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UWC ™

UNIVERSAL WELD CONTROL

Operation / Installation Manual

Manual Part Number: S8M5015
Date Revised: April 4, 2018

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1.0 GENERAL DESCRIPTION

1.1 Overview

The following is a brief description of the UWC™ Universal Weld Control. The UWC controller is based on an embedded micro controller. The Controller provides two 0-10 VDC programmable outputs, one is used to control the power source. The second controls a Wire Feed Motor Drive Control. The third controls the travel drive control. The Controller provides 32 user selectable weld schedules.

1.2 Control Outputs

The controller has seven solid-state isolated relay outputs. They have the following default configuration:

- **CR7 - Ready** – This output is asserted when the Controller is operating normally. It will reset when the controller is in ESTOP or an Internal/External fault has occurred.

- **CR6 - Arc Active** – This output is asserted after the arc is established. The signal is generated from the power source. The output is cleared if a loss of arc is detected, internal Program fault, or the cycle start signal is reset.

- **CR5 - Cycle Complete** – This output is asserted when the programmed weld cycle has been completed. If a fault or loss of arc has occurred during the cycle the Cycle complete will not be set.

- **CR4 – Weld Fault** – This output is set when an Arc Start Fault or an Arc Active Fault has occurred and will be cleared when the next weld cycle is initiated.

- **CR3** – **Torch UP/DOWN** – This output is set by the activation of the Torch UP/DOWN switch. This output will be automatically set when a Cycle Start is initiated, the Auto Switch is in the auto mode and the system ready is asserted.

- **CR2** – **Spare Output** – Not defined but can be used for additional control functions with firmware change.

- **CR1** – **Spare Output** – Not defined but can be used for additional control functions with firmware change.

1.3 Control Inputs

The controller provides six 24 vdc optically isolated inputs. Three inputs are dedicated for Travel Reverse Limit, Travel Forward Limit and System Ready. These inputs must be provided by the user to allow operation of the automatic and travel control functions. The six inputs have the following default configuration:

- **INP 1 – SCHED 0** – User definable spare input. Under remote schedule mode this input can be used for weld schedule selection (Bit 0).

- **INP 2 – SCHED 1** – User definable spare input. Under remote schedule mode this input can be used for weld schedule selection (Bit 1).

- **INP 3 – SCHED 2** - User definable spare input. Under remote schedule mode this input can be used for weld schedule selection (Bit 2).

- **INP 4 – System Ready** – Input 4 is used to enable the UWC auto motion functions. This input must be asserted when the travel carriage is free to move. To enable the UWC auto weld function assert this input. To disable the automatic UWC auto function connect this input to I/O common (WHT/BLK) wire in the I/O cable.

- **INP 5 – Travel Carriage Forward Limit Switch** – Input 5 is the N.C. contact from the Travel carriage forward travel limit switch. This input must be active to allow the user to jog the travel carriage forward. If not being used this input should be connected to the +24 power (RED/BLK) wire in the I/O Cable.

- **INP 6 – Travel Carriage Reverse Limit Switch** - Input 6 is the N.C. contact from the Travel carriage forward travel limit switch. This input must be active to allow the user to jog the travel carriage forward. If not being used this input should be connected to the +24 power (RED/BLK) wire in the I/O Cable.

1.4 Remote Schedule Select

Note: The values stored in the UWC weld schedule parameters must be entered and saved by the operator prior to use of the Weld Control. Improper weld schedule parameter values may result in damage to the part being welded and to equipment.

Caution should be used when selecting weld schedules during the weld process. The weld control will load and run the saved values for the schedule selected through the Remote I/O when the Remote Schedule Select Mode is active. Any change in the state of the Remote I/O will generate a schedule change.

When activated the Remote Weld Schedule select function will allow the Binary selection of weld schedules using inputs 1 through 3 (8 Schedules). The user must enter and save the desired Weld Schedule Parameter Values prior to the use of the Weld Control. (See 2.4 Setting and Changing Weld Schedule Parameters.) During the Weld Process any changes to the Weld Schedule Parameters will take effect immediately.

If the user wishes to make a change to a weld schedule other than the schedule selected through the Remote I/O, the user must select the correct schedule through the Remote I/O (Binary) and then make the desired changes or disable the Remote Schedule Select Function and load the desired schedule to change using the Front Display Panel and then make the desired changes. (See 2.4 Setting and Changing Weld Schedule Parameters.)

BINARY Remote Input Weld Schedule Table

SCHEDULE	IN1	IN2	IN3	IN4	IN5
1	0	0	0	0	0
2	1	0	0	0	0
3	0	1	0	0	0
4	1	1	0	0	0
5	0	0	1	0	0
6	1	0	1	0	0
7	0	1	1	0	0
8	1	1	1	0	0

1.5 Automatic Control Functions

The UWC control has two automatic control functions that are active only when the Auto switch is in the AUTO position and the System Ready input is asserted. The following is a description of the automatic routines:

1. **Auto Home** - To activate the Auto home function set the Auto/Man switch to the AUTO Position. Press the ESTOP Button. Restore the ESTOP button. If the SYSTEM READY input to the UWC is asserted the Reverse Travel Drive will be activated at 85% of full speed and will continue until the REVERSE LIMIT is reached. The motor drive will be disabled and a 0.25 second Dynamic Brake delay is initiated. After the Brake delay time the Travel speed is set to 5% of full speed. If the REVERSE LIMIT is still open then the Forward Drive command is executed until the Reverse limit is active. This completes the Auto Home routine. If The SYSTEM READY input is not active at the Start of the Auto Home routine The CYCLE START Lamp will blink. To activate the Auto Home routine press the CYCLE START button. After completing the Auto Home routine press the cycle start button to release the switch.

2. **Auto Weld End** - To activate this function set the AUTO/MAN switch to the Auto position. Start a weld cycle and the TORCH DOWN relay will be activated during the Prepurge Weld Event. The Weld cycle is then initiated at the end of the Prepurge time. During the Weld event the UWC will monitor the FORWARD LIMIT switch. If the SYSTEM READY and AUTO input are active the Weld will be terminated when the limit is tripped. If the READY and AUTO inputs remain active at the end of the Post Purge event the Auto Home functions will be initiated. You can use the Pre and Post purge timers to set a delay time for activating the Up/Down Head function. The Torch Down output is set at the start of the Prepurge time and is released at the start of the post purge time. The Weld On signal is not asserted until the end of the Prepurge Time. The Auto Home function is not activated until the end of the Post Purge time.

2.0 CONTROL SPECIFICATION

2.1 UWC Standard Enclosure Specification

The UWC consists of five P.C. Board assemblies. A Main CPU P.C. board, an I/O P.C. Board, an Analog Travel Control P.C. Board, a 150 VDC PWM Travel motor control assembly and a Display/Keypad P.C. Board and a two-line 16-character LCD display. All external user connections are made via plug in connectors and external wiring harness. The controller is designed to allow the addition of a 2nd PWM motor drive controller, which can be used to control an external Wire Feed system. The wire drive PWM module is installed inside the control enclosure. This consists of a transformer, power supply P.C. Board assembly, and PWM motor control P.C. Board assembly and wiring harness.

2.2 Control Cables and Connectors

The enclosure has a 14-pin AMP CPC Power Supply Control connector to interface to a welding power source, a 16-pin CPC Remote I/O connector and a rigid mounted 6 ft 115 VAC molded cable is used to provide power to the controller. A 12 Pin PT06 style connector is used to connect the travel motor and optional encoder. A five-pin TURCK style micro connector is provided to allow interconnection of the external voltage and current sensor. A RS-232-C Female DB-9 connector is provided to allow off-line programming of the weld schedules.

2.3 Controls and Status Indicators

The following is a summary of the control switches and status indicators:

- **POWER SWITCH** – Illuminated rocker switch applies power to the controller.
- **PROGRAM/RUN –** Key Lock switch that enables the UWC program mode. When the switch is in the program position the user has full access to the controller weld schedules and configuration parameters. When set in the program position the operator can only change the parameters enabled within a specified high/low limit. To **save schedule** changes entered in the Program Mode the key switch must be rotated back to the **RUN** Position. If the UWC is powered down prior to rotating the key switch to the RUN position the **changes will not be saved**.
- **SELECT –** This momentary pushbutton switch is used to select the UWC parameter to be modified. Editing of the selected parameter is only allowed when the key switch is in the program position.
- **INC /DEC –** These two momentary push buttons are used to increase or decrease the selected parameter. Editing of the selected parameter is only allowed when the key switch is in the program position.
- **CYCLE START/STOP –** A Push-On, Push-Off Illuminated button is used to start and stop the weld cycle. When the weld cycle is active the button will be illuminated.
- **MODE AUTO/MANUAL –** A two position toggle switch is used to activate the auto weld events. When set to the AUTO position the UWC auto weld functions will be enabled. When set to the MAN position the internal UWC auto functions are disabled.
- **ESTOP –** The ESTOP button is intended for emergency halt of all UWC control functions. When pressed, the UWC enters an emergency stop mode and all outputs will be cleared

and the external I/O power is disconnected. The UWC will display a *"**SYSTEM ESTOP**"* message. All Input and Output functions are disabled in the ESTOP mode. The RS-232 is still active in this mode.

- **JOG WIRE FWD/REV –** A Center-Off toggle switch is used to jog an optional wire drive system. Rotating the switch to the FWD position will jog the optional wire drive control in the forward (down) direction. Rotating the switch to the REV position will jog the optional wire drive control in the reverse (Up) direction.

- **JOG TRAVEL FWD/REV –** A Center-Off toggle switch is used to jog the Travel drive system. Rotating the switch to the FWD position will jog the Travel drive control in the forward (CW) direction. Rotating the switch to the REV position will jog the Travel drive control in the reverse (CCW) direction. ***Note:*** *The user supplied limits must be asserted to allow the Jog Travel function. If the Limits switch is open the Jog function will be disabled.*

- **TORCH UP/DOWN -** This toggle switch allows the user to activate the Torch Down output relay. When set to the Down position the Torch down CR3 relay is asserted. When set to the Up position the Torch Down relay is cleared.

2.4 Setting and Changing Weld Schedule Parameters

Setting the Weld Schedule Parameter Values is a simple process. Once the Weld Control has been installed and connected to the system the user must enter the desired Weld Schedule Parameter Values for the weld process (See Chapter 6). The parameter values can be entered through the front panel of the UWC or through the RS-232 connection using a terminal program and the terminal commands. (See Chapter 7 for Terminal Protocol.)

To enter changes to the UWC **SETUP PARAMETERS** perform the following:

- Rotate the **MODE** Key Switch to the **PGM** position.

- The UWC Display will read **Weld Parameters**. Press the **INC** or the **DEC** button.

- The UWC Display will read **Setup Parameters**. Press the **SELECT** button.

- The UWC Display will read **REMOTE SCHEDULE SELECT=NO** (Default Setting). If you **do not want** to change the REMOTE SCHEDULE SETTING press the **INC** button. If you want to **Enable** the REMOTE SCHEDULE SELECT press the SELECT button and then press the INC or the DEC button. The **NO** will change to a **YES**. Press the SELECT button to save the changed value. Use the same process to change the value to a NO to **disable** the REMOTE SCHEDULE SELECT function. To proceed to the next parameter, press the **INC** button.

- The UWC Display will read **GTAW Mode=NO** (default setting). If you **do not want** to change the **GTAW Mode** press the **INC** button. If you want to **Enable** the GTAW Mode press the SELECT button and then press the INC or the DEC button. The **NO** will change to a **YES**. Press the SELECT button to save the changed value. Use the same process to change the value to a NO to **disable** the GTAW Mode function. To proceed to the next parameter, press the **INC** button.

- The UWC Display will read **GMAW Mode=NO** (default setting). If you **do not want** to change the **GMAW Mode** press the **INC** button. If you want to **Enable** the GMAW Mode press the SELECT button and then press the INC or the DEC button. The **NO** will change to a **YES**. Press the SELECT button to save the changed value. Use the same process to

change the value to a NO to **disable** the GMAW Mode function. To proceed to the next parameter, press the **INC** button.

NOTE: If the GTAW and the GMAW Modes are disabled (=NO) the UWC will enter the PLASMA Mode.

- The UWC Display will read **WIRE DRIVE MOTOR ENABLED = OFF** (default setting). If you have purchased the optional Wire Drive Motor Control Option you will need to ENABLE the function by pressing the SELECT button and then press the INC or the DEC button. The **OFF** will change to a **ON**. Press the SELECT button to save the changed value. Use the same process to change the value to a NO to **disable** the WIRE DRIVE MOTOR function. To proceed to the next parameter, press the **INC** button.

- The UWC Display will read **LOW AMP RANGE MODE = OFF** (default setting). This Mode is for use with a **Welding Power Source** with a LOW AMP RANGE Mode **(0.5 – 15 AMP Range)**. If you **do not want** to change the **LOW AMP RANGE Mode** press the **INC** button. If you want to **Enable** the **LOW AMP RANGE Mode** press the SELECT button and then press the INC or the DEC button. The **OFF** will change to a **ON**. Press the SELECT button to save the changed value. Use the same process to change the value to a OFF to **disable** the **LOW AMP RANGE** function. To proceed to the next parameter, press the **INC** button.

- The UWC Display will read **VOLT DAC GAIN=XXX** if in the GMAW Welding Mode or **CURRENT DAC GAIN=XXX** if in the GTAW or PAW Welding Mode. If you **do not want** to change the **DAC GAIN** value press the INC button. The Volt DAC gain value is determined by the following equation: DAC GAIN = (400 / ($VOLT_{max}$ – $VOLT_{min}$). Example: 400/(45.0 – 12.0) = 12. The Current DAC gain value is determined by the following equation: DAC GAIN = (4000 / (AMP_{max} – AMP_{min}). Example: 4000/(400 – 10) = 10. To change the DAC GAIN value press the SELECT button and then press and hold the INC or the DEC button until the desired value is displayed. Press the SELECT button to save the changed value. To proceed to the next parameter, press the **INC** button.

- The UWC Display will read **MIN VOLTAGE =XXX** if in the GMAW Welding Mode or **MIN CURRENT =XXX** if in the GTAW or PAW Welding Mode. If you **do not want** to change the **MIN CURRENT Value** press the **INC** button. To change the MIN VOLTAGE/MIN CURRENT value press the SELECT button and then press and hold the INC or the DEC button until the desired value is displayed. Example: If the Welding Power Source MIN Voltage Output = 12 Volts enter the value 12. Press the SELECT button to save the changed value. To proceed to the next parameter, press the **INC** button.

- The UWC Display will read **WIRE DAC GAIN=XXX**. If you **do not want** to change the **WIRE DAC GAIN Value** press the **INC** button. The Wire DAC gain value determined by the following equation: DAC GAIN = (4000 / ($Wire_{max}$ – $Wire_{min}$). Example: 4000/(550 – 100) = 9. To change the WIRE DAC GAIN value press the SELECT button and then press and hold the INC or the DEC button until the desired value is displayed. Press the SELECT button to save the changed value. To proceed to the next parameter, press the **INC** button.

- The UWC Display will read **MIN WIRE SPEED=XXX**. If you **do not want** to change the **MIN WIRE SPEED Value** press the **INC** button. To change the MIN WIRE SPEED value press the SELECT button and then press and hold the INC or the DEC button until the desired value is displayed. Press the SELECT button to save the changed value. To proceed to the next parameter, press the **INC** button.

- The UWC Display will read **TRAVEL DAC GAIN=XXX**. If you **do not want** to change the **TRAVEL DAC GAIN Value** press the **INC** button. The Travel DAC gain value determined by the following equation: DAC GAIN = (400 / ($Travel_{max}$ – $Travel_{min}$). Example 400/(100.0 –

0) = 4. To change the TRAVEL DAC GAIN value press the SELECT button and then press and hold the INC or the DEC button until the desired value is displayed. Press the SELECT button to save the changed value. To proceed to the next parameter, press the **INC** button.

- The UWC Display will read **MIN TRAVEL SPEED=XXX**. If you **do not want** to change the **MIN TRAVEL SPEED Value** press the **INC** button. To change the MIN TRAVEL SPEED value press the SELECT button and then press and hold the INC or the DEC button until the desired value is displayed. Press the SELECT button to save the changed value. To proceed to the next parameter, press the **INC** button.

- The UWC Display will read **ARC ACTIVE AMPS=10 (Default Value)**. If you **do not want** to change the **ARC ACTIVE AMPS Value** press the **INC** button. To change the **ARC ACTIVE AMPS** value press the SELECT button and then press and hold the INC or the DEC button until the desired value is displayed. Press the SELECT button to save the changed value. If the value selected is greater than the welding current you will receive an ARC FAIL FAULT every time you try to weld. If this value is set to 0 (Zero) the UWC will not test current for the ARC FAULT process. To proceed to the next parameter, press the **INC** button.

- The UWC Display will read **ARC ACTIVE VOLTS=4.0 (Default Value)**. If you **do not want** to change the **ARC ACTIVE VOLTS Value** press the **INC** button. To change the **ARC ACTIVE VOLTS** value press the SELECT button and then press and hold the INC or the DEC button until the desired value is displayed. Press the SELECT button to save the changed value. If the value selected is greater than the welding voltage you will receive an ARC FAIL FAULT every time you try to weld. If this value is set to 0 (Zero) the UWC will not test voltage for the ARC FAULT process. To proceed to the next parameter, press the **INC** button.

To EXIT the SETUP Mode at any time, rotate the MODE Key Switch back to the RUN Position.

NOTE: When the MODE Key is placed from the PGM Position to the RUN position the UWC will save any and all changes made to the current schedule displayed.

To enter changes to the UWC **WELD PARAMETERS** perform the following:

- Rotate the **MODE** Key Switch to the **PGM** position.

- The UWC Display will read **Weld Parameters**. Press the SELECT button.

- The Parameters displayed will change by the weld process selected. See Chapter 6 for a list of Parameters by Weld Process.

- Used the **INC** or **DEC** buttons to move forward or backwards until the desired Parameter is displayed. Press the **SELECT** Button. Use the **INC** or **DEC** key to change the Parameter to the desired value. Press the **SELECT** button to save the value to the schedule.

- To EXIT the Weld Parameter Mode and save changes, rotate the MODE Key Switch back to the RUN Position.

2.5 System Specifications

The following are the system specifications:

Weld Sequence Controller:

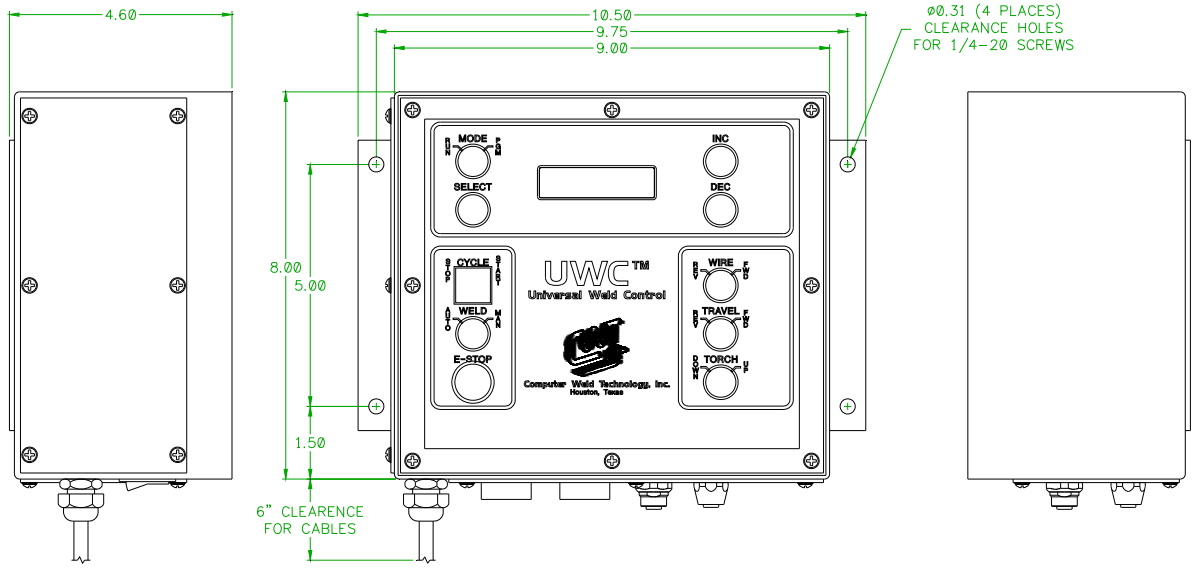
Dimensions:	8.0” H x 10.5” W x 4.6” D (203mm x 267mm x 117mm)
Power Input:	110 vac 50/60 hz @4 amps
Operating Temp:	-10 ° F to +140° F (-23°C to +60°C)
Relay Outputs:	24vdc @ 0.25 amp normally open contact
Switch Inputs:	5 - 24 vdc @ 1.0 - 8.0 ma.
Analog Outputs:	10 vdc precision reference output. 10 bit resolution (10 mv resolution) Maximum output current 10 ma. Output is short circuit protected.
Encoder Input:	Pulse accumulator input 5.0 vdc TTL level with 4.7K pull-up. Maximum input frequency 15 kHz.
Volt Sensor:	0-100 vdc; 10bit resolution accuracy ±2% Full Scale
Current Sensor:	0-800 amps; 10 bit resolution; Accuracy ±2% Full Scale
Travel Motor Drive:	0-90 vdc @ 3.0 amps; Speed regulation with Tachometer ±1% of full speed; Speed regulation with BEMF control ±3% of full speed

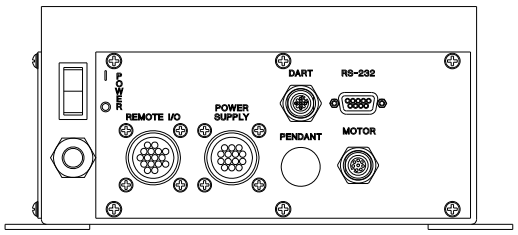
3.0 CONTROL INSTALLATION

3.1 Enclosure Installation

Install the Enclosure in a convenient location that allows easy operator access to the front control panel. Allow a minimum clearance of 6" (152mm) from the bottom of the enclosure to allow access for the external cable connections. Permanently mount the enclosure using the four mounting holes and ¼-20 mounting hardware. Connect the Power cable to a suitable source of AC power. Connect the Power supply remote cable to the "POWER SUPPLY CONTROL" receptacle. Connect the remote control I/O cable to the user supplied PLC or Robotic controller. If the application requires an analog remote control of the Run time Volt/Current and Wire speed then connect the optional DART analog control cable to the user supplied 0-10 vdc source and the DART connector on the UWC enclosure. If the Wire feed option has been installed connect the motor control cable to the wire drive motor.

