUPPLY "OK"
3	GREEN	STATUS "OK"
3	RED	STATUS "ERROR" (CHECK CODE FOR SPECIFIC ERROR)
4	GREEN	+15V DC POWER SUPPLY "OK"
5	GREEN	FAN "ON"

USING THE FLEXTec 650 SWITCHBOARD STATUS LED

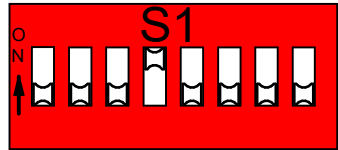
LIGHT CONDITION	MEANING
Steady Green	System OK.
Blinking Green	Occurs during startup or reset, and indicates that the switchboard is waiting for communication from the control board. Normal for the first 1-10 seconds after power is turned on.
Alternating Green and Red	A system fault has occurred. If the switchboard status LED is flashing any combination of red and green, errors are present.  Individual code digits are flashed in red with a long pause between digits. If more than one code is present, the codes will be separated by a green light.  See Page 3 for an Error Code Troubleshooting Guide.

CONTROL  
P.C. BOARD



S28868 CONTROL P.C. BOARD		
LED #	COLOR	FUNCTION
1	GREEN	STATUS "OK"
1	RED	STATUS "ERROR" (CHECK CODE FOR SPECIFIC ERROR)

TEST MODE CONFIGURATION



TURN ON PIN FOUR TO ENABLE TEST MODES  
ALL SWITCHES ARE OFF BY FACTORY DEFAULT

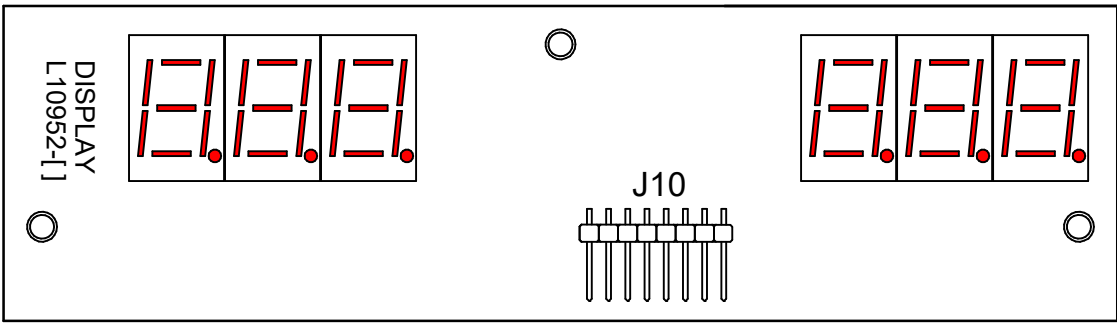
USING THE FLEXTec 650 CONTROL BOARD STATUS LED

LIGHT CONDITION	MEANING
Steady Green	System OK.
Alternating Green and Red	A system fault has occurred. If the Control Board status LED is flashing any combination of red and green, errors are present.  Individual code digits are flashed in red with a long pause between digits. If more than one code is present, the codes will be separated by a green light.  See Page 3 for an Error Code Troubleshooting Guide.

VRD Setup

Input Voltage (3 phase, 50/60Hz)	Control Board DIP Switch Configuration
380V	
460V	
575V	

DISPLAY  
P.C. BOARD



CONSTANT VOLTAGE TEST MODE

To enable Constant Voltage test mode:

- Set dip switch #4 to ON
- Set "WELD TERMINALS" switch to " " (checked)
- Set "MODE SELECT" knob to "GTAW"
- Set "LOCAL/REMOTE" switch to "LOCAL"
- Set "ARC CONTROL" knob to "+10"
- Turn on input power.
- Use the "OUTPUT CONTROL KNOB" to adjust the setpoint to a desired value on the right display
- Use the "WELD TERMINALS" switch to enable and disable output

CONSTANT CURRENT TEST MODE

To enable Constant Current test mode:

- Set dip switch #4 to ON
- Set "WELD TERMINALS" switch to " " (checked)
- Set "MODE SELECT" knob to "GTAW"
- Set "LOCAL/REMOTE" switch to "LOCAL"
- Set "ARC CONTROL" knob to "-10"
- Turn on input power.
- Use the "OUTPUT CONTROL KNOB" to adjust the setpoint to a desired value on the right display
- Use the "WELD TERMINALS" switch to enable and disable output

ACCESS ERROR LOG

To access the Error Log:

- Set dip switch #4 to ON
- Set "WELD TERMINALS" switch to "ON"
- Set "MODE SELECT" knob to "GTAW"
- Set "LOCAL/REMOTE" switch to "LOCAL"
- Set "OUTPUT CONTROL KNOB" to "MIN"
- Set "ARC CONTROL" knob to "-10"
- Set "HOT START" switch to "ON"
- Turn on input power. The display will show "8.8.8" "8.8.8" and "THERMAL LED" will light
- The displays will then go to "- - -" and "THERMAL LED" will go out.
- Toggle the "WELD TERMINALS SWITCH" switch "OFF" and "ON" to step through menus
- Step C00 to C14 are control board error logs in chronological order.
- Step S00 to S14 are switch board error logs in chronological order.
- To clear error logs set the "LOCAL/REMOTE" switch to " " (checked) then back to "LOCAL"

ERROR CODE TROUBLESHOOTING GUIDE

31	Primary Overcurrent
Description	Peak current through the transformer primary has exceeded threshold (140 amps).
Possible Solution 1	Verify connections to the switchboard, transformer and output rectifier assemblies are made correctly and there are no damaged components in the machine.
Possible Solution 2	Replace defective main transformer.
Possible Solution 3	Replace defective switchboard assembly (S28443).
36	Thermal Fault
Description	Thermostat on output rectifier heat sink or embedded in transformer has tripped.
Possible Solution 1	Do not exceed allowable ambient temperature or duty cycle limits.
Possible Solution 2	Verify that fan is operating and airflow is not being blocked.
Possible Solution 3	Measure thermostats at control board and replace if defective.
711	Capacitor Fault (Over-Voltage or Under-Voltage)
Description	Input voltage is less than 160 VDC or more than 1050 VDC
Possible Solution 1	Verify input voltage level, frequency, and quality. Verify that line is not too soft.
Possible Solution 2	If problem occurs on a generator, verify proper operation when connected to municipal power lines.
Possible Solution 3	Replace defective switchboard assembly (S28443).
712	CAN Communication Timeout
Description	CAN communication between switchboard and control board has timed out.
Possible Solution 1	Check the physical wiring and connections between control board and switchboard.
Possible Solution 2	Verify power supply to control board and switchboard.
Possible Solution 3	Replace defective switchboard assembly (S28443) or control board (S28454).
713	Misconnection - Switchboard Supply Voltage too High
Description	Switchboard auxiliary supply voltage is higher than 62 VDC at machine power-up.
Possible Solution 1	Improper input voltage configuration. Verify primary reconnect position, measure input voltage level and check three phase operation.
Possible Solution 2	Damaged auxiliary transformer or intermittent "A" lead connection. Verify 42 VAC output at 14 pin connector to determine the source of the problem.
Possible Solution 3	Replace defective switchboard assembly (S28443).
714	Misconnection - Switchboard Supply Voltage too Low
Description	Switchboard auxiliary supply voltage is lower than 42 VDC at machine power-up.
Possible Solution 1	Improper input voltage configuration. Verify primary reconnect position, measure input voltage level and check three phase operation.
Possible Solution 2	Damaged auxiliary transformer or intermittent "A" lead connection. Verify 42 VAC output at 14 pin connector to determine the source of the problem.
Possible Solution 3	Replace defective switchboard assembly (S28443).
715	Switchboard Undervoltage Lock Out
Description	Switchboard auxiliary supply voltage momentarily drops below 20 VDC.
Possible Solution 1	Damaged auxiliary transformer or intermittent "A" lead connection. Verify 42 VAC output at 14 pin connector to determine the source of the problem.
Possible Solution 2	Verify input voltage level, frequency, and quality. Verify that line is not too soft.
Possible Solution 3	Replace defective switchboard assembly (S28443).
717	Control Board Misconfiguration
Description	A jumper on the control board has been placed in the incorrect position.
Possible Solution 1	Verify that the wiring to connector J5 on the control board matches the machine wiring diagram.
Possible Solution 2	Replace defective control board assembly (S28454).
21, 24, 716, 718	Internal Control Board Error
Description	The microprocessor on the control board has experienced a critical internal error and cannot continue.
Possible Solution 1	Cycle power to the machine.
Possible Solution 2	Replace defective control board assembly (S28454).
719	Internal Switchboard Error
Description	The microprocessor on the switchboard has experienced a critical internal error and cannot continue.
Possible Solution 1	Cycle power to the machine.
Possible Solution 2	Replace defective switchboard assembly (S28443).