3.2 Standard Enclosure Dimensions





BOTTOM VIEW

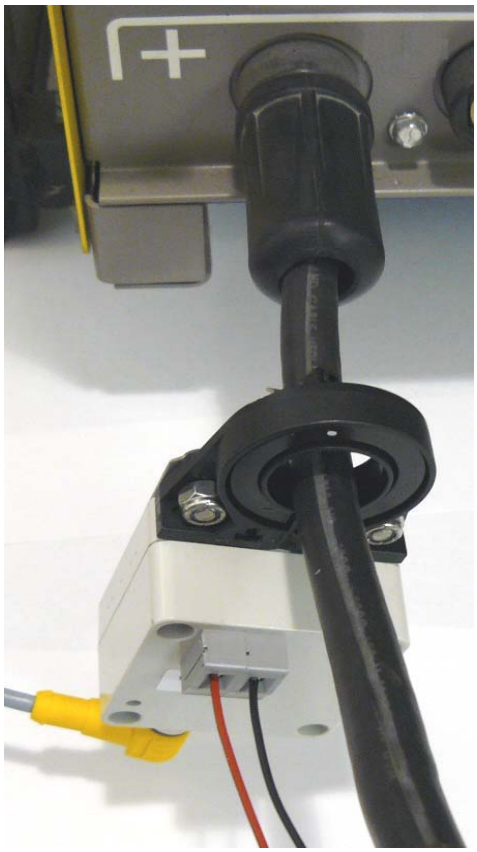
3.3 Sensor Installation

Install the Voltage/Current Sensor on the Welding Lead by feeding the welding cable through the Current Sensor opening with the **Welding Cable Support Bracket facing toward the most Positive Potential of the Power Supply**. The diameter of the opening will accommodate a 22 mm cable. If the crimp terminal is too large to fit through the opening then it must be removed and another terminal installed after the cable is passed through the opening. Use Two (2) 18 AGW conductors to connect the Voltage Sense Terminal Blocks of the Sensor to the Power Source. Connect the VOLTS + to the Positive terminal of the Power Supply and the VOLTS – to the Negative terminal of the Power Source.

Connect the Sensor Cable to the Voltage/Current Sensor and then to the Sensor Connector located on the bottom of the UWC.

NOTE: If the UWC Displays an ARC FAULT after the Voltage/Current Sensor has been first installed check the Positive and Negative Voltage connections first to insure correct polarity and that the terminals are tight. If the Voltage connections are correct and secure remove the sensor from the Welding Cable, rotate the sensor 180º and reinstall. Both the Voltage and Current Sensors are polarity sensitive.

WARNING: When installing the Volt/Current sensor on applications using an HIGH FREQUENCY ARC Starter the Voltage Sense Leads must be installed between the output of the Power Supply and the HIGH FREQUENCY ARC Starter. Connection of the Volt Sense leads on the Output side of the High Frequency ARC Starter can cause damage to the Volt/Current Sensor the UWC AND WILL VOID THE WARRANTY.



4.0 WELD SEQUENCE EVENTS

4.1 Weld Sequence Parameters

The UWC Universal Weld Control provides the following user defined parameters:

- **START VOLTS/CURRENT** – The value of current to be used during the start time event.
- **START TIME** – The amount of time to hold the start current before beginning the Ramp Up Event.
- **RAMP UP TIME** – The time required to ramp from the start current to the run current.
- **RUN VOLTS/CURRENT** – The value of current to be used during the Run time of the weld cycle. If the optional Remote Analog option is enabled this value will be controlled with the Analog 1 input
- **WELD TIME** – The user defined spot weld time when enabled.
- **% TAPER VOLTS/CURRENT** - The % of Run current used as the end current level for the taper time and the start of the Ramp Down Event.
- **TAPER TIME** – The amount of time required for the Current Taper Event.
- **RAMP DOWN TIME** – The amount of time required to ramp from the % Taper current value to the End current value prior to the End Current Event.
- **END VOLTS/CURRENT** - The end cycle current level to be used during the End Cycle Time.
- **END TIME** – The amount of time required for the end weld event.

4.2 Pulse Weld Mode Parameters

If the Pulse mode is enabled, in the GTAW/PAW mode, the following parameters will be used to define the pulse conditions:

- **PULSE FREQUENCY** – Specifies the Pulse Frequency in Hz when the Pulse mode is enabled (MAX Frequency is 500 Hz, MIN Frequency is 0.6 Hz).
- **PULSE PERCENT ON** – Specifies the Pulse ON Percent when the Pulse mode is enabled.
- **% PULSE CURRENT** – Specifies the percent of the Run current that will be used during the Pulse Off time period.

> ***NOTE**: The UWC must be placed in the PULSE Mode prior to the start of the Weld Sequence. If the PULSE Mode is enabled prior to the start of the weld sequence the operator may Enable or Disable the PULSE function at anytime during the weld sequence.*

4.3 Weld Cycle Events

The Weld cycle is initiated by asserting the Cycle Start Input. The controller will monitor the actual weld current and voltage and will assert the Active output when active. The controller will set the power source to the value specified by the Start Volt/Current Parameter. After the Start time has expired the Volt/Current output would be ramped to the Run Volt/Current value over the Ramp Up time specified. At the end of the Ramp Time the Run Volt/Current value will be active. If the Pulse mode is enabled, in the GTAW/PAW mode, the Pulse On time will be used to specify the time at Peak Current. The Pulse Off Time and Percent Current will be used to define the background pulse condition. If the Spot Time is Disabled the controller will continue to operate in the Run Event. When the Cycle Start is reset the controller will begin the Taper Time and ramp the Run Volt/Current to the level specified by the Percent Taper parameter. If the Pulse mode is enabled in the GTAW/PAW mode, the pulsing will start during the Ramp Up event and will continue through the ramp down event. At the end of the ramp down time the controller will set the End Volt/Current value and will hold this value for the time specified by the End Time parameter. The Cycle Complete will be asserted at the end of the weld cycle when the Arc Active Signal has been cleared when the welding Volts or current fall below minimum limits. The Cycle complete will remain set until the next Cycle start is asserted. To disable any weld event set the associated time to zero.

4.4 Spot Weld Mode

If the Spot Time mode is enabled the Taper Event will be started at the end of the Spot Weld Time. Then the normal end events will be executed. In this mode the Cycle Start must be active until the end of the weld cycle. The Controller will not reset the weld event until the Cycle input has been cleared. The Cycle complete will be asserted when the Arc Active Signal is cleared. The Cycle Complete Output will be cleared when the Cycle start is cleared. To enable the spot weld mode enter a time into the “Spot Weld Time” parameter. To disable the spot-weld mode set the “Spot Weld Time” to zero.

4.5 Arc Active Test

If the welding voltage and current are not above the user defined minimum limits within the weld schedule specified start time after the cycle start has been asserted, the controller will clear the weld event and set the FAULT CR4 output and an “ARC ACTIVE FAULT” message will be displayed on the UWC display.
If the Cycle start input is cleared prior to the weld event the controller will terminate the arc and will not set the Cycle Complete output.

5.0 USER INTERFACE

5.1 Remote Control Interface Specification

The UWC Controller provides a remote control interface that allows the user to connect an external PLC or robotic control to the UWC. The interface provides remote schedule select, cycle start and operational status indication. The UWC inputs are opto-isolated and configured to operate from an 8 to 36 VDC power source. The inputs by default are configured for Pull-Up (Sourcing). They can be configured for Pull Down (Sinking) by setting the internal jumper JP22 to the "A" position on the terminal PC board.

A 12 VDC @ 200MA power supply (TB8) is provided to allow dry contact closures to activate the UWC inputs. An external user supplied 24 VDC power source may also be used to power the UWC I/O by setting the JP19 jumpers to "A&B" on the Terminal PC board.

All Relay Outputs are opto-isolated solid-state relays and will switch AC/DC loads up to 120 VAC at 1 amp. The User Outputs are, by Default, configured for Pull-Up (Sourcing). They can be configured for Sinking (Pull-Down) by setting the internal jumper JP21 to the "B" position on the Terminal PC board. To use the relay outputs as a dry contact remove the jumper from JP21. All of the Output relays are connected to a single Output common on the I/O remote connector.

An optional analog remote control cable can be used to control the run time Volt/Current and the Wire speed. The analog 0-10 VDC inputs are scaled by the user defined Max/Min ranges for the Volt/Current and Wire Speed, as set in the UWC "Config System" menu. To activate this option the user must connect the two analog inputs to a 0-10 VDC source and connect the two enable wires Blue and Red together using a dry relay contact or wire nut.

5.2 Remote Control Interface

The UWC controller allows remote control capabilities for use with PLC or robotic controllers, or manual user pendant. The control provides a 24-vdc interface that allows the user to set Travel limits and enable/disable auto execute functions. The controller provides a simple hand shaking output that allows the Host controller to validate the weld sequence. Four 24 VDC sourcing relay outputs provide the following information to the host controller:

- **CR7 - Ready** – This output is asserted when the Controller is operating normally. It will reset when the controller is in ESTOP or an Internal/External fault has occurred.
- **CR6 - Arc Active** – This output is asserted after the arc is established. The signal is generated from the power source. The output is cleared if a loss of arc is detected, internal Program fault, or the cycle start signal is reset.
- **CR5 - Cycle Complete** – This output is asserted when the programmed weld cycle has been completed. If a fault or loss of arc has occurred during the cycle the Cycle complete will not be set.
- **CR4 – Weld Fault** – This output is set when an Arc Start Fault or an Arc Active Fault has occurred and will be cleared when the next weld cycle is initiated.
- **CR3** – **Torch UP/DOWN** – This output is set by the activation of the Torch UP/DOWN switch. This output will be automatically set when a Cycle Start is initiated, the Auto Switch is in the auto mode and the system ready is asserted.

- **CR2** – **Spare Output** – Not defined but can be used for additional control functions with firmware change.

- **CR1** – **Spare Output** – Not defined but can be used for additional control functions with firmware change.

The interface also provides seven 24 VDC inputs that provide the following control functions:

- **INP 1 – SCHED 0** – User definable spare input. Under remote schedule mode this input can be used for weld schedule selection (Bit 0).

- **INP 2 – SCHED 1** – User definable spare input. Under remote schedule mode this input can be used for weld schedule selection (Bit 1).

- **INP 3 – SCHED 2** - User definable spare input. Under remote schedule mode this input can be used for weld schedule selection (Bit 2).

- **INP 4 – System Ready** – Input 4 is used to enable the UWC auto motion functions. This input must be asserted when the travel carriage is free to move. To enable the UWC auto weld function assert this input. To disable the automatic UWC auto function connect this input to I/O common (WHT/BLK) wire in the I/O cable.

- **INP 5 – Travel Carriage Forward Limit Switch** – Input 5 is the N.C. contact from the Travel carriage forward travel limit switch. This input must be active to allow the user to jog the travel carriage forward. If not being used this input should be connected to the +24 power (RED/BLK) wire in the I/O Cable.

- **INP 6 – Travel Carriage Reverse Limit Switch** - Input 6 is the N.C. contact from the Travel carriage forward travel limit switch. This input must be active to allow the user to jog the travel carriage forward. If not being used this input should be connected to the +24 power (RED/BLK) wire in the I/O Cable.

5.3 Remote I/O Connector Pin Out

The Remote I/O Connector located on the bottom panel provides the Remote control functions. The user must connect the PLC, Robot I/O, or manual pendant to the Remote I/O Connector using the UWC I/O cable assembly (P/N S3W5099). The following is the pin out for the Remote Pendant connector.

Pin	Mode	Description
1	Input	INP1 – 24 VDC input .Schedule bit 0 input when enabled
2	Input	INP2 – 24 VDC input .Schedule bit 0 input when enabled
3	Input	INP3 – 24 VDC input .Schedule bit 0 input when enabled
4	Input	INP4 – 24 VDC input System Ready input
5	Input	INP5– 24 VDC Input. Travel Speed carriage Forward limit N.C. input
6	Input	INP6 – 24 VDC Input. Travel Speed carriage Reverse Limit Switch N.C. contact
7	Output	+24 I/O – Isolated unregulated 24 vdc @ 400 ma I/O power supply
8	Input	I/O COMMON – Common for Input and Output signals
9	Output	CR1 – Spare 1
10	Input	CR2 – Spare 2
11	Output	CR3 – Torch Down 24 VDC output asserted when the Torch UP/DWN switch is in the Down position. Will also be asserted when the Ready and Auto mode is asserted and the weld cycle start is active.
12	Output	CR4 – WELD FAULT -24 VDC output asserted when a arc on fail is detected
13	Output	CR5 - CYCLE COMPLETE – 24 VDC Output is asserted when the UWC weld event has successfully completed the weld event. Cleared when the CYCLE START input is cleared.
14	Output	CR6 - ARC ON – 24 VDC Output is asserted when the Weld Arc Active input signal is asserted. Cleared when Weld Input Arc Active is cleared.
15	Output	CR7 - READY - 24 VDC output asserted when UWC is functioning correctly
16		Chassis Ground – Shield connection for control cable

Table 1 – Remote Pendant Connector Pin out

5.4 Optional Analog DART connector pin out

The DART current probe control cable is used to provide run time Volt/Current values. The following is the pin out for the DART connector.

Pin	Mode	Description	Color
1	Output	The 10 VDC output signal to the current sensor probe	BRN
2	Input	The current sensor input signal from current sensor probe	WHT
3	Input	Analog common return from current sensor probe	BLU
4	Input	+ Arc voltage sense from current sensor probe	BLK
5	Input	- Arc Voltage sense from current sensor probe	GRY

Table 2 – DART analog cable/connector pin out

5.5 RS-232 Serial Port

All weld schedule programming can be performed off-line via a RS-232 serial port or using the internal display and program buttons. The Internal display allows the user to program all of the UWC weld sequence parameters and to configure the controller operational modes. It can also be used to Save and Load internal weld schedules.

Pin	Mode	Description
1	Output	Null modem jumper to PC input DCD (Pin 1)
2	Output	TD – Transmit data output to PC RD (Pin 2)
3	Input	RD – Receive Data Input from PC TD (Pin3)
4	Input	Null modem jumper to PC input DTR (Pin 4)
5	Input	COM – Signal common from PC COM (Pin 5)
6	Output	DSR – Data Set Ready to PC DSR (Pin 6)
7	N/C	No Connection
8	Output	Null modem jumper to PC input CTS (Pin 8)
9	N/C	

Table 3 – RS-232 Terminal Port Connector Pin out

5.6 Automated User Interface

The UWC controller allows full remote control capabilities for use with PLC or robotic controllers. The control provides a 24-vdc interface that allows the users to select weld schedules and to Start/Stop the welding sequence. The controller provides a simple hand shaking output that allows the Host controller to validate the weld sequence. Four relay outputs provide the following information to the host controller:

- **CR1 - Ready** – This output is asserted when the Controller is operating normally. It will reset when the controller is in ESTOP or an Internal/External fault has occurred.

- **CR2 - Arc Active** – This output is asserted after the arc is established. The signal is generated from the power source. The output is cleared if a loss of arc is detected, internal Program fault, or the cycle start signal is reset.

- **CR3 - Cycle Complete** – This output is asserted when the programmed weld cycle has been completed. If a fault or loss of arc has occurred during the cycle, the Cycle complete will not be set.

- **CR4 - Cycle Active** – This output is active during the complete weld cycle and will be cleared at the end of all programmed events.

The interface also provides seven 24 VDC inputs that provide the following control functions:

- **INP 1 – SCHED 0** – User definable spare input. Under remote schedule mode this input can be used for weld schedule selection (Bit 0).

- **INP 2 – SCHED 1** – User definable spare input. Under remote schedule mode this input can be used for weld schedule selection (Bit 1).

- **INP 3 – SCHED 2** - User definable spare input. Under remote schedule mode this input can be used for weld schedule selection (Bit 2).

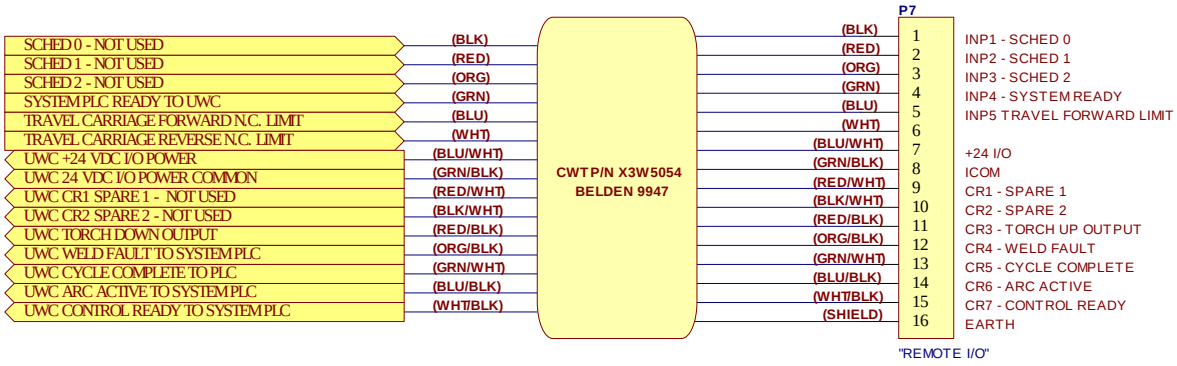
- **INP 4 – System Ready** – Input 4 is used to enable the UWC auto motion functions. This input must be asserted when the travel carriage is free to move. To enable the UWC auto weld function assert this input. To disable the automatic UWC auto function connect this input to I/O common (WHT/BLK) wire in the I/O cable.

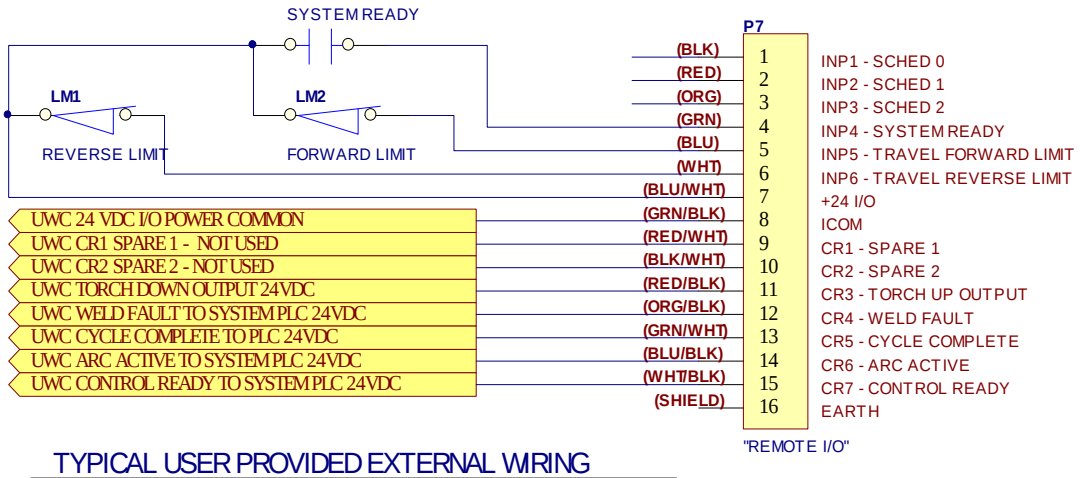
- **INP 5 – Travel Carriage Forward Limit Switch** – Input 5 is the N.C. contact from the Travel carriage forward travel limit switch. This input must be active to allow the user to jog the travel carriage forward. If not being used this input should be connected to the +24 power (RED/BLK) wire in the I/O Cable.

- **INP 6 – Travel Carriage Reverse Limit Switch** - Input 6 is the N.C. contact from the Travel carriage forward travel limit switch. This input must be active to allow the user to jog the travel carriage forward. If not being used this input should be connected to the +24 power (RED/BLK) wire in the I/O Cable.

To use the Remote control interface the user must connect the PLC or Robot I/O to the remote I/O cable provided with the UWC control assembly. The Remote Control function must be enabled via the RS-232 serial port terminal command.

5.7 Typical User Interface for Automated Operation





TYPICAL USER PROVIDED EXTERNAL WIRING

5.8 Power Source Control Connector

The Power Source Control Connector located on the rear panel provides the Remote Power Source control functions. The user must connect the welding power supply to the Power Source Connector using a power source specific control cable. Contact the factory for information and part numbers for various power source control cables. The following is the pin out for the Power Source Control connector.

Pin	Mode	Description
1	Output	DAC 1 – 0-10 VDC analog output for Voltage/Current control. Connect to power source remote reference wiper input
2	Output	D1COM – DAC 1 signal common connect to Power source remote reference LOW input
3	N/C	No internal connection
4	N/C	No internal connection
5	N/C	No internal connection
6	N/C	No internal connection
7	N/C	No internal connection
8	N/C	No internal connection
9	N/C	No internal connection
10	Output	Gas A - isolated Dry relay contactor output
11	Output	Gas B - isolated Dry relay contactor return
12	Output	WCR-A – Weld contactor isolated Dry relay contactor output
13	Output	WCR-B – Weld contactor isolated Dry relay contactor return
14	Output	Chassis Ground

Table 4 – Power Source Connector Pin out

6.0 OPERATIONAL DISPLAY AND PROGRAMMING

6.1 Static Weld Display Screens

The UWC controller provides a two-line 16-character display and four control switches that allow the user to program the weld variables and to select the various weld schedules. When not altering parameters, the display will indicate current status of the controller. The first line of the display will show the product type message. The second line will show the current set point value for the analog outputs that are enabled. The values displayed are the final values for each weld cycle event. The values are not varied during the ramp or pulse event but are set to the end or peak values. The actual values displayed are the result of the control mode and options installed. The following are the various Weld active Display screens that will be displayed, during a weld cycle, on the second line of the display.

DISPLAY	MESSAGE DESCRIPTION
VOL=##.# AMP=### TVS##.# WFS=###	This screen will be displayed for PAW and GTAW mode when the wire drive option is not installed. (Where: ### is the current set point or measured value)
VOL=##.# AMP=### TVS##.# WFS=###	This screen will be displayed for PAW and GTAW mode when the wire drive option is installed. (Where: ### is The current set point or measured value)
VOL=##.# AMP=### TVS=##.# WFS=###	This screen will be displayed for GMAW mode. (Where: ### is The current set point or measured value)

Table 1 – Static Screen Display Message

6.2 Static Display Screen Error Messages

During the weld cycle the UWC controller performs diagnostic checks on the system and control inputs. If an error occurs the UWC will display the error message on the second line of the static message screen. The following is a summary of the error messages:

DISPLAY	ERROR MESSAGE DESCRIPTION
SCHED 1 READY!	No Errors. Normal static message screen displays active schedule number.
PGM EVENT ERROR!	Program Event Error indicates the active weld schedule has an invalid event enabled. Error is automatically reset when Cycle start is cleared.
ARC ACTIVE FAIL!	The Start parameters are being ramped to the run level and the Ramp time delay is active.
SCHEDULE FAULT!	Schedule Fault Error indicates the active weld schedule has an invalid parameter. This error will occur when an out-of-range parameter is detected during a weld cycle. Error is automatically reset when Cycle start is cleared.
SYSTEM ESTOP	ESTOP message indicates that the UWC controller has been forced into a Emergency stop condition by clearing the UWC ESTOP input. When the ESTOP mode is active all UWC outputs and weld events are cleared. The only recovery is to assert the ESTOP input signal.

Table 2 – Displayed Error Messages

6.3 Modifying Weld Schedule and System Parameters

TERMINAL MODE: The UWC Control provides two methods for programming a weld schedule. The first method is to use a PC and the RS-232 serial port to program the schedules off-line. Refer to Section 7.0 for additional information on serial off-line programming.

> ***NOTE:*** *Removing power to the UWC while in the PROGRAM MODE may cause errors in the UWC Weld Schedule Parameters. Place the Front Panel Key-Lock Switch in the RUN position before powering the UWC OFF.*

UWC FRONT PANEL: To create, modify or load a schedule set the front panel key-lock switch to the *"PROGRAM"* position. The UWC will display the "*WELD PARAMETER*" menu option. Select this menu by pressing the "SEL" button. To change the Control configuration parameters press the "INC" or "DEC" button. The UWC will display the "*CONFIG PARAMETER*" menu option. To select a specific menu option, press the "SEL" button. After selecting a menu option the UWC will display the menu items and their current values on the display. To move forward through the menu items press the "*INC*" button. To move back to the previous menu item, press the "*DEC*" button. When moving through the menu items the UWC will display the current value for each of the items selected. To change any selected item press the "*SELECT*" button. A Blinking cursor will be displayed. To increase the displayed value, press the "*INC*" button. To decrease the value, press the "*DEC*" button. To exit the edit routine press the "*SELECT*" button. The Blinking cursor will be cleared from the display. Move to the next item by pressing the "*INC*" or "*DEC*" buttons. To exit the schedule edit routine turn the key-lock switch to the "RUN" position. If a value has been modified, by pressing the "*SELECT*" button, the display will show a "SAVING SCHEDULE" prompt indicating that the changes have been saved to the UWC nonvolatile Memory. The UWC Display will then return to the normal Static display messages.

6.4 Weld Schedule Parameter Menus

The UWC controller can support several different options. Depending on which options are installed three different menus will be displayed. Each menu is specific to the available functions and features that are installed. Placing the UWC key-lock switch to the "**PGM**" position enables the edit function. One of the following Program menus will be displayed.

6.5 PAW Weld Schedule Menu Screens

DISPLAY	PARAMETER DESCRIPTION	RANGE	UNITS
START CURRENT AMP =	Weld cycle start current level.	1 – 500	Amps
START DELAY TIME =	The time period at the Start current level.	0 – 60.00	Sec.
START TRAVEL SPEED SPEED=	The travel speed that is used during the start time portion of the weld	0.0 -100.0	ipm
RAMP UP TIME TIME =	The time that will be used to ramp the welding current from the start to the run value.	0 – 60.00	Sec.
RUN TIME CURRENT AMP =	The current level that will be used during the run time portion of the weld cycle.	1- 500	Amps
RUN TRAVEL SPEED SPEED=	The travel speed that is used during the run time portion of the weld	0.0 -100.0	ipm
SPOT WELD TIME TIME =	The time period at the run current. If set the weld sequence will automatically terminate at the end of this time. If zero the user must clear the Cycle start signal to terminate the weld cycle.	0 – 650.00	Sec.
PERCENT TAPER TAPER % =	The percent of run current that will be reached at the end of the taper event.	1 – 100	%
TAPER DELAY TIME TIME =	The time period to perform the current taper event.	0 – 600.00	Sec.
RAMP DOWN TIME TIME =	The time period used to ramp the current from the Taper % level to the end current level.	0 – 60.00	Sec.
END CURRENT AMPS =	The current level that will be used during the end time period.	1 - 500	Amps
END TRAVEL SPEED SPEED=	The travel speed that is used during the end time portion of the weld	0.0 -100.0	ipm
END DELAY TIME TIME =	The time period at the end current level.	0 – 60.00	Sec.
JOG TRAVEL SPEED SPEED =	The Travel speed that is used while not welding.	0 – 1000	Ipm
PULSE MODE MODE =	Enable/Disable the pulse weld mode. If enabled the pulse mode will be active from the start of the ramp up event to the end of the ramp down event.	0 – 1	Yes/No
PULSE FREQUENCY =	The Pulse Frequency in Hz when the pulse mode is active.	0.6 –500.0	Hz
PULSE ON PERCENT =	The Pulse ON Percent when the pulse mode is active.	10 - 90	%
% BACKGROUND AMP AMP % =	The percent of the peak current value that is used for the background current level.	1-100	%
SELECT SCHEDULE SCHED =	Select the user defined weld schedule and read the schedule from weld memory into the active weld schedule parameters.	1 – 32	
SAVE SCHEDULE SCHED =	Write the current active weld schedule to the specified schedule number in the weld memory.	1 - 32	

Table 3 - Weld Schedule Menu for PAW Welding Mode

6.6 PAW with Cold Wire Feed Option Weld Schedule Menu Screens

DISPLAY	PARAMETER DESCRIPTION	RANGE	UNITS
START CURRENT AMP =	Weld cycle start current level.	1 - 500	Amps
START WIRE SPEED SPEED =	The wire feed speed to be used during the start time period. To disable set the speed to 0.	0-1000	Ipm
START TRAVEL SPEED SPEED=	The travel speed that is used during the start time portion of the weld	0.0 -100.0	ipm
START DELAY TIME =	The time period at the Start current level.	0 – 60.00	Sec.
RAMP UP TIME TIME =	The time that will be used to ramp the welding current from the start to the run value.	0 – 60.00	Sec.
RUN TIME CURRENT AMP =	The current level that will be used during the run time portion of the weld cycle.	1- 500	Amps
RUN TRAVEL SPEED SPEED=	The travel speed that is used during the run time portion of the weld	0.0 -100.0	ipm
RUN WIRE SPEED SPEED =	The wire feed speed to be used during the Run time period. To disable set the speed to 0.	0-1000	Ipm
SPOT WELD TIME TIME =	The time period at the run current. If set the weld sequence will automatically terminate at the end of this time. If zero the user must clear the Cycle start signal to terminate the weld cycle.	0 – 650.00	Sec.
PERCENT TAPER TAPER % =	The percent of run current that will be reached at the end of the taper event.	1 – 100	%
TAPER DELAY TIME TIME =	The time period to perform the current taper event.	0 – 600.00	Sec.
RAMP DOWN TIME TIME =	The time period used to ramp the current from the Taper % level to the end current level.	0 – 60.00	Sec.
END CURRENT AMPS =	The current level that will be used during the end time period.	1 - 500	Amps
END WIRE SPEED SPEED =	The wire feed speed to be used during the end time period. To disable set the speed to 0.	0-1000	Ipm
END TRAVEL SPEED SPEED=	The travel speed that is used during the end time portion of the weld	0.0 -100.0	ipm
END DELAY TIME TIME =	The time period at the end current level.	0 – 60.00	Sec.
REV WIRE DELAY TIME =	The time period to reverse the wire feeder and back the wire out of the arc. The Wire speed is the end wire value.	0 - 60.00	Sec.
PULSE MODE MODE =	Enable/Disable the pulse weld mode. If enabled the pulse mode will be active from the start of the ramp up event to the end of the ramp down event.	0 – 1	Yes/No
PULSE FREQUENCY =	The Pulse Frequency in Hz when the pulse mode is active.	0.6 –500.0	Hz
PULSE ON PERCENT =	The Pulse ON Percent when the pulse mode is active.	10 - 90	%
JOG WIRE SPEED SPEED =	The wire drive speed that is used while not welding.	0 – 1000	Ipm
JOG TRAVEL SPEED SPEED =	The Travel speed that is used while not welding.	0 – 1000	Ipm
% BACKGROUND AMP AMP % =	The percent of the peak current value that is used for the background current level.	1-100	%
SELECT SCHEDULE SCHED =	Select the user defined weld schedule and read the schedule from weld memory into the active weld schedule parameters.	1 – 32	
SAVE SCHEDULE SCHED =	Write the current active weld schedule to the specified schedule number in the weld memory.	1 - 32	

Table 4 - Weld Schedule Menu for PAW with Cold Wire Feed option enabled

6.7 GMAW Option Weld Schedule Menu Screens

DISPLAY	PARAMETER DESCRIPTION	RANGE	UNITS
PREPURGE TIME TIME =	Pre purge gas flow time period.	0 - 60.00	Sec.
START VOLTAGE VOLTS =	Weld cycle start voltage level.	10.0- 50.0	Volts
START WIRE SPEED SPEED =	The wire feed speed to be used during the start time period.	0-1000	Ipm
START TRAVEL SPEED SPEED=	The travel speed that is used during the start time portion of the weld	0.0 -100.0	ipm
START DELAY TIME =	The time period at the Start level.	0 – 60.00	Sec.
RAMP UP TIME TIME =	The time that will be used to ramp the parameters from the start to the run value.	0 – 60.00	Sec.
RUN TIME VOLTAGE AMP =	The voltage level that will be used during the run time portion of the weld cycle.	10.0- 50.0	Volts
RUN WIRE SPEED SPEED =	The wire feed speed to be used during the Run time period.	0-1000	Ipm
RUN TRAVEL SPEED SPEED=	The travel speed that is used during the run time portion of the weld	0.0 -100.0	ipm
SPOT WELD TIME TIME =	The time period at the run level. If set the weld sequence will automatically terminate at the end of this time. If zero the user must clear the Cycle start signal to terminate the weld cycle.	0 – 650.00	Sec.
PERCENT TAPER TAPER % =	The percent of run wire speed that will be reached at the end of the taper event.	1 – 100	%
TAPER DELAY TIME TIME =	The time period to perform the taper event.	0 – 600.00	Sec.
RAMP DOWN TIME TIME =	The time period used to ramp from the Taper % level to the end level.	0 – 60.00	Sec.
END VOLTAGE VOLTS =	The voltage level that will be used during the end time period.	10.0– 50.0	Volts
END WIRE SPEED SPEED =	The wire feed speed to be used during the end time period.	0-1000	Ipm
END TRAVEL SPEED SPEED=	The travel speed that is used during the end time portion of the weld	0.0 -100.0	ipm
END DELAY TIME TIME =	The time period at the end level.	0 – 60.00	Sec.
REV WIRE DELAY TIME =	The time period to reverse the wire feeder and back the wire out of the arc. The Wire speed is the end wire value.	0 - 60.00	Sec.
BURN BACK TIME TIME =	The time period, which will be used to hold the weld contactor on after halting the wire feed motor.	.01 - 6.00	Sec.
POST PURGE TIME TIME =	The Post Gas flow time period.	.01-60.00	Sec.
JOG WIRE SPEED SPEED =	The wire drive speed that is used while not welding.	0 – 1000	Ipm
JOG TRAVEL SPEED SPEED =	The Travel speed that is used while not welding.	0 – 1000	Ipm
SELECT SCHEDULE SCHED =	Select the user defined weld schedule and read the schedule from weld memory into the active weld schedule parameters.	1 – 32	
SAVE SCHEDULE SCHED =	Write the current active weld schedule to the specified schedule number in the weld memory.	1 - 32	

Table 5 - Weld Schedule Menu for GMAW option enabled

6.8 Setup Parameter Menus

The UWC controller can support several different options. The setup Parameter menu allows the user to configure various setup control parameters and options. Depending on which options are enabled different Weld parameter menus will be displayed. The user can also specify the current range for a power supply and enable remote I/O weld schedule selections.

6.9 Setup GTAW/PAW Mode Parameter Menu Screens

DISPLAY	PARAMETER DESCRIPTION	RANGE	UNITS
REMOTE SCHEDULE SELECT =	Enable remote weld schedule option. When "ON" the user supplied I/O SCHED 0 - 4 inputs (TB5-6- TB5-10) will specify the desired weld schedule. Refer to Section 4.5 for additional information	ON/OFF	
GTAW CONTROL MODE =	Enables the GTAW process mode and weld parameter menus	ON/OFF	
GMAW CONTROL MODE =	Enables the UWC control for the GMAW (MIG/MAG) process mode and weld parameter menu	ON/OFF	
WIRE DRIVE MOTOR ENABLED =	Enable Wire Feed drive motor control and menu parameters	ON/OFF	
LOW AMP RANGE MODE =	Allows the UWC to display 0.1 amp increments for low current GTAW/PAW power sources. Setting this mode Forces a 0.1 amp resolution for current values	ON/OFF	
CURRENT DAC GAIN DAC GAIN	The Gain valued used to scale the UWC analog output. GAIN = 4000 /(AMP_{max} – AMP_{min})	1- 255	
MIN CURRENT AMP =	The Minimum current level that the power source can provide. This value is used to scale the UWC analog output.	1- 255 0.1 – 25.0	Amps
WIRE DAC GAIN DAC GAIN =	This Gain value is used to scale the UWC analog output. GAIN= 4000/($WIRE_{max}$ - $WIRE_{min}$)	1- 255	
MIN WIRE SPEED IPM =	The Minimum wire speed that the wire feed drive motor can provide. This value is used to scale the UWC analog output.	0- 255	IPM
TRAVEL DAC GAIN DAC GAIN=	This Gain value is used to scale the UWC analog output. GAIN= 400/($Travel_{max}$ – $Travel_{min}$)	1-255	
MIN TRAVEL SPEED IPM=	The minimum Travel speed that the Travel drive motor can provide	0-255	
ARC ACTIVE AMPS	The Minimum AMP Level for valid ARC Current	0-255	
ARC ACTIVE VOLTS	The Minimum VOLT Level for valid ARC Voltage	.0-25.5	

Table 6- Setup Parameter menu functions

6.10 Setup GMAW Mode Parameter Menu Screens

DISPLAY	PARAMETER DESCRIPTION	RANGE	UNITS
REMOTE SCHEDULE SELECT =	Enable remote weld schedule option. When "ON" the user supplied I/O SCHED 0 - 4 inputs (TB5-6- TB5-10) will specify the desired weld schedule. Refer to Section 4.5 for additional information	ON/OFF	
GTAW CONTROL MODE =	Enables the GTAW process mode and weld parameter menus	ON/OFF	
GMAW CONTROL MODE =	Enables the UWC control for the GMAW (MIG/MAG) process mode and weld parameter menu	ON/OFF	
VOLTAGE DAC GAIN DAC GAIN	The Gain valued used to scale the UWC analog output. GAIN = 400 /($VOLT_{max}$ – $VOLT_{min}$)	1- 255	
MIN VOLTAGE VOLT =	The Minimum current level that the power source can provide. This value is used to scale the UWC analog output.	1- 25.5	Volts
WIRE DAC GAIN DAC GAIN =	This Gain value is used to scale the UWC analog output. GAIN= 4000/($WIRE_{max}$ - $WIRE_{min}$)	1- 255	
MIN WIRE SPEED IPM =	The Minimum wire speed that the wire feed drive motor can provide. This value is used to scale the UWC analog output.	1- 100	IPM
TRAVEL DAC GAIN DAC GAIN=	This Gain value is used to scale the UWC analog output. GAIN= 400/($Travel_{max}$ – $Travel_{min}$)	1-255	
MIN TRAVEL SPEED IPM=	The minimum Travel speed that the Travel drive motor can provide	0-255	
ARC ACTIVE AMPS	The Minimum AMP Level for valid ARC Current	0-255	
ARC ACTIVE VOLTS	The Minimum VOLT Level for valid ARC Voltage	.0-25.5	

Table7- Setup Parameter menu functions

7.0 UWC OFF-LINE RS-232 TERMINAL PROTOCOL

7.1 General Description

The RS-232 Terminal mode can be used to off-line program the user configurable parameters and operating modes. The protocol is a simple ASCII command string that allows the user to upload or download the various data. The user can use any terminal program to perform the programming function. All program command functions are case sensitive. The serial port is configured for the following data format:

- Baud Rate: 19.2K, Full Duplex
- Word Length: 8 Data Bits, One Stop and no parity
- Hand Shaking: None

7.2 Terminal Protocol

The protocol consists of a command string and optional data bytes. The command string is an alpha character and an option number followed by a "=" or "?", followed by optional data and terminated with a ASCII "cr" (0dh). The "=" will indicate that data is being sent to the selected parameter by the host controller. The "?" will indicate a request for data from the UWC to the host controller. If the host is sending data to the UWC the data will be placed after the "=" character and will be an ASCII string terminated with an ASCII "cr" (0dh). The following is an example of reading a parameter value from the UWC:

From Host type: **V1? (cr)**
Response from UWC: **##**

Where: ## is the current value for the parameter and (cr) is the enter key

The following is an example of how to modify a value in the UWC using the terminal commands:

From Host type: **V1=#### (cr)**

Where: ## is the new value for the parameter and (cr) is the enter key

7.3 Terminal Commands

The following is a summary of the Terminal Commands supported by the UWC:

COMMAND	PARAMETER DESCRIPTION	RANGE	UNITS
V1	Prepurge time	0-650.00	. 01 Sec.
V2	Arc start current	0-500	Amps
V3	Arc Start Wire feed speed	0-650	IPM
V4	Arc Start delay time	0-650.00	.01 Sec.
V5	Ramp up Delay time	0-650.00	.01 Sec
V6	Run time current (Pulse Peak current)	0-650.00	Amps
V7	Run Time wire feed speed	0-650	IPM
V8	Spot Weld Time (If Time=0 then Manual control)	0-650.00	.01 Sec.
V9	Percent Taper current	0-100	%
V10	Taper current delay time	0-650.00	.01 Sec.
V11	Ramp down delay time	0-650.00	.01 Sec.
V12	End current value	0-500	Amps
V13	End wire feed speed	0-650	IPM
V14	End delay time	0-650.00	.01 Sec.
V15	Reverse wire speed time delay	0-650.00	Sec.
V16	Wire burn back delay time	0-650.00	.01 Sec.
V17	Post gas flow time delay	0-650.00	.01 Sec.
V18	Pulse Frequency	0.6 - 90	Hz
V19	Pulse Percent ON	10 - 90	%
V20	Percent back ground current	0-100	%
V21	Jog wire feed speed	0-650	IPM
V22	Percent back ground wire feed speed	0-100	%
V23	Start Time Travel Speed	0-100	IPM
V24	Run Time Travel Speed	0-100	IPM
V25	End Time Travel Speed	0-100	IPM
V26	Jog Travel Speed	0-100	IPM
V27	Percent background travel speed	0-100	%

Table 7 - Weld Process and Command Table

COMMAND	PARAMETER DESCRIPTION	RANGE
M1	Read Remote Inputs LSB byte BIT 0 – Schedule Bit 0 input TB5-6 BIT 1 – Schedule Bit 1 input TB5-7 BIT 2 – Schedule Bit 2 input TB5-8 BIT 3 – System Ready Input BIT 4 – Travel Forward Input limit BIT 5 – Travel Reverse Limit Input BIT 6 – Torch Up/Down Input BIT 7 – ESTOP switch Input	0-255
M2	Read/Write Remote Relay Outputs (LSB) CR1-CR7 BIT 0 – CR0 Spare 1 BIT 1 – CR1 Spare 2 BIT 2 – CR2 Torch Down Output BIT 3 – CR3 Weld Cycle Fault BIT 4 – CR4 Cycle Complete Output BIT 5 – CR5 Arc Active Output BIT 6 – CR6 Ready Output BIT 7 – CR7 Cycle On LED	0-255
M3	Read Remote Input MSB byte BIT 0 – PTA:0 – Auto/Man Switch input BIT 1 – PTA:1 – Cycle On/Off switch input BIT 2 – PTA:2 – Jog Wire Forward Switch Input BIT 3 – PTA:3 – Spare BIT 4 – PTA:4 – Spare BIT 5 – PTB:6 – Travel Jog Forward Switch Input BIT 6 – PTB:7 – Travel Jog Reverse Switch Input BIT 7 – PTD:4 - Jog Wire Reverse Switch Input	0-255
M4	Read/Write Relay Outputs MSB BIT 0 – PTB:0 – Weld Contactor Output BIT 1 – PTB:1 – Gas Solenoid Output BIT 2 – PTB:2 – Wire Forward Output BIT 3 – PTB:3 - Wire Reverse Output BIT 4 – PTB:4 - Travel Forward Output BIT 5 – PTB:5 – Travel Reverse Output BIT 6 – PTA:5 - Spare Output BIT 7 – PTA:6 - Spare Output	0-255
M5	Read/Write Remote Inputs MSB byte BIT 0 – Schedule Select Function BIT 1 – Enable Wire Feed control functions BIT 2 – Enable GMAW weld mode functions BIT 3 – Enable GTAW weld mode functions	0-15
M6	Terminal Baud Rate control 0 = 76.8K Baud 1 = 38.4K Baud 2 = 19.2K Baud (Default) 3 = 9600 Baud 4 = 4800 Baud 5 = 2400 Baud 6 = 1200 Baud	0-6
M7	Weld Control Error Code 0 - No Error 1 - Weld Sequence Program Fault 2 - Power Supply Not Ready Fault 3 - ARC fail during weld cycle 4 - Schedule Fault – Invalid Parameter Data 5 - ESTOP active	1-5
M8	Reset Weld Memory and reload default values. To clear all memory and restore default set M8=251 then power cycle the control	0 or 251

Table 8 - System Configuration and Mode command table

COMMAND	PARAMETER DESCRIPTION	RANGE
W1	Weld Schedule Mode Flag: Bit 0 – Enable Pulse Weld Mode Bit 1..7 – Not defined	0-255
W2	Active Weld Schedule number	1-32
W3	Active Weld Event number 0 - Cycle Off 1 - Cycle Start 2 - Pre Purge 3 - Start Time 4 - Ramp Up Time 5 - Run Time (Spot Weld Time if enabled) 6 - Taper Current time 7 - Ramp Down Time 8 - End Time 9 - Wire Reverse Time 10 - Burn Back Time 11 - Post Purge Time	0-11
W4	Write current schedule to specified weld schedule number	1-32
W5	Read specified weld schedule from memory to active schedule	1-32

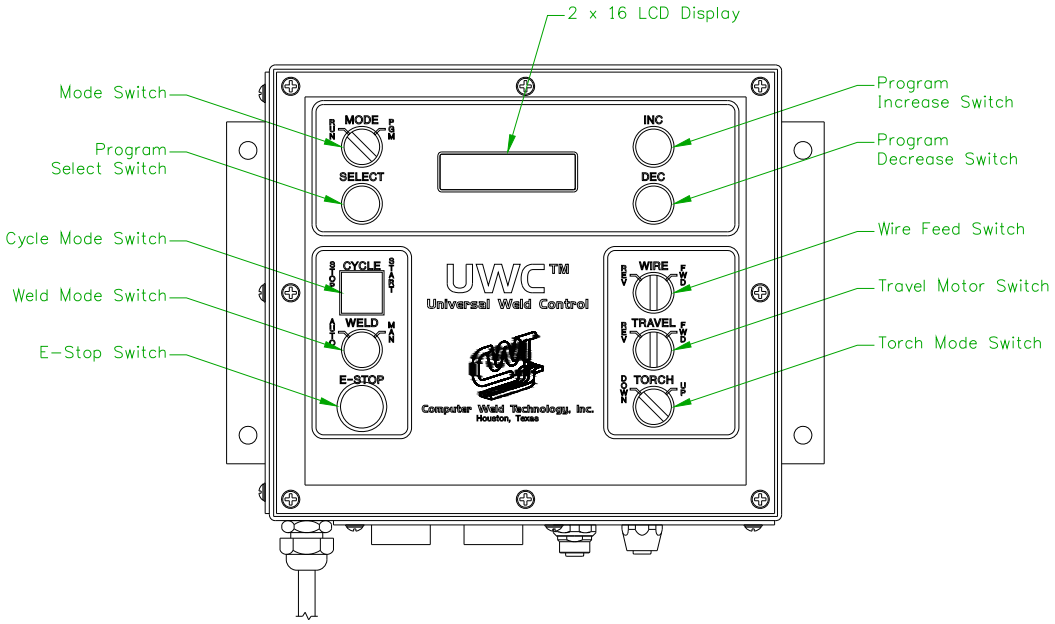
Table 9 - Weld Mode Command Table

COMMAND	PARAMETER DESCRIPTION	RANGE
C1	Power supply Volt/Amp output (C1 = V/A Gain) used for DAC 1 scaling. Where: (DAC 1 Amp Gain C1 = [4000/(AMPmax – AMP_{min})]) or DAC 1 Volt Gain C1 = [400/($Volt_{max}$ – $Volt_{min}$)]	0-255
C2	Minimum Power supply Volt/Amp (A2=V/A_{MIN}) used for DAC 1 scaling	0-255
C3	Wire Feed speed Gain (C3 = Wire Speed Gain) used for DAC 2 scaling. Where: (DAC 2 Wire Gain C3 = [4000/(WFSmax – WFS_{min})]	0-255
C4	Minimum Wire Feed Speed (C5=$WIRE_{min}$) used for DAC 2 scaling	0-255
C5	Travel speed Gain (C5 = Travel Speed Gain) used for DAC 3 scaling. Where: (DAC 3 Travel Gain C5 = [400/(TVSmax – TVS_{min})]	0-25.5
C6	Minimum Travel Speed (C6=$WIRE_{min}$) used for DAC 3 scaling	0-25.0

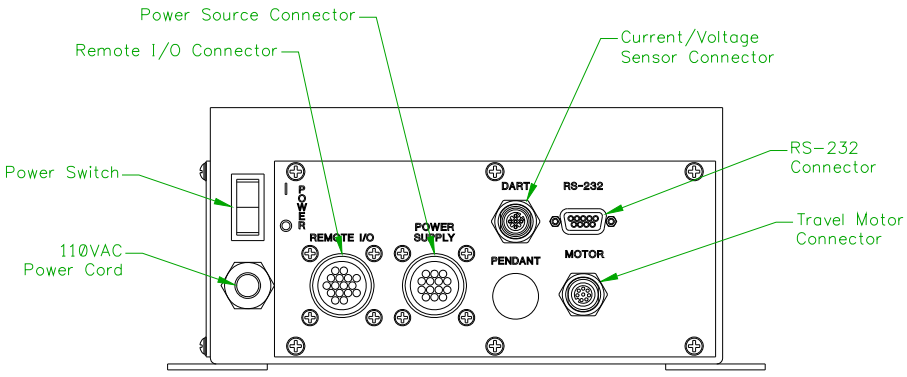
Table 10 - Analog Scaling Command Table

8.0 ENCLOSURE LAYOUTS

8.1 Universal Weld Control Enclosure Panel Layouts



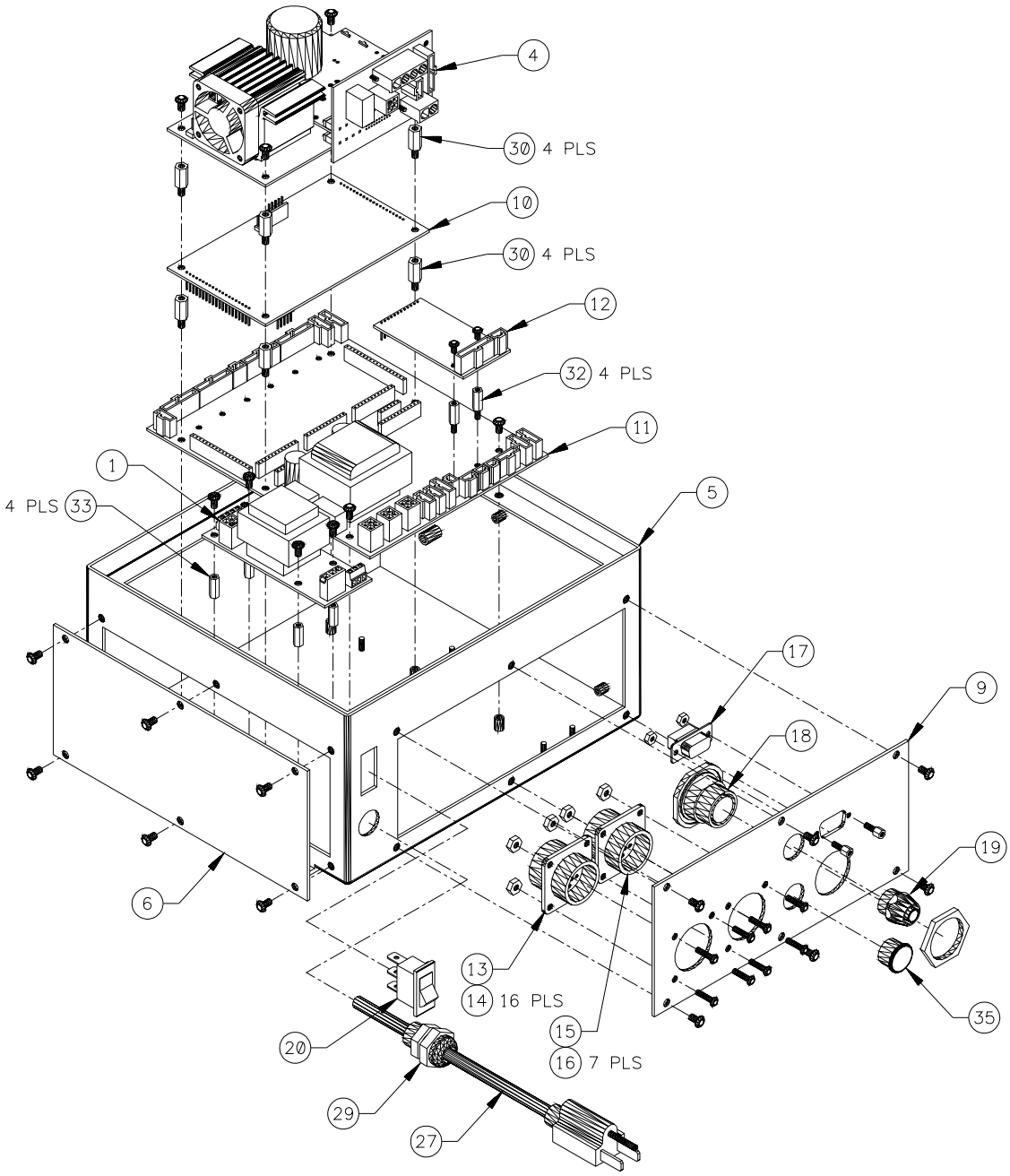
FRONT PANEL VIEW

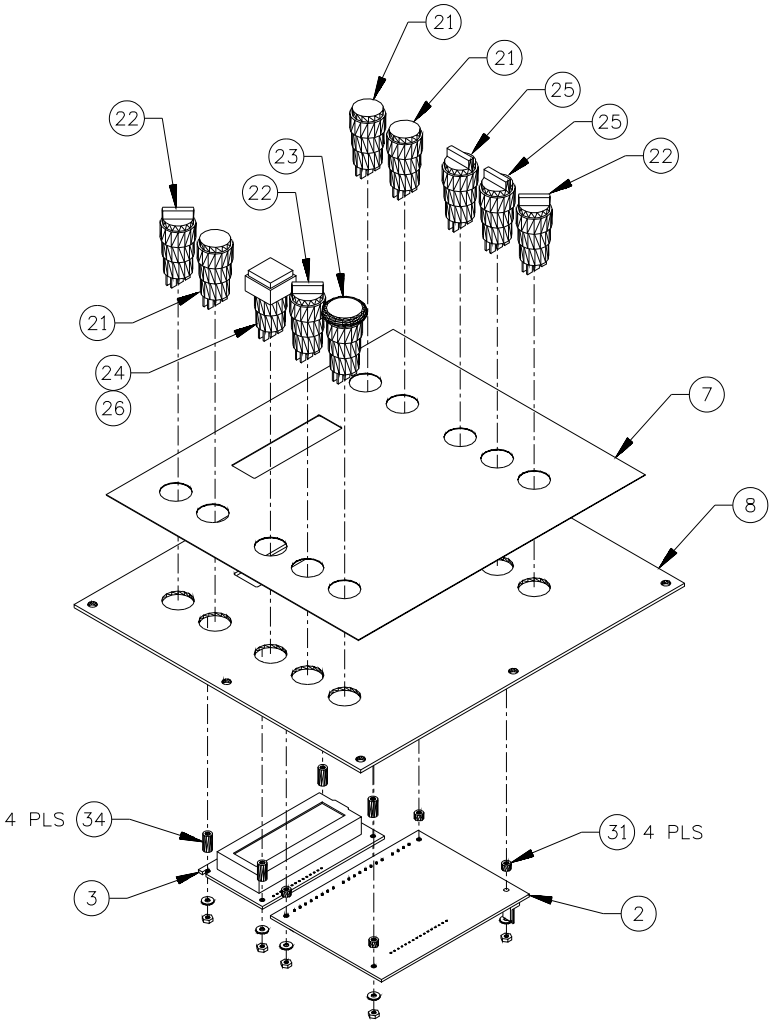


BOTTOM VIEW

8.2 Universal Weld Control Enclosure Parts List

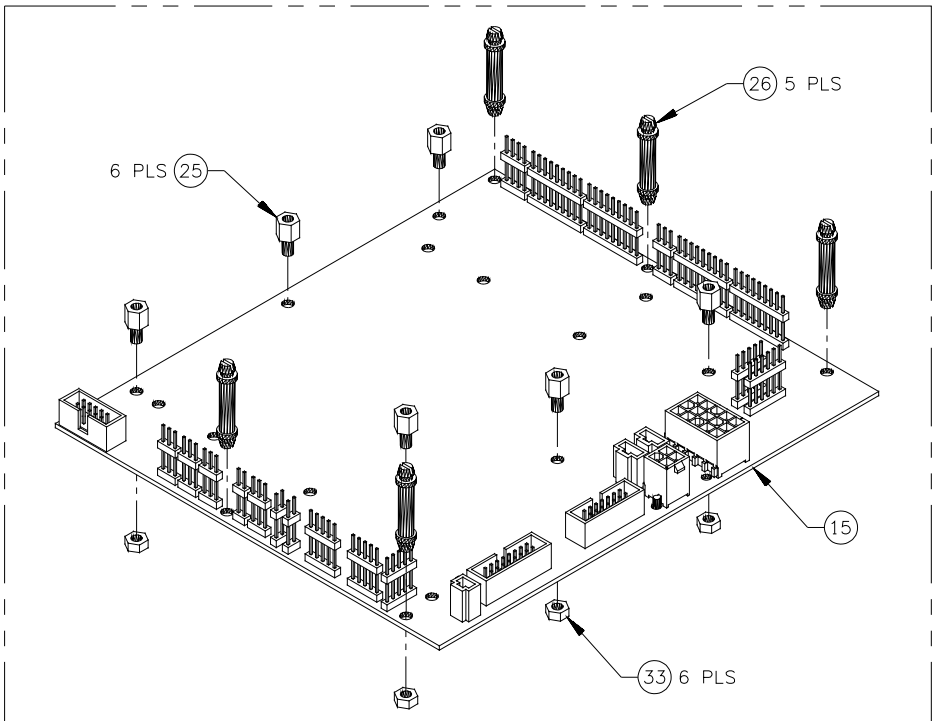
Part List for UWC Enclosure – P/N: S3A5138





Front Cover Panel

ITEM	QTY	CWT P/N	DESCRIPTION
1	1	A5A0130	PCB ASSY, 12/24 VDC ISOLATED POWER SUPPLY
2	1	C5A5004-UWC	PCB ASSY, UNIVERSAL PENDANT - UWC
3	1	S3A5108	DISPLAY, WSC-2 2X16 LCD
4	1	S3A5130-NA5	CONTROL ASSY, PWM-2 150VDC DRIVER -NA5
5	1	S3E5078	ENCLOSURE, 9" X 8" X 4-1/2"
6	1	S3E5081	COVER, LARGE BLANK
7	1	S3E5102	OVERLAY, UWC FRONT
8	1	S3E5103	COVER, UWC FRONT
9	1	S3E5104	COVER, UWC BOTTOM
10	1	S5A5033-UWC	PCB ASSY, MC6808GP32 - UWC
11	1	S5A5048	PCB ASSY, WELD I/O
12	1	S5A5057	PCB ASSY, TRAVEL I/O MODULE
13	1	X3P0290	CONN., RCPT HOUSING 16 PIN CPC
14	16	X3P0301	PIN, 20-24 GAUGE CRIMP
15	1	X3P5792	CONN, RCPT HOUSING 14 PIN CPC
16	7	X3P0303	SOCKET, 20-24 GAUGE CRIMP
17	1	X3P5484	CONN., 9 CIRCUIT FEMALE D-SUB
18	1	X3P5582	CONN, PT07A-14-12S
19	1	X3P5804	CONN, RCPT 5 CIRCUIT FEMALE
20	1	X3S5078	SWITCH, ROCKER 110VDC
21	3	X3S5125	SWITCH, PUSHBUTTON BLACK SPDT
22	3	X3S5126	SWITCH, SELECTOR 2 POSITION SPDT
23	1	X3S5128	SWITCH, PUSHLOCK SPDT
24	1	X3S5130	SWITCH, PUSHBUTTON GREEN 24VDC LED
25	2	X3S5148	SWITCH, SELECTOR 3 POSITION M-C-M SPDT
26	1	X3S5152	GUARD, SWITCH
27	1	X3W5022	CORD, POWER 18 AWG 6'-7"
28	1	X3Z5027	SCREWLOCK KIT, STD FEMALE
29	1	X3Z5106	RELIEF, STRAIN 0.18"-0.30"
30	8	X6S5023	SPACER, #6-32 X 1/2" LONG M-F SS
31	4	X6S5052	SPACER, #2 X 1/8" LONG NYLON
32	2	X6S5053	SPACER, #4-40 X 1/2" LONG M-F SS
33	4	X6S5054	SPACER, #4-40 X 1/2" LONG SS
34	4	X6S5063	SPACER, #2 X 3/8" LONG NYLON
35	1	X6Z5042	PLUG, HOLE #5/8" BLACK



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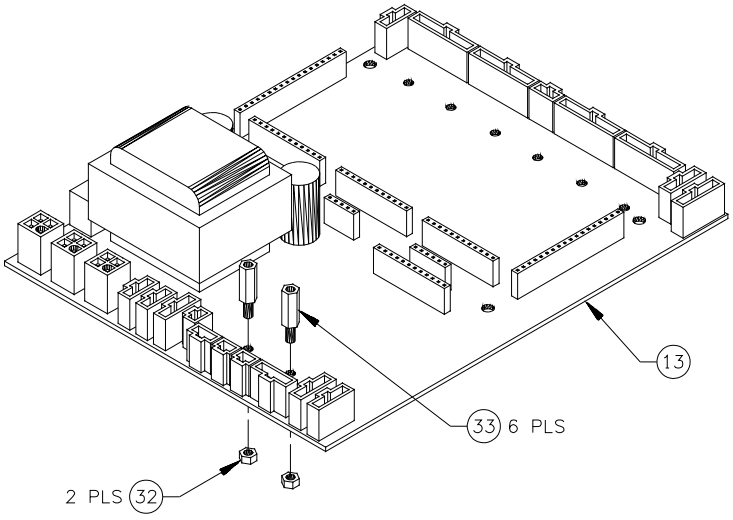

NOTE: INSTALL JUMPERS ON HEADER "JMP1" AT LOCATIONS "A" & "B" FOR 110VAC CONFIGURATION.

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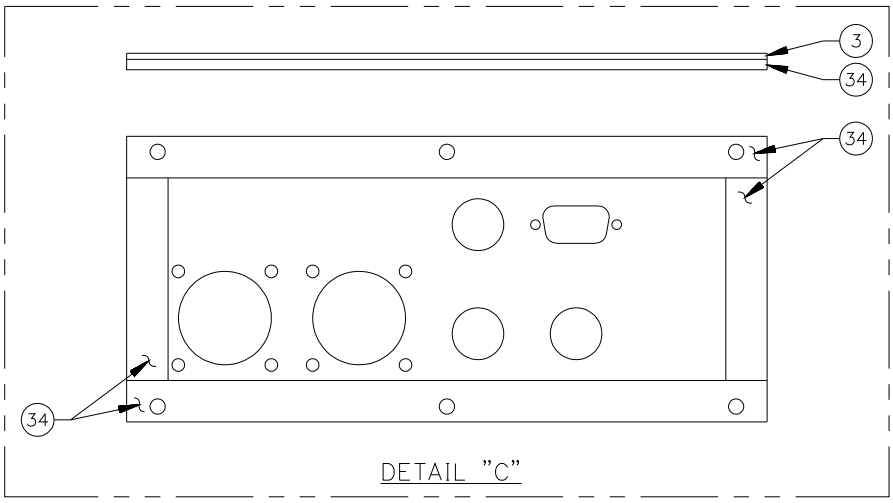

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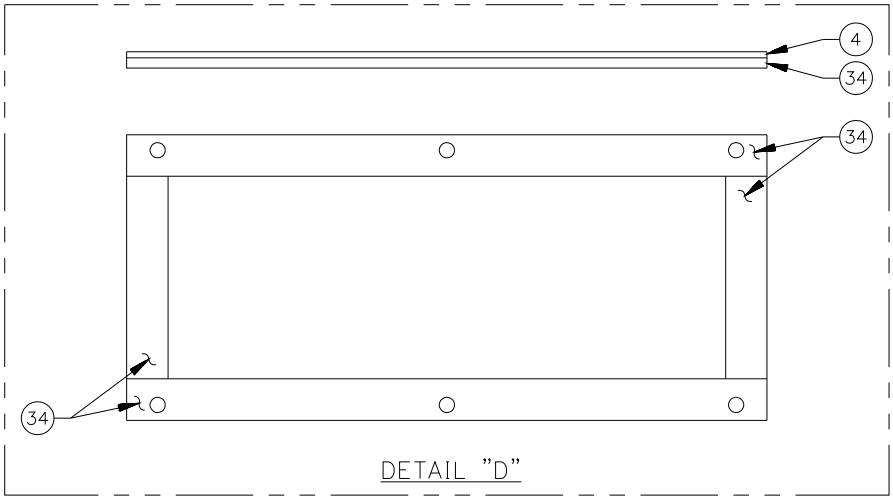

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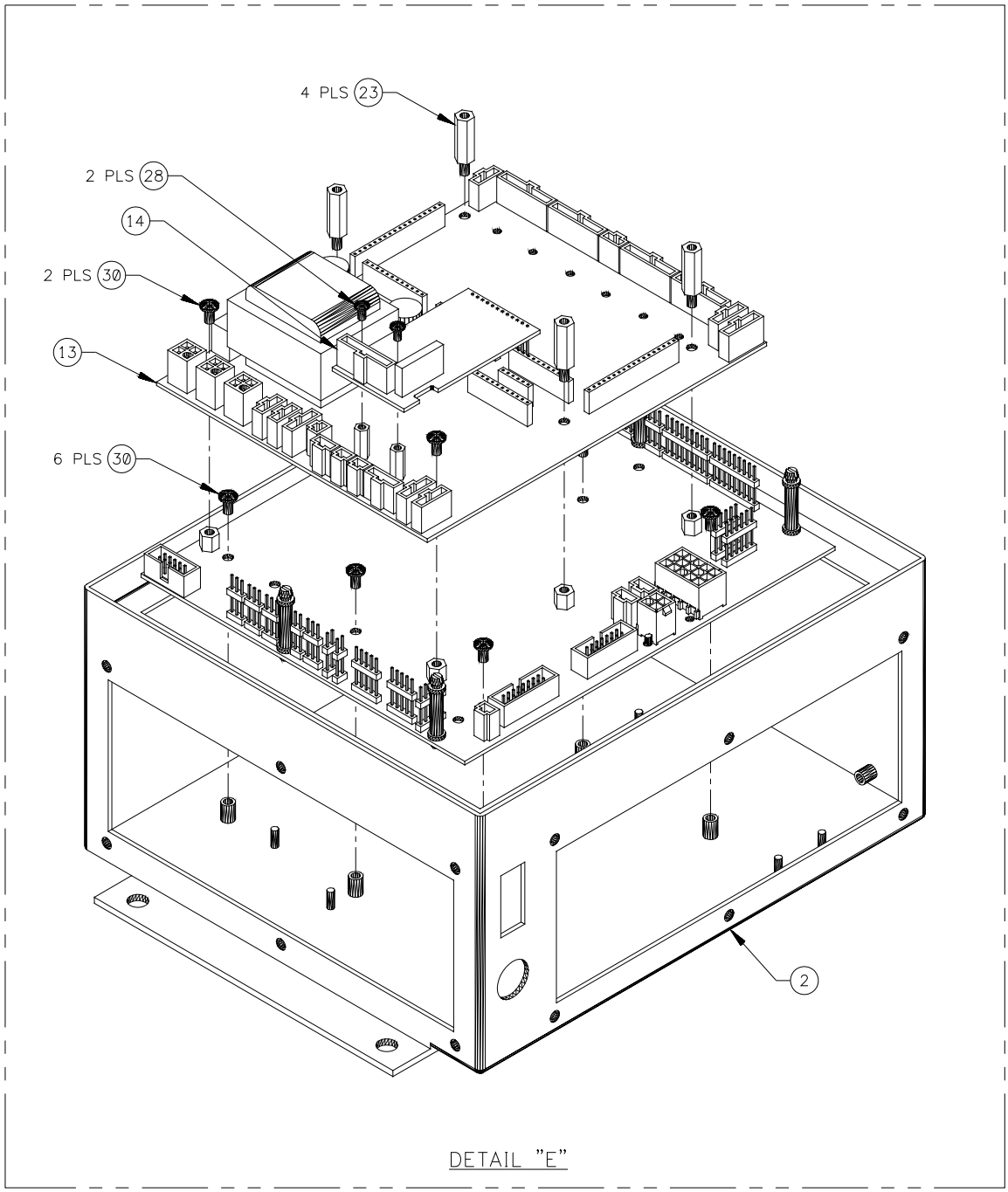

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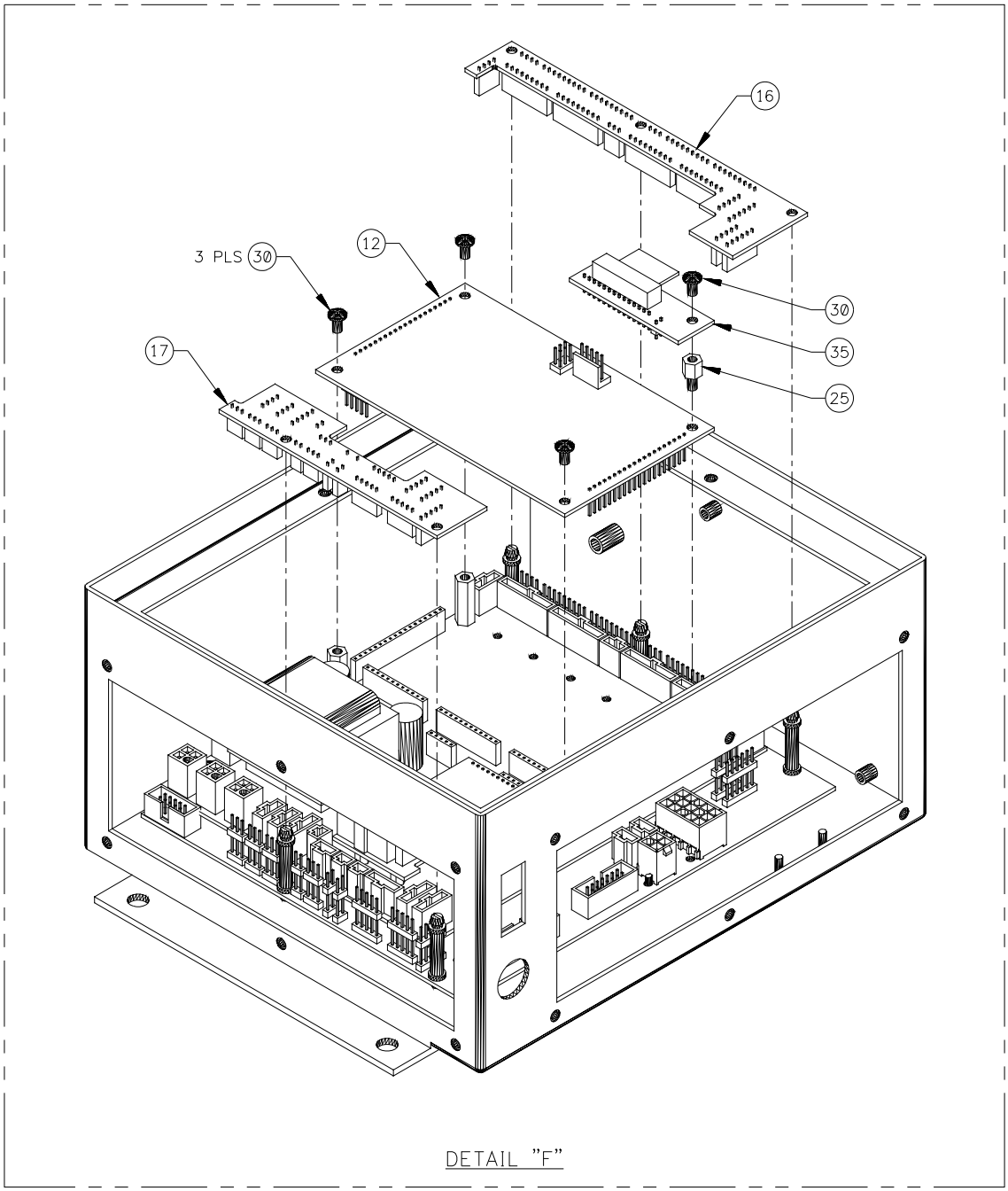

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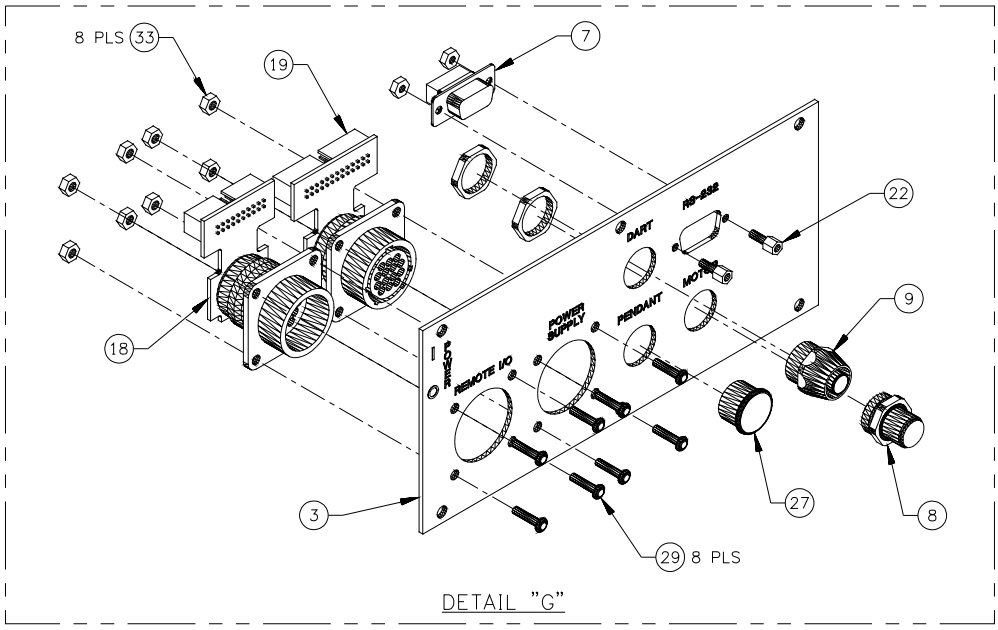

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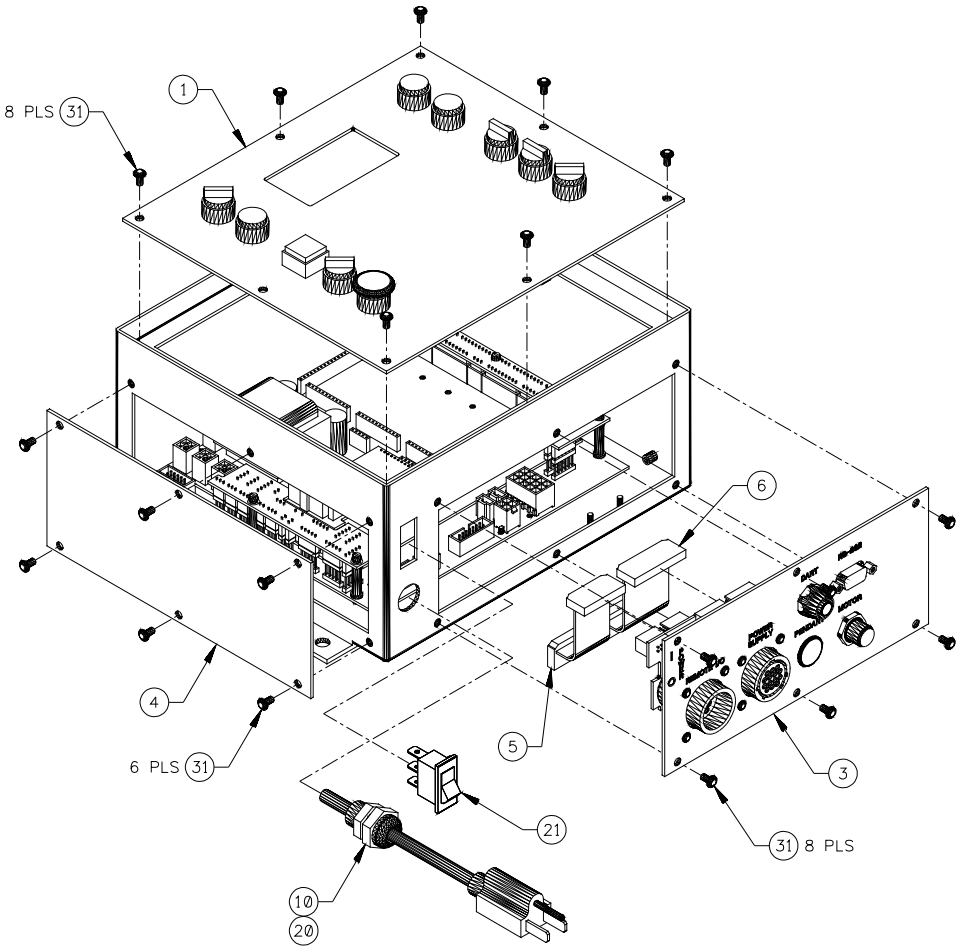
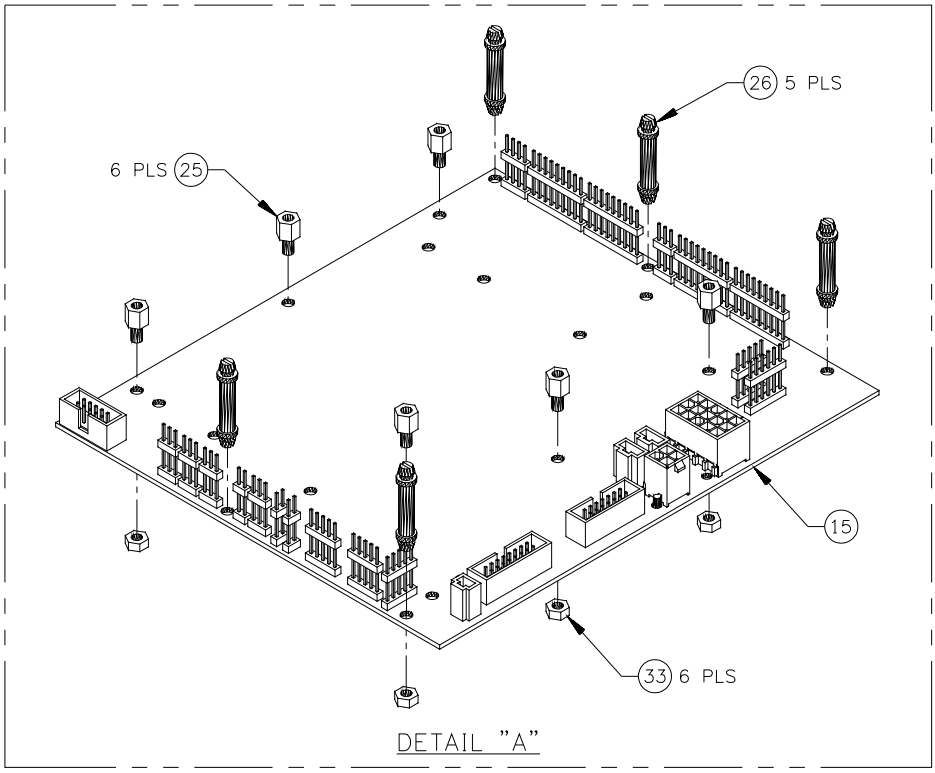


DETAIL "H"
SCALE: 1/3

ITEM	QTY	CWT P/N	DESCRIPTION
1	1	S3A5181	COVERT ASSY, UWC FRONT
2	1	S3E5078	ENCLOSURE, 9" X 8" X 4-1/2"
3	1	S3E5180	COVER, WSC BOTTOM
4	1	S3E5081	COVER, LARGE BLANK
5	1	S3W5179	CABLE, UWC REMOTE I/O
6	1	S3W5180	CABLE, UWC POWER SOURCE
7	1	S3W5181	CABLE, UWC RS-232
8	1	S3W5182	HARNESS, UWC TRAVEL
9	1	S3W5183	HARNESS, UWC SENSOR
10	1	S3W5184	HARNESS, UWC POWER SWITCH
11	1	S3W5185	CABLE, 110VAC POWER
12	1	S5A5033-UWC	PCB ASSY, MC6808GP32 - UWC
13	1	S5A5048	PCB ASSY, WELD I/O
14	1	S5A5049	PCB ASSY, I/O MODULE
15	1	S5A5071	PCB ASSY, UWC TERMINAL
16	1	S5A5072	PCB ASSY, UWC RIGHT CONNECTOR
17	1	S5A5073	PCB ASSY, UWC LEFT CONNECTOR
18	1	S5A5074	PCB ASSY, UWC REMOTE I/O CONNECTOR
19	1	S5A5075	PCB ASSY, UWC POWER SOURCE CONNECTOR
20	1	X3P5706	CONN, PLUG 4 CIRCUIT
21	1	X3S5078	SWITCH, ROCKER 110VDC
22	1	X3Z5027	SCREWLOCK KIT, STD FEMALE
23	4	X6S5023	SPACER, 6-32 X 1/2 M-F
24	2	X6S5053	SPACER, 4-40 X 1/2 M-F
25	7	X6S5057	SPACER, 6-32 X 1/4 M-F
26	5	X6S5070	SPACER, PCB 7/8” NYLON
27	1	X6Z5042	PLUG, HOLE #5/8" BLACK
28	2		SCREW, 4-40 X 1/4 PAN HEAD W/ INT LOCK WASHER
29	8		SCREW, 6-32 X 3/8 PAN HED
30	12		SCREW, 6-32 X 1/4 PAN HEAD W/ INT LOCK WASHER
31	20		SCREW, 6-32 X 3/8 PAN HEAD W/ INT LOCK WASHER
32	2		NUT, 4-40 JAM
33	14		NUT, 6-32 JAM
34	41”		TAPE, BLACK FOAM 1/2” WIDE 1/8” THICK
35	1	S5A5063	PCB ASSY, DISPLAY AZ CONNECTOR



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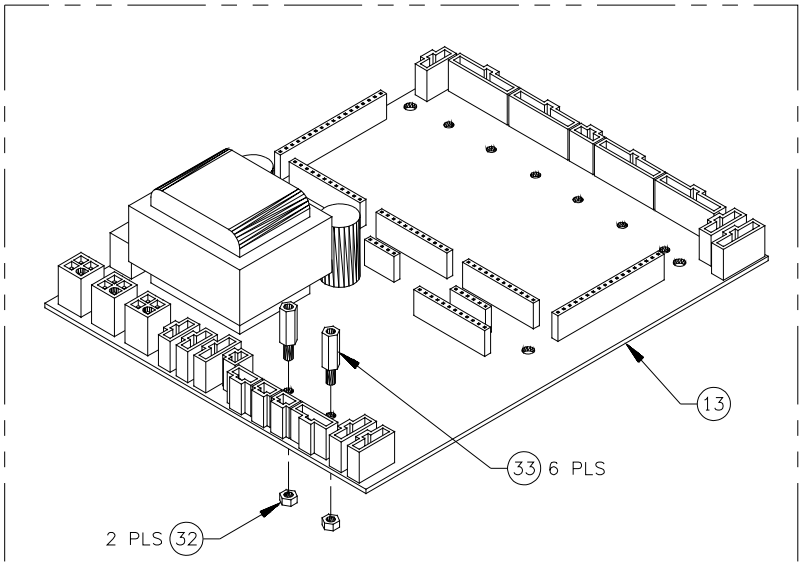

NOTE: INSTALL JUMPERS ON HEADER "JMP1" AT LOCATIONS "A" & "B" FOR 110VAC CONFIGURATION.

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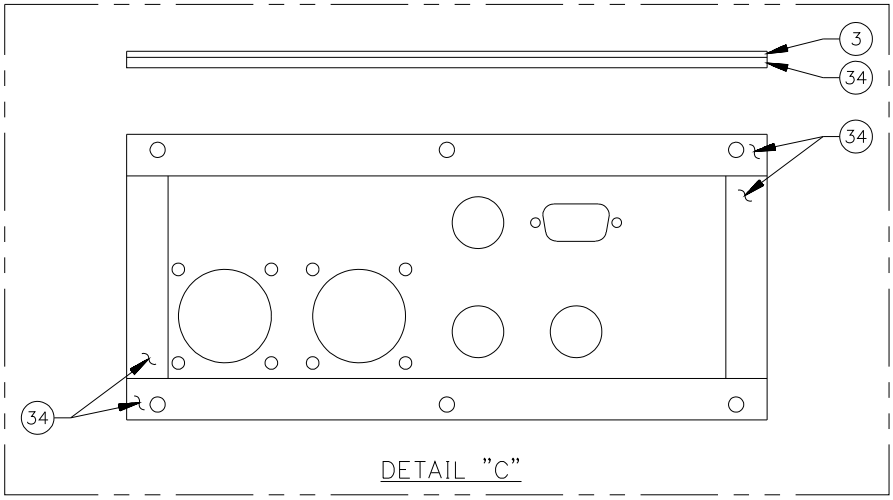

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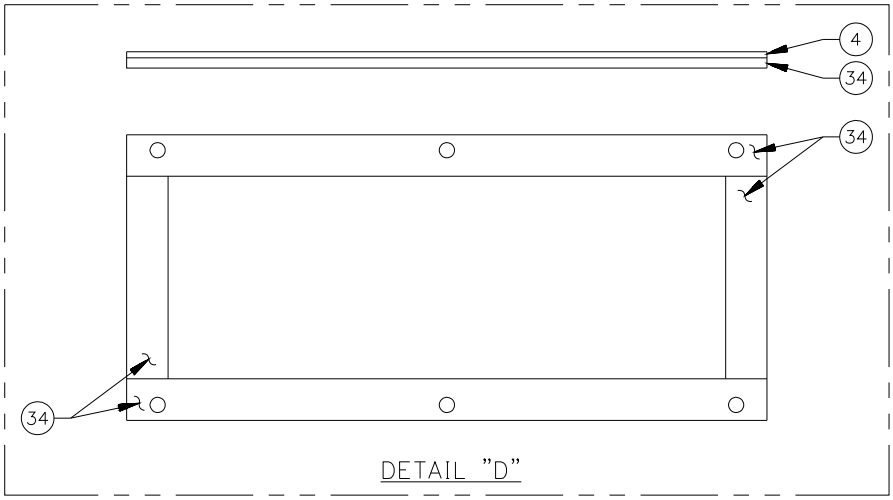

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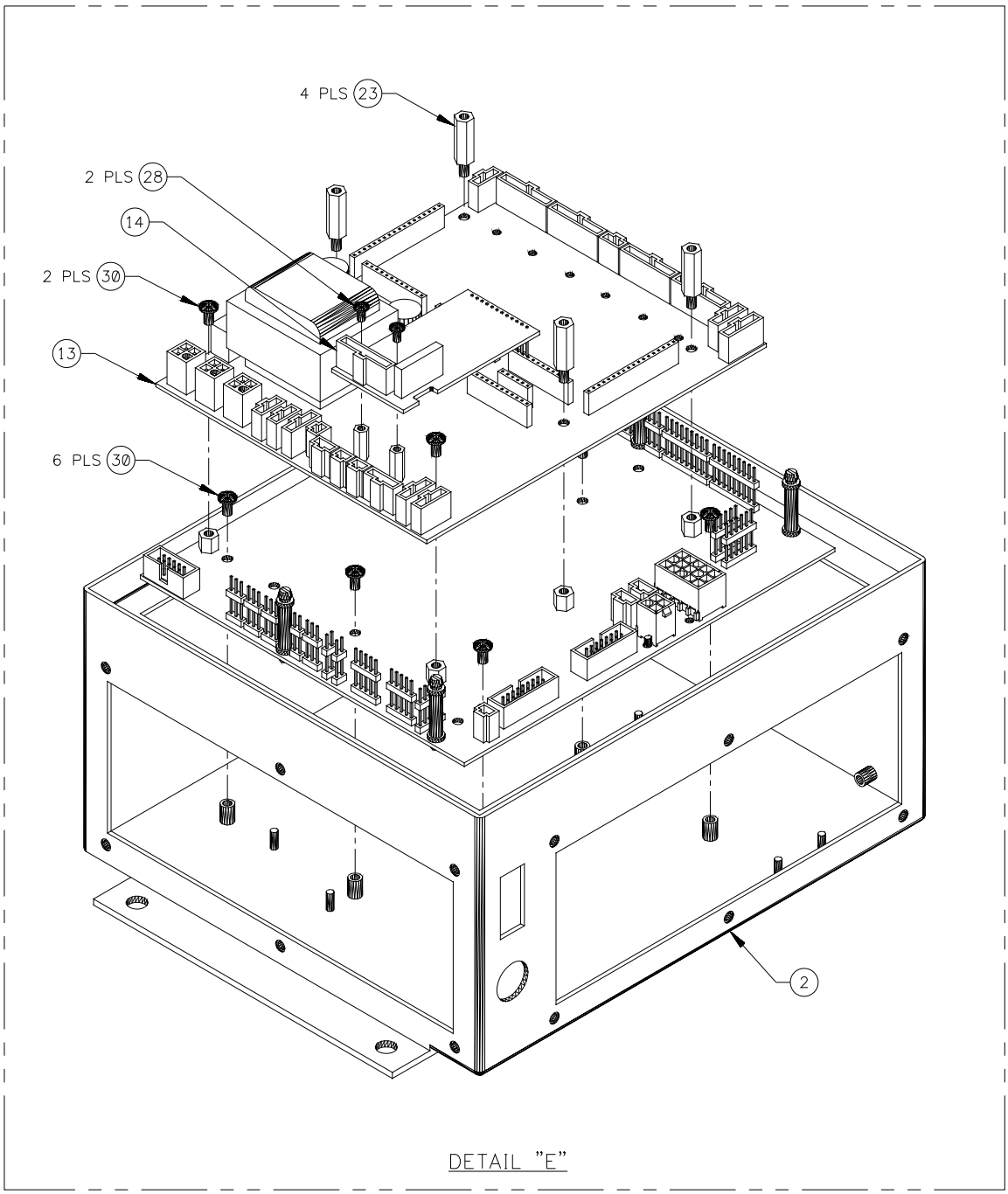

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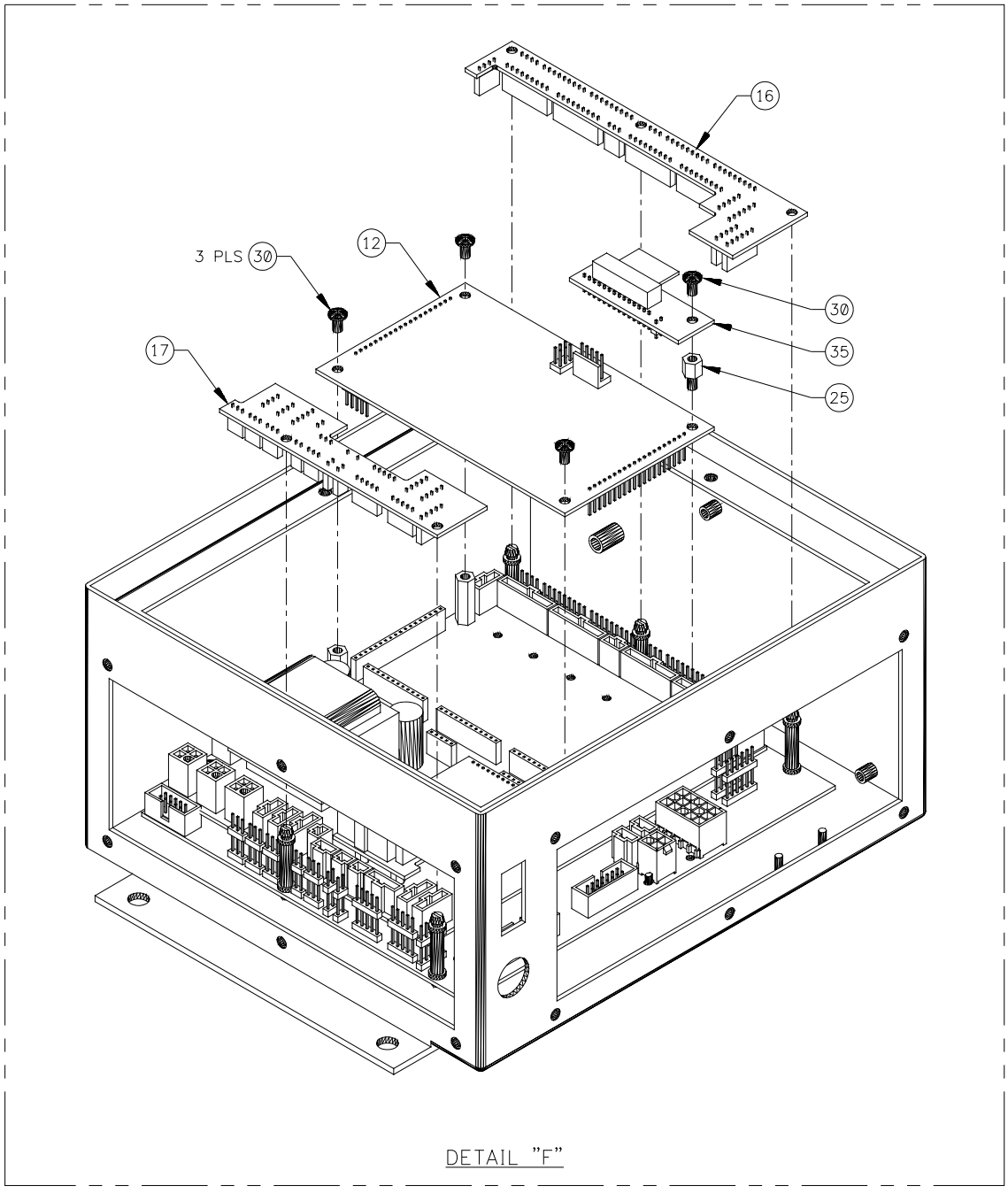

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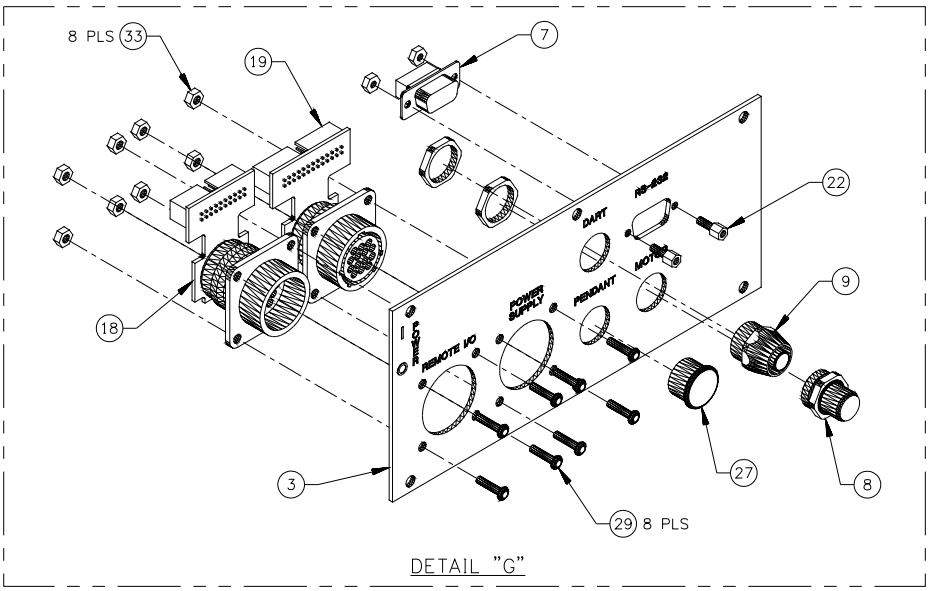

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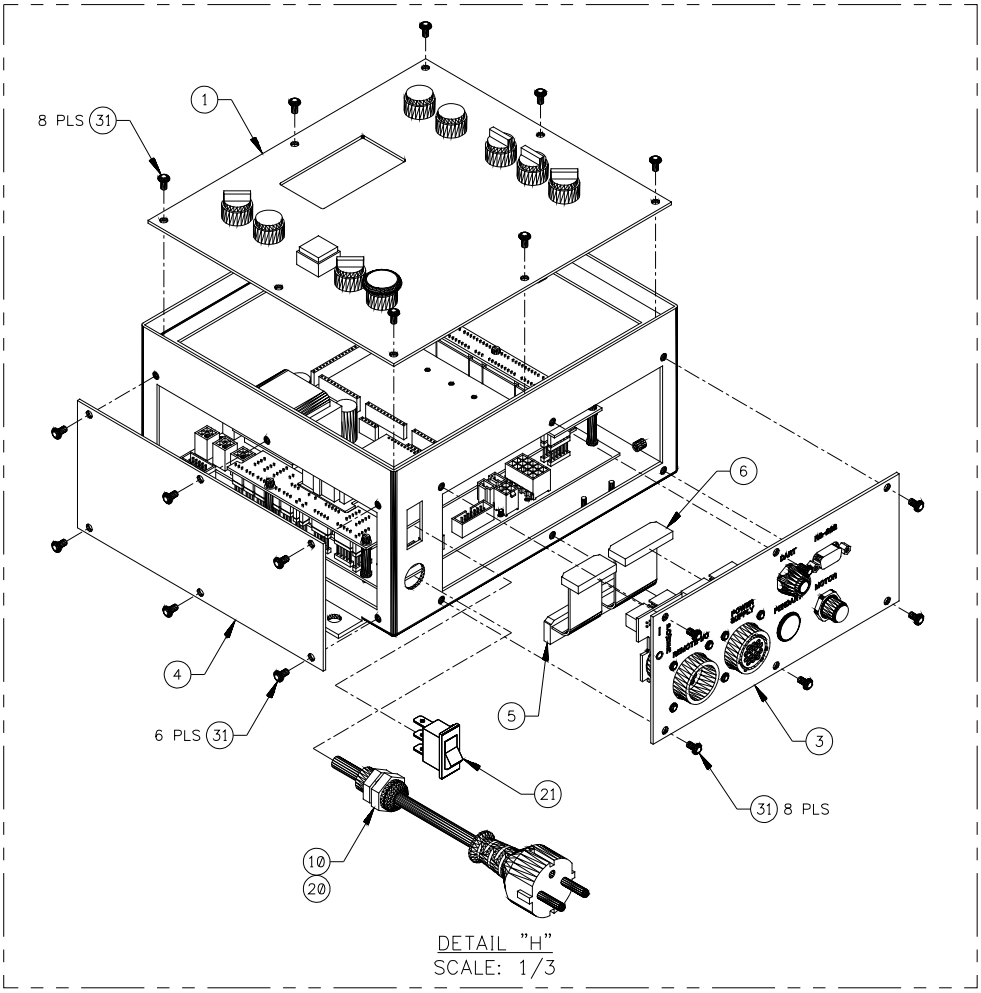
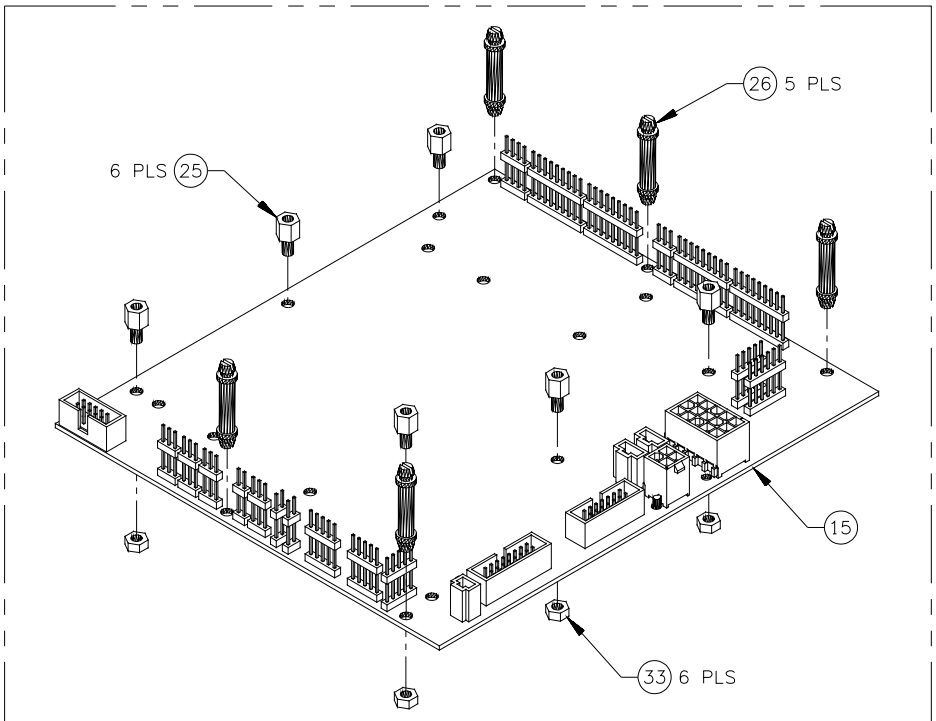
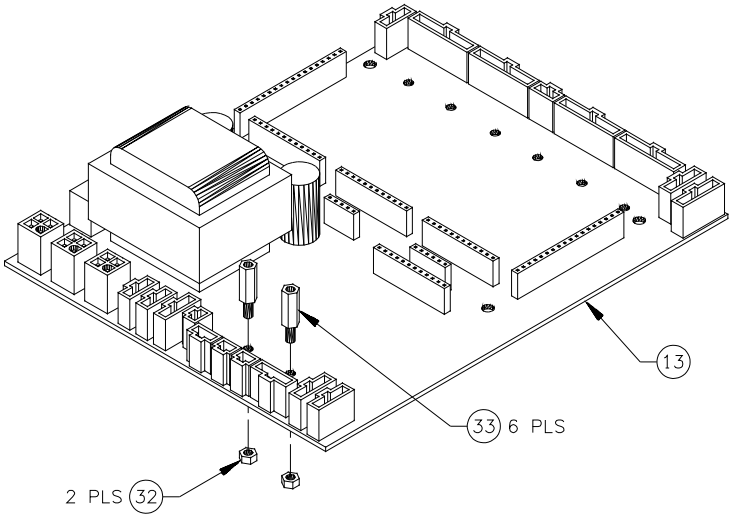


DETAIL "H"
SCALE: 1/3

ITEM	QTY	CWT P/N	DESCRIPTION
1	1	S3A5181	COVERT ASSY, UWC FRONT
2	1	S3E5078	ENCLOSURE, 9" X 8" X 4-1/2"
3	1	S3E5180	COVER, WSC BOTTOM
4	1	S3E5081	COVER, LARGE BLANK
5	1	S3W5179	CABLE, UWC REMOTE I/O
6	1	S3W5180	CABLE, UWC POWER SOURCE
7	1	S3W5181	CABLE, UWC RS-232
8	1	S3W5182	HARNESS, UWC TRAVEL
9	1	S3W5183	HARNESS, UWC SENSOR
10	1	S3W5184	HARNESS, UWC POWER SWITCH
11	1	S3W5186	CABLE, 220VAC POWER
12	1	S5A5033-UWC	PCB ASSY, MC6808GP32 - UWC
13	1	S5A5048	PCB ASSY, WELD I/O
14	1	S5A5049	PCB ASSY, I/O MODULE
15	1	S5A5071	PCB ASSY, UWC TERMINAL
16	1	S5A5072	PCB ASSY, UWC RIGHT CONNECTOR
17	1	S5A5073	PCB ASSY, UWC LEFT CONNECTOR
18	1	S5A5074	PCB ASSY, UWC REMOTE I/O CONNECTOR
19	1	S5A5075	PCB ASSY, UWC POWER SOURCE CONNECTOR
20	1	X3P5706	CONN, PLUG 4 CIRCUIT
21	1	X3S5090	SWITCH, ROCKER 220VDC
22	1	X3Z5027	SCREWLOCK KIT, STD FEMALE
23	4	X6S5023	SPACER, 6-32 X 1/2 M-F
24	2	X6S5053	SPACER, 4-40 X 1/2 M-F
25	7	X6S5057	SPACER, 6-32 X 1/4 M-F
26	5	X6S5070	SPACER, PCB 7/8” NYLON
27	1	X6Z5042	PLUG, HOLE #5/8" BLACK
28	2		SCREW, 4-40 X 1/4 PAN HEAD W/ INT LOCK WASHER
29	8		SCREW, 6-32 X 3/8 PAN HED
30	12		SCREW, 6-32 X 1/4 PAN HEAD W/ INT LOCK WASHER
31	20		SCREW, 6-32 X 3/8 PAN HEAD W/ INT LOCK WASHER
32	2		NUT, 4-40 JAM
33	14		NUT, 6-32 JAM
34	41”		TAPE, BLACK FOAM 1/2” WIDE 1/8” THICK
35	1	S5A5063	PCB ASSY, DISPLAY AZ CONNECTOR

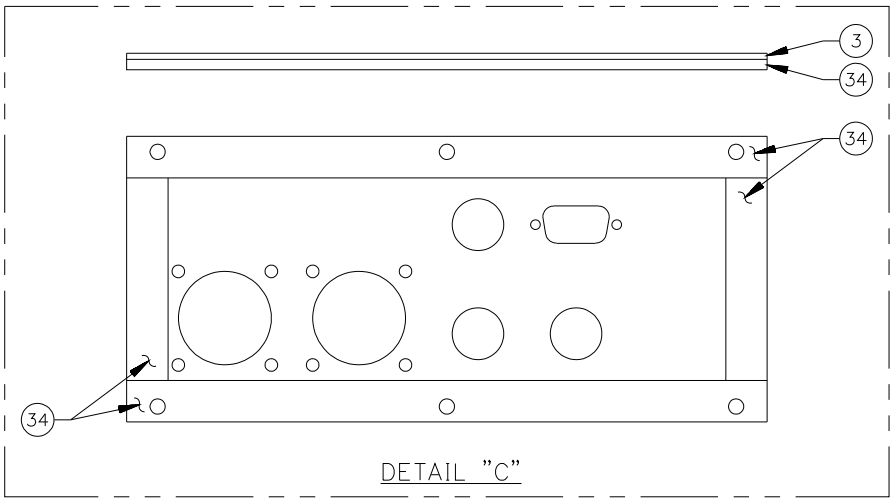


DETAIL "A"

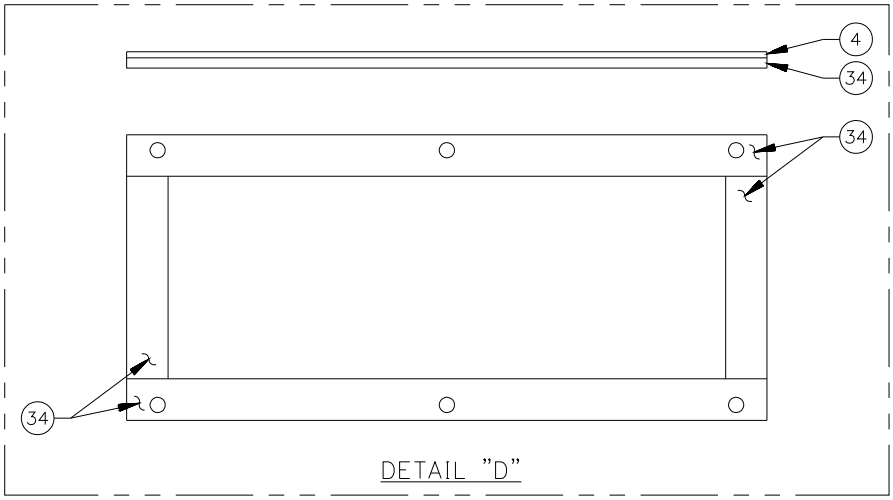


NOTE: INSTALL JUMPERS ON HEADER "JMP1" AT LOCATIONS "A" & "B" FOR 110VAC CONFIGURATION.

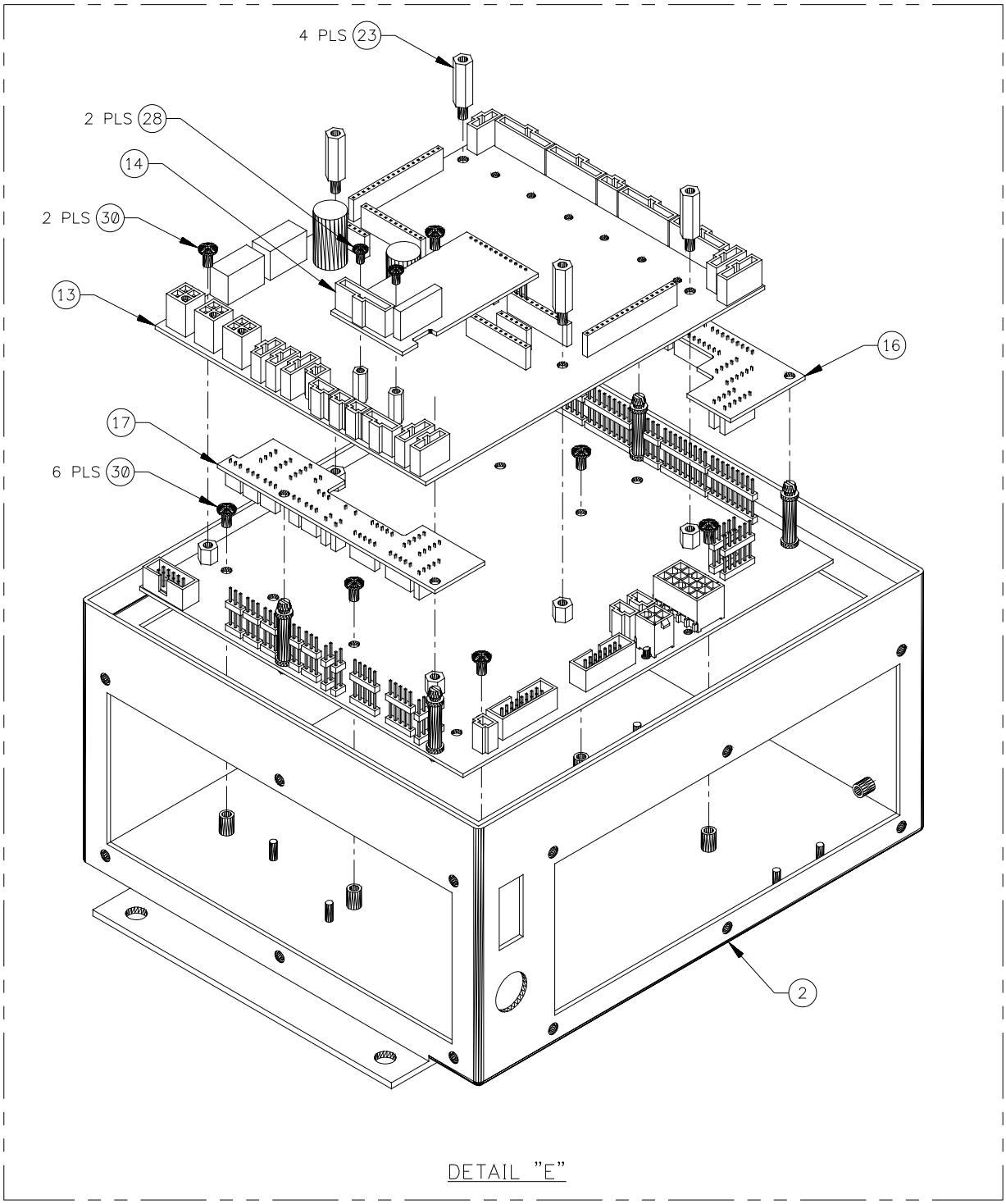
DETAIL "B"



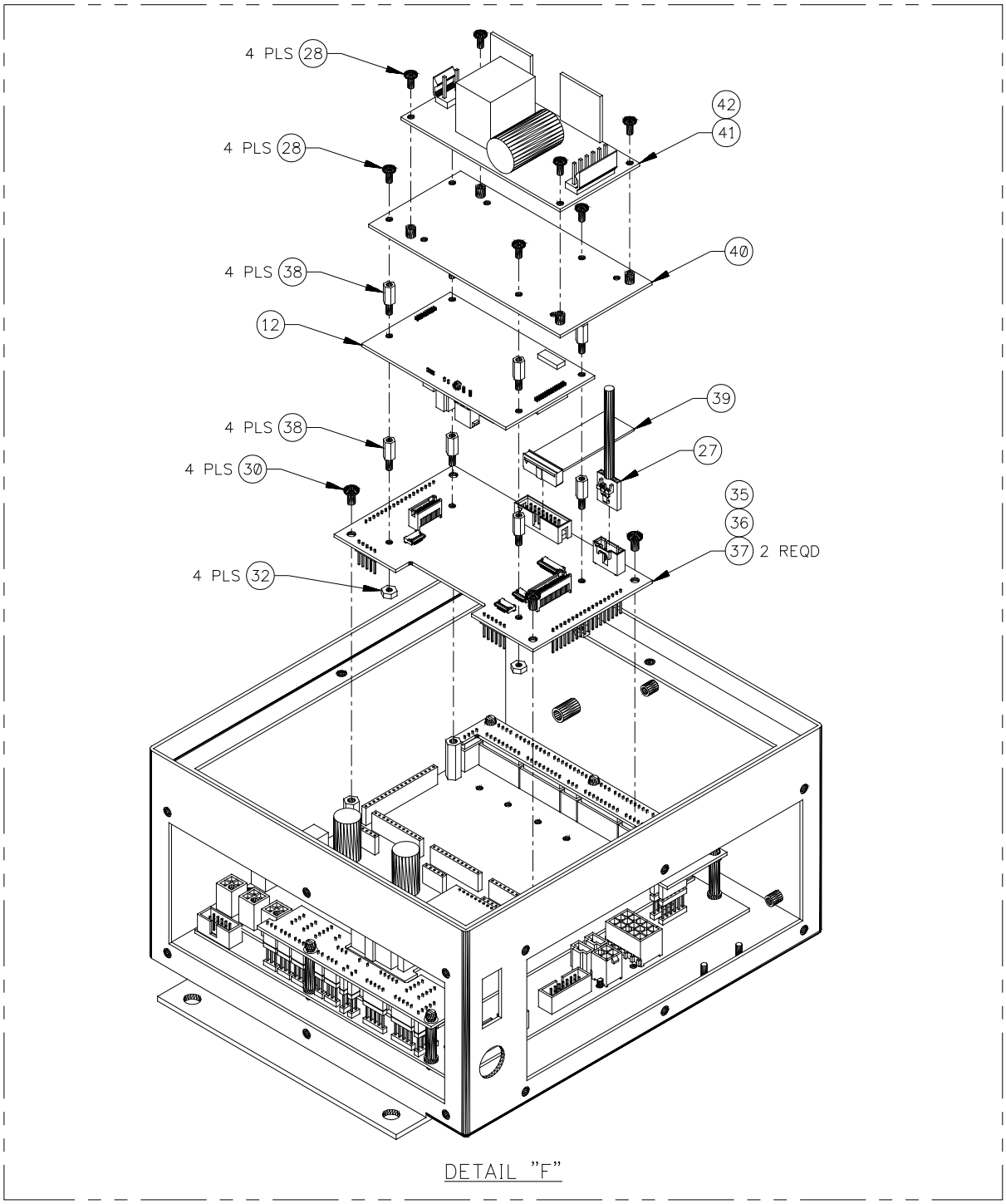
DETAIL "C"



DETAIL "D"



DETAIL "E"


4 PLS 28
4 PLS 28
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4 PLS 30
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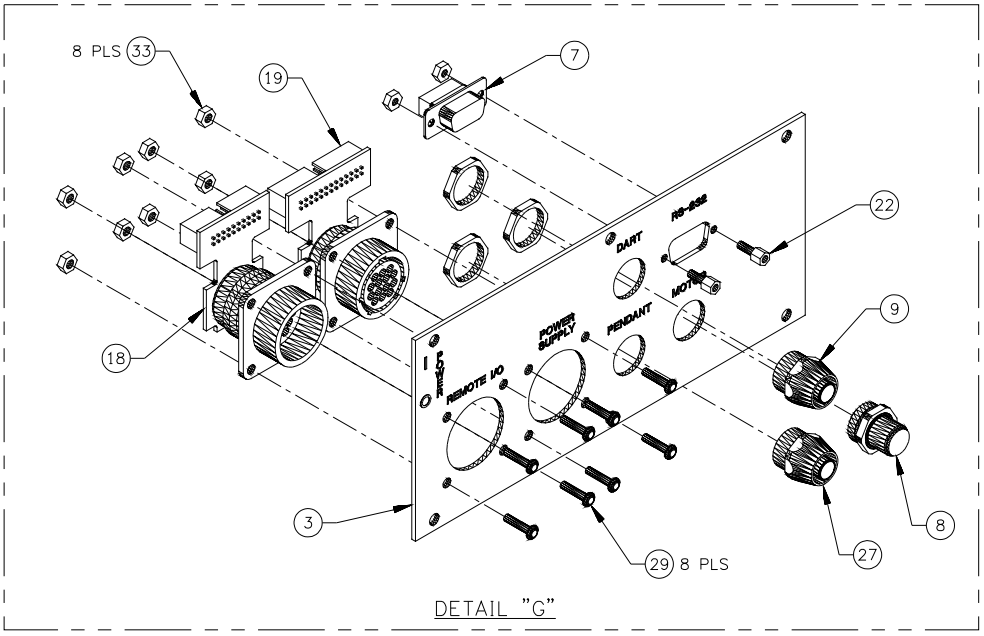
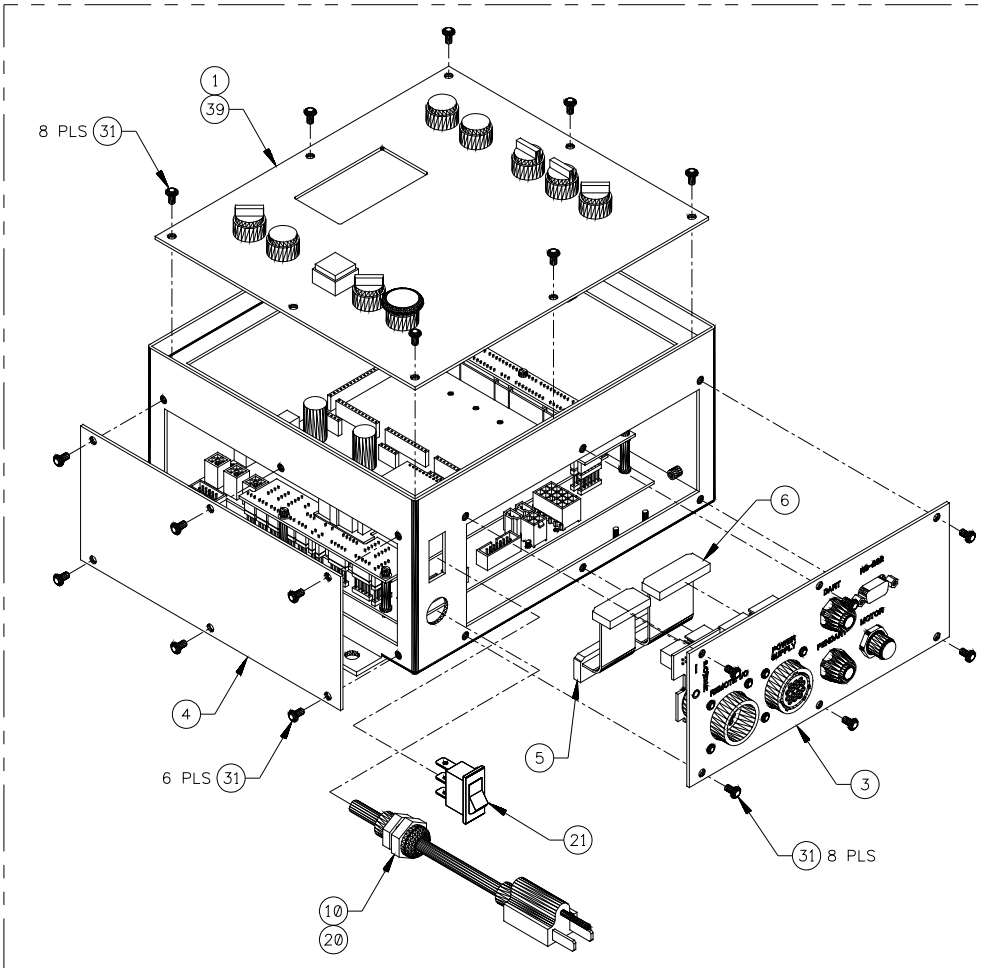
36
37 2 REQD

DETAIL "F"

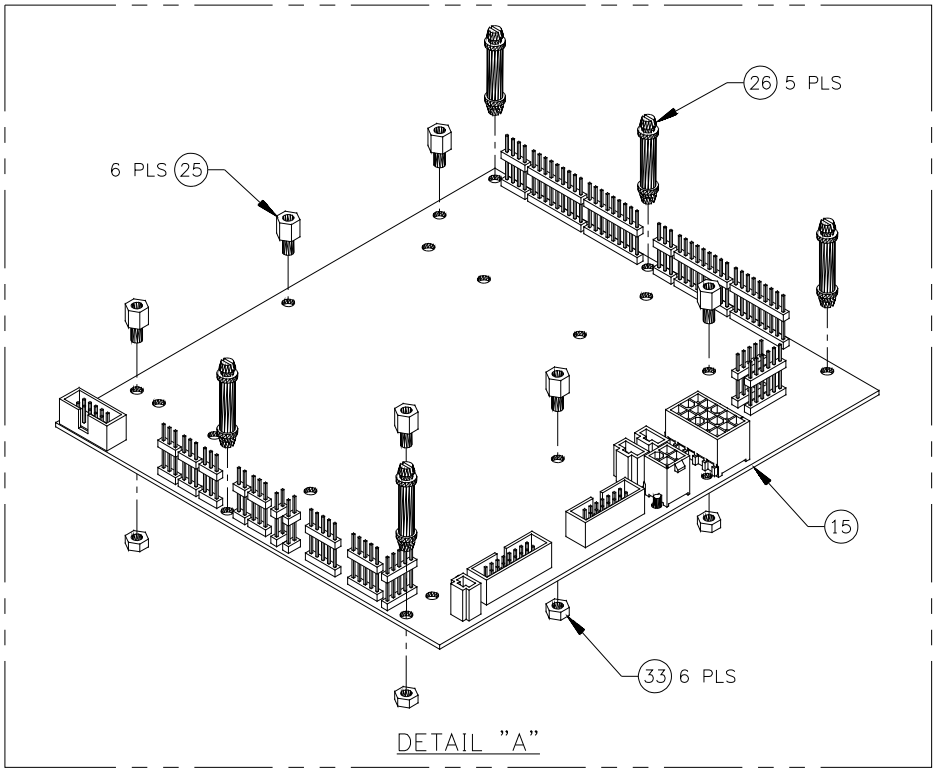


DETAIL "G"

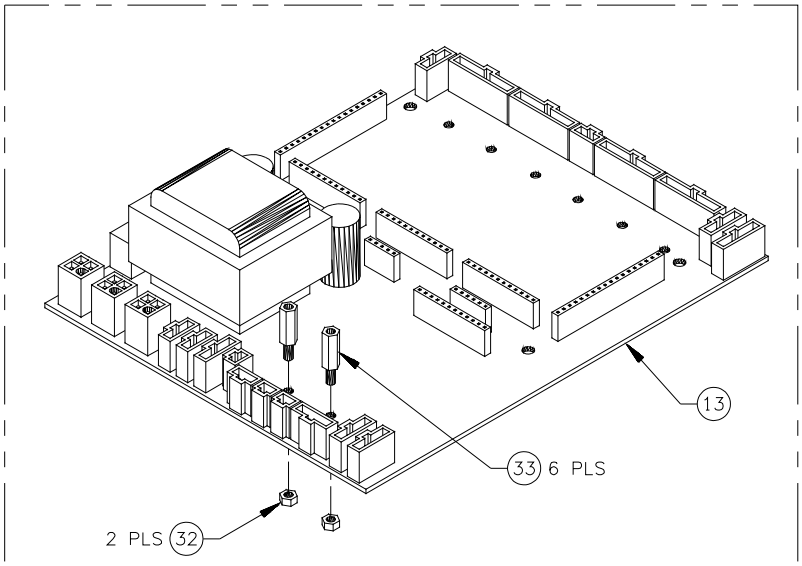


DETAIL "H"
SCALE: 1/3

ITEM	QTY	CWT P/N	DESCRIPTION
1	1	S3A5181	COVERT ASSY, UWC FRONT
2	1	S3E5078	ENCLOSURE, 9" X 8" X 4-1/2"
3	1	S3E5180	COVER, WSC BOTTOM
4	1	S3E5081	COVER, LARGE BLANK
5	1	S3W5179	CABLE, UWC REMOTE I/O
6	1	S3W5180	CABLE, UWC POWER SOURCE
7	1	S3W5181	CABLE, UWC RS-232
8	1	S3W5182	HARNESS, UWC TRAVEL
9	1	S3W5183	HARNESS, UWC SENSOR
10	1	S3W5184	HARNESS, UWC POWER SWITCH
11	1	S3W5185	CABLE, 110VAC POWER
12	1	A5A0191-UWC	PCB ASSY, MC9S08GB60 CPUP - UWC
13	1	S5A5048	PCB ASSY, WELD I/O
14	1	S5A5049	PCB ASSY, I/O MODULE
15	1	S5A5071	PCB ASSY, UWC TERMINAL
16	1	S5A5072	PCB ASSY, UWC RIGHT CONNECTOR
17	1	S5A5073	PCB ASSY, UWC LEFT CONNECTOR
18	1	S5A5074	PCB ASSY, UWC REMOTE I/O CONNECTOR
19	1	S5A5075	PCB ASSY, UWC POWER SOURCE CONNECTOR
20	1	X3P5706	CONN, PLUG 4 CIRCUIT
21	1	X3S5078	SWITCH, ROCKER 110VDC
22	1	X3Z5027	SCREWLOCK KIT, STD FEMALE
23	4	X6S5023	SPACER, 6-32 X 1/2 M-F
24	2	X6S5053	SPACER, 4-40 X 1/2 M-F
25	7	X6S5057	SPACER, 6-32 X 1/4 M-F
26	5	X6S5070	SPACER, PCB 7/8” NYLON
27	1	S3W5229	HARNESS, MSC II COMM
28	6		SCREW, 4-40 X 1/4 PAN HEAD W/ INT LOCK WASHER
29	8		SCREW, 6-32 X 3/8 PAN HED
30	12		SCREW, 6-32 X 1/4 PAN HEAD W/ INT LOCK WASHER
31	20		SCREW, 6-32 X 3/8 PAN HEAD W/ INT LOCK WASHER
32	6		NUT, 4-40 JAM
33	14		NUT, 6-32 JAM
34	41”		TAPE, BLACK FOAM 1/2” WIDE 1/8” THICK
35	1	S5A5094	PCB ASSY, 9S08GB ADAPTOR
36	3	X3W5132	CABLE, FFC/FPC JUMPER 0.5MM 10 CIRCUIT 50MM
37	1	X3W5136	CABLE, FFC/FPC JUMPER 0.5MM 18 CIRCUIT 50MM
38	8	X6S5072	SPACER, 4-40 X 3/8 M-F
39	1	S3W5230	CABLE, DISPLAY
40	1	S3E5157	PLATE, UWC POWER SUPPLY
41	1	X3T5095	SUPPLY, POWER AC-DC 24VDC 40W
42	1	S3W5238	HARNESS, UWC POWER SUPPLY AC

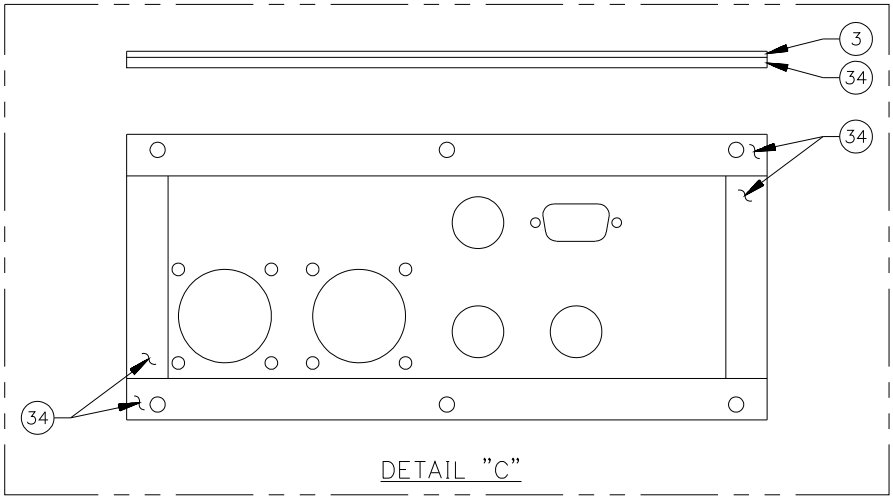


DETAIL "A"

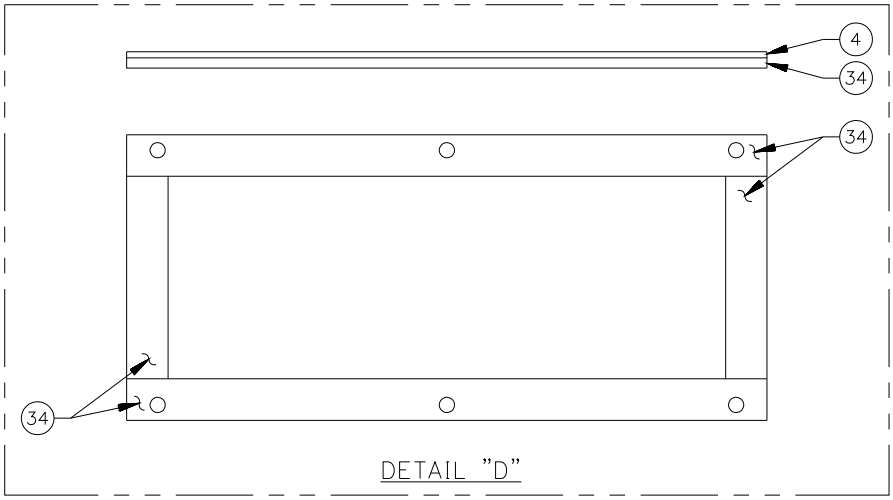


NOTE: INSTALL JUMPERS ON HEADER "JMP1" AT LOCATIONS "A" & "B" FOR 110VAC CONFIGURATION.

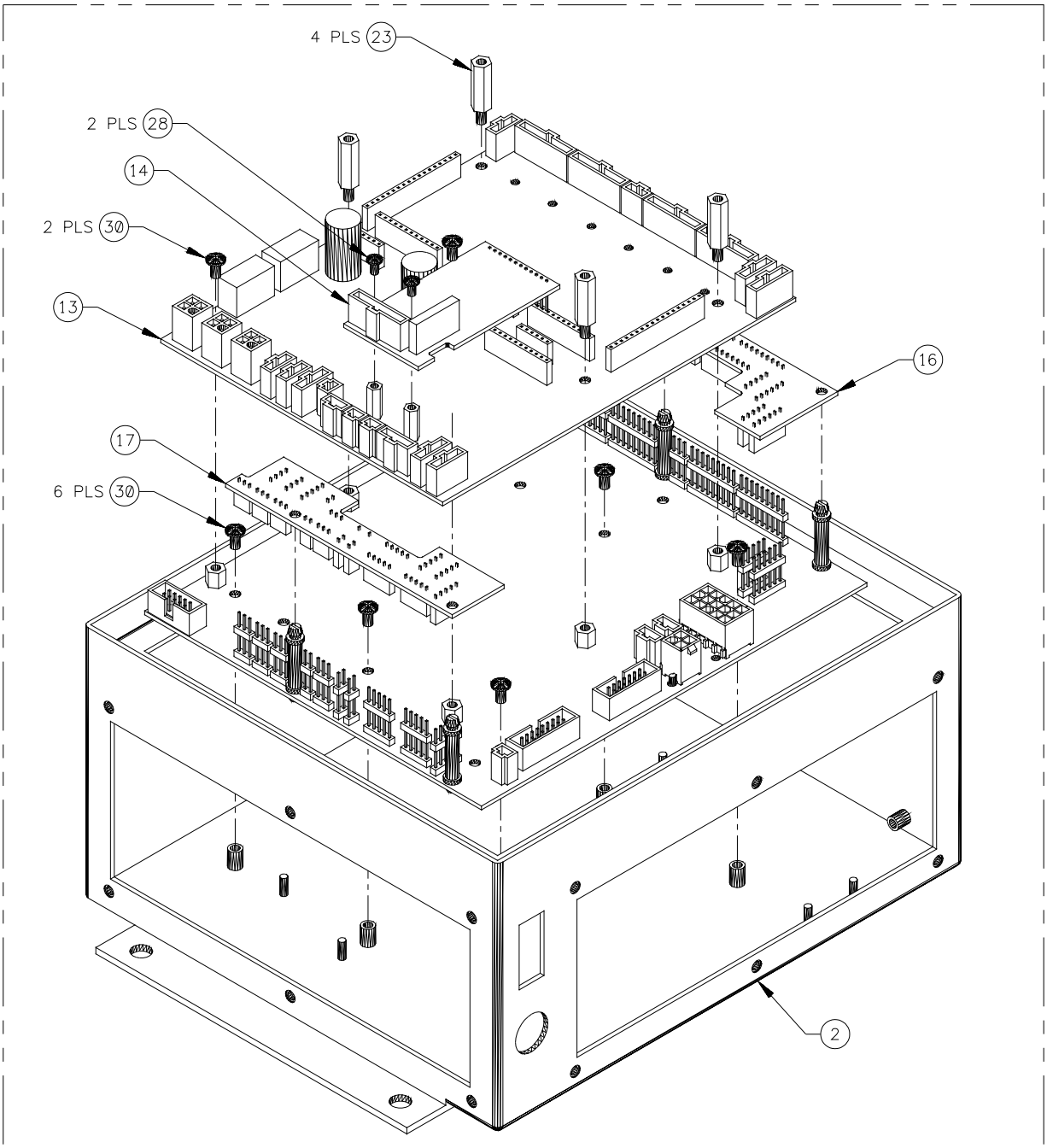
DETAIL "B"



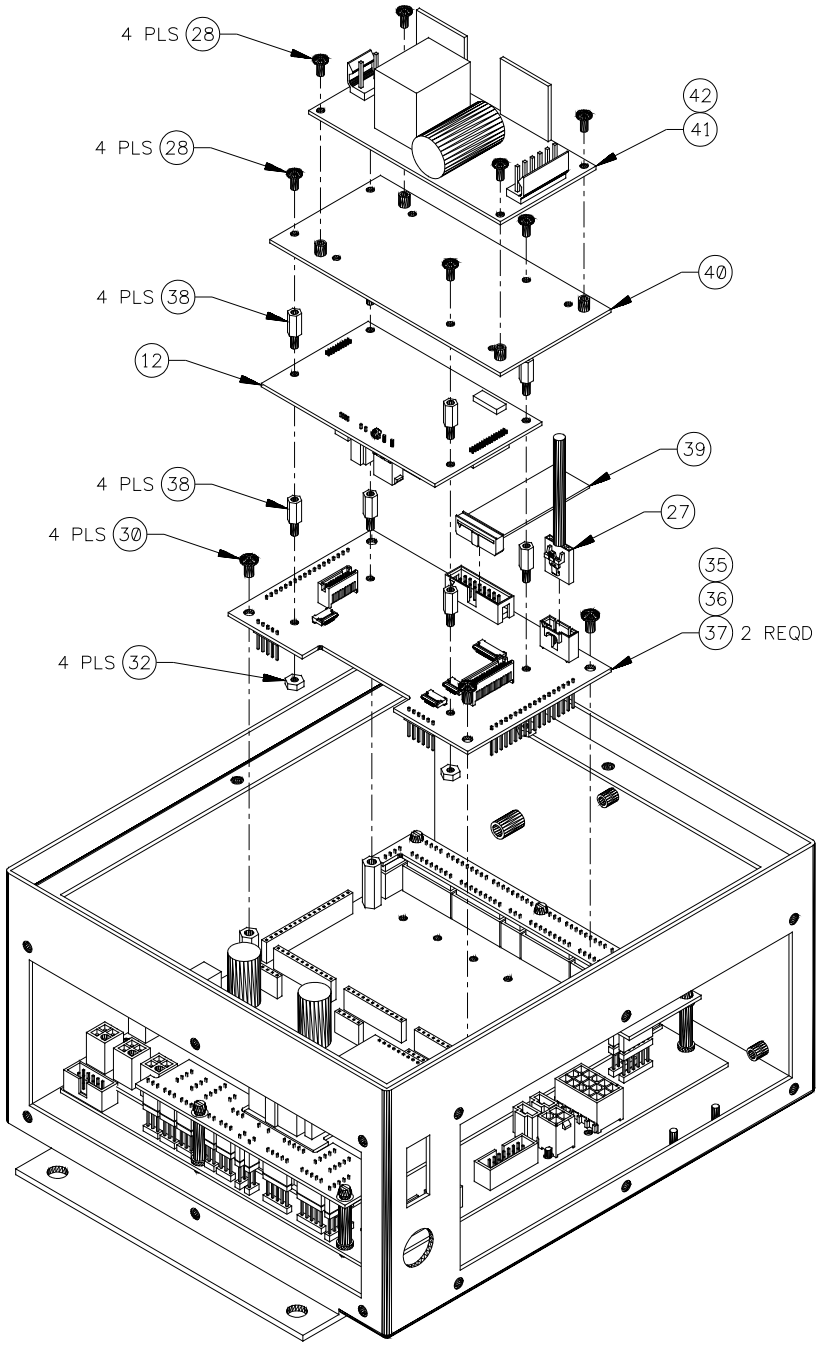
DETAIL "C"



DETAIL "D"



DETAIL "E"


4 PLS 28
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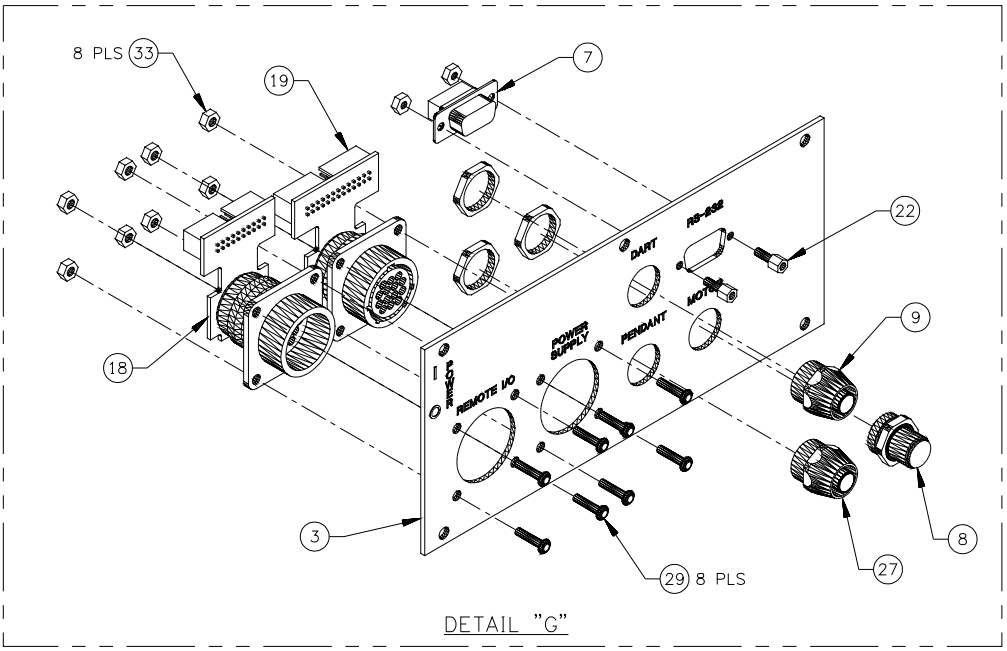
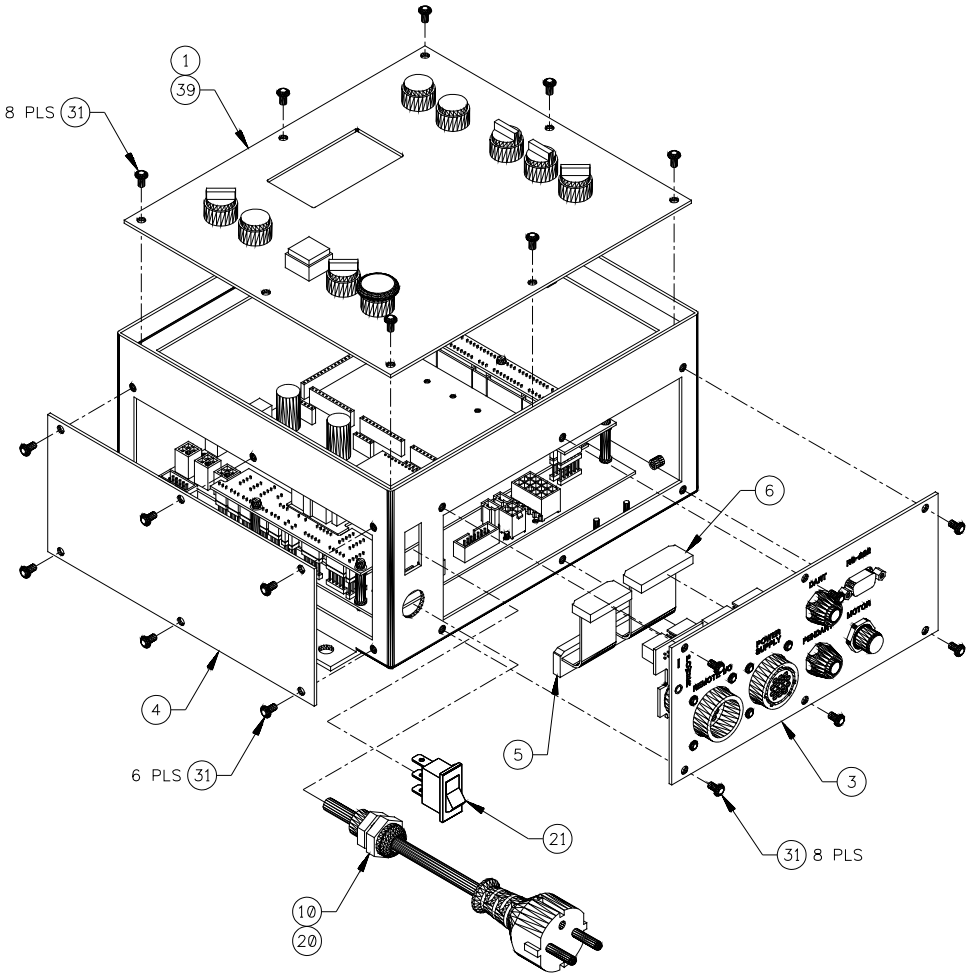
37 2 REQD

DETAIL "F"



DETAIL "G"

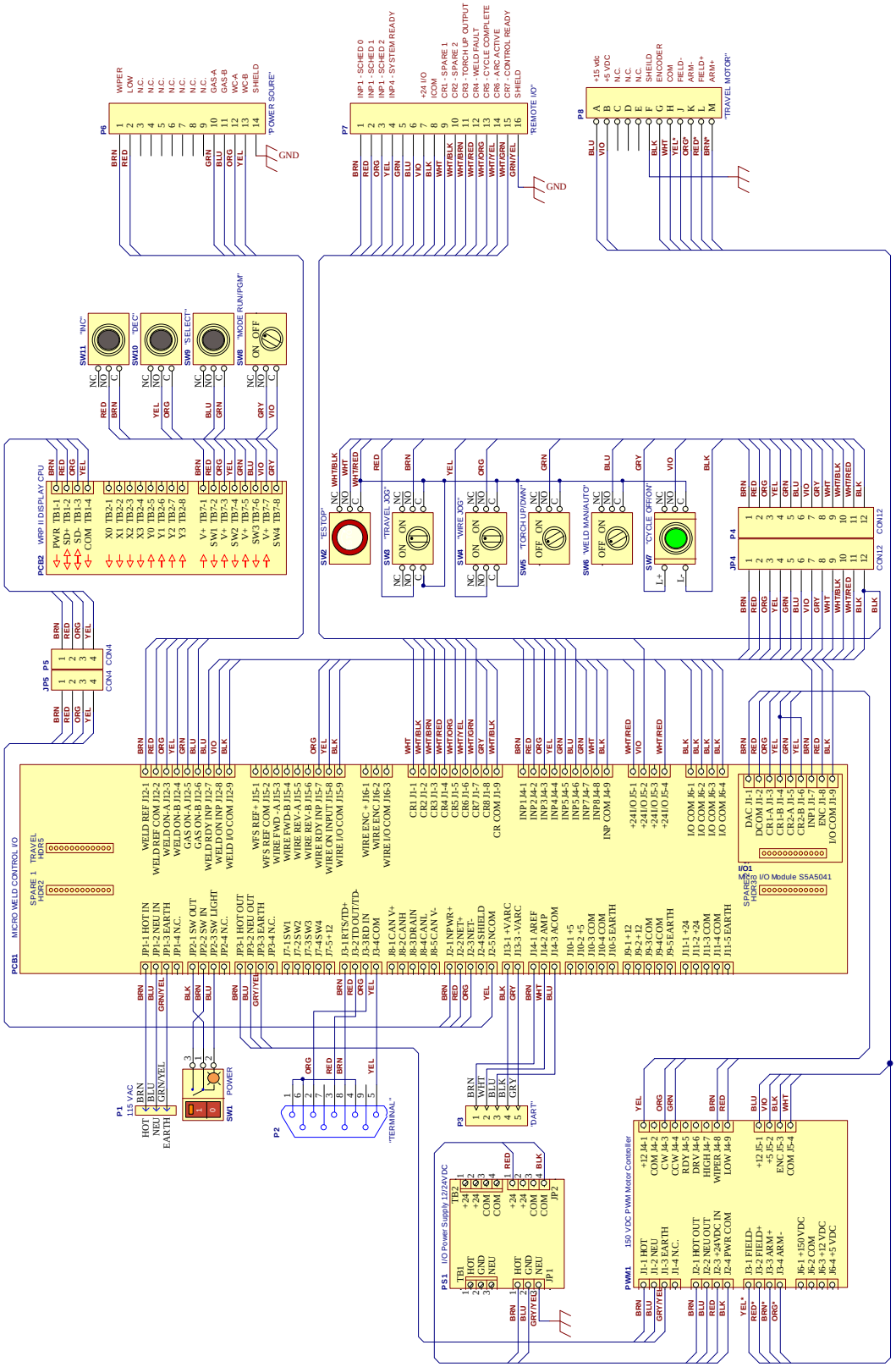


DETAIL "H"
SCALE: 1/3

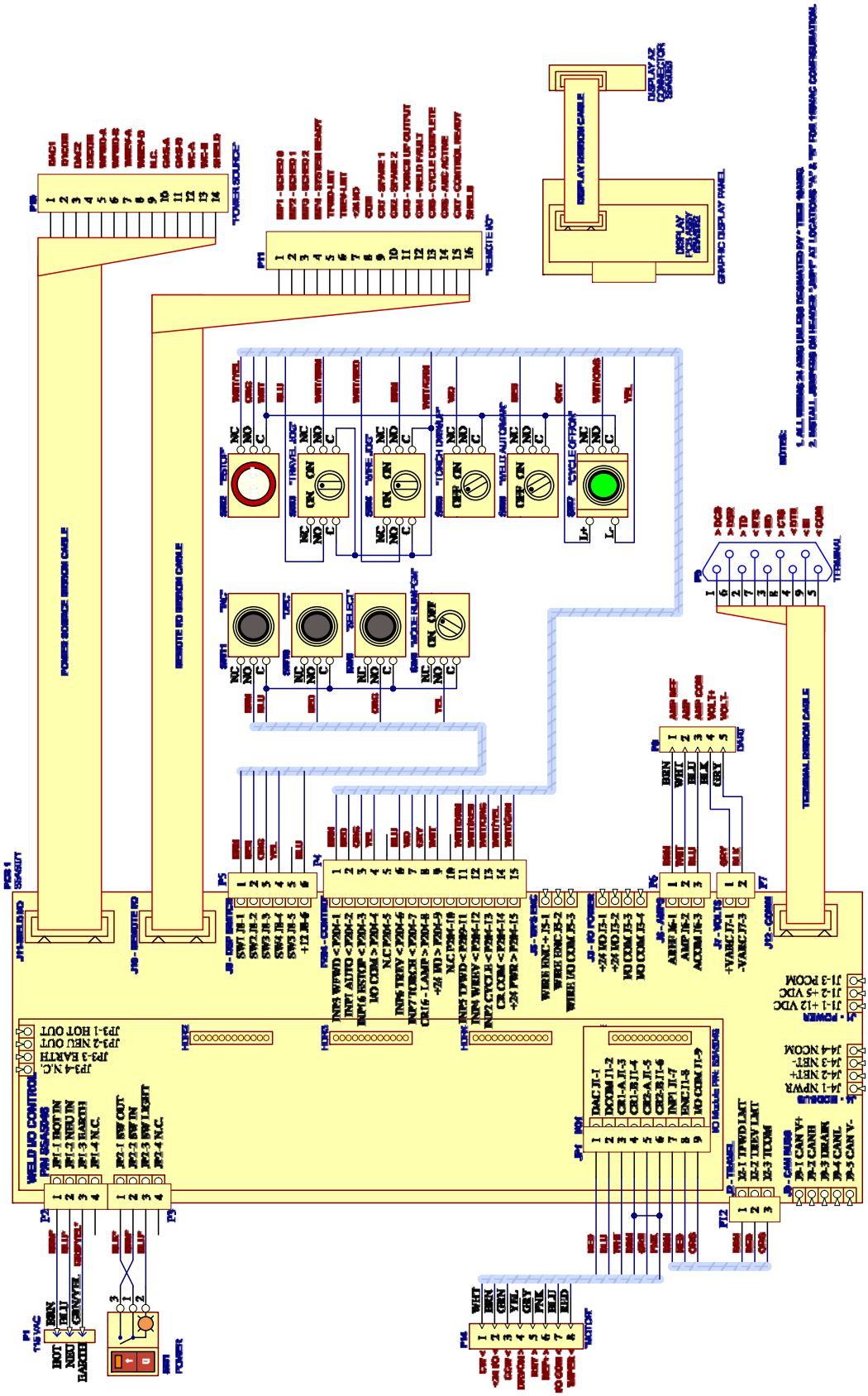
ITEM	QTY	CWT P/N	DESCRIPTION
1	1	S3A5181	COVERT ASSY, UWC FRONT
2	1	S3E5078	ENCLOSURE, 9" X 8" X 4-1/2"
3	1	S3E5180	COVER, WSC BOTTOM
4	1	S3E5081	COVER, LARGE BLANK
5	1	S3W5179	CABLE, UWC REMOTE I/O
6	1	S3W5180	CABLE, UWC POWER SOURCE
7	1	S3W5181	CABLE, UWC RS-232
8	1	S3W5182	HARNESS, UWC TRAVEL
9	1	S3W5183	HARNESS, UWC SENSOR
10	1	S3W5184	HARNESS, UWC POWER SWITCH
11	1	S3W5186	CABLE, 220VAC POWER
12	1	A5A0191-UWC	PCB ASSY, MC9S08GB60 CPUP - UWC
13	1	S5A5048	PCB ASSY, WELD I/O
14	1	S5A5049	PCB ASSY, I/O MODULE
15	1	S5A5071	PCB ASSY, UWC TERMINAL
16	1	S5A5072	PCB ASSY, UWC RIGHT CONNECTOR
17	1	S5A5073	PCB ASSY, UWC LEFT CONNECTOR
18	1	S5A5074	PCB ASSY, UWC REMOTE I/O CONNECTOR
19	1	S5A5075	PCB ASSY, UWC POWER SOURCE CONNECTOR
20	1	X3P5706	CONN, PLUG 4 CIRCUIT
21	1	X3S5090	SWITCH, ROCKER 220VDC
22	1	X3Z5027	SCREWLOCK KIT, STD FEMALE
23	4	X6S5023	SPACER, 6-32 X 1/2 M-F
24	2	X6S5053	SPACER, 4-40 X 1/2 M-F
25	7	X6S5057	SPACER, 6-32 X 1/4 M-F
26	5	X6S5070	SPACER, PCB 7/8” NYLON
27	1	S3W5229	HARNESS, MSC II COMM
28	6		SCREW, 4-40 X 1/4 PAN HEAD W/ INT LOCK WASHER
29	8		SCREW, 6-32 X 3/8 PAN HED
30	12		SCREW, 6-32 X 1/4 PAN HEAD W/ INT LOCK WASHER
31	20		SCREW, 6-32 X 3/8 PAN HEAD W/ INT LOCK WASHER
32	6		NUT, 4-40 JAM
33	14		NUT, 6-32 JAM
34	41”		TAPE, BLACK FOAM 1/2” WIDE 1/8” THICK
35	1	S5A5094	PCB ASSY, 9S08GB ADAPTOR
36	3	X3W5132	CABLE, FFC/FPC JUMPER 0.5MM 10 CIRCUIT 50MM
37	1	X3W5136	CABLE, FFC/FPC JUMPER 0.5MM 18 CIRCUIT 50MM
38	8	X6S5072	SPACER, 4-40 X 3/8 M-F
39	1	S3W5230	CABLE, DISPLAY
40	1	S3E5157	PLATE, UWC POWER SUPPLY
41	1	X3T5095	SUPPLY, POWER AC-DC 24VDC 40W
42	1	S3W5238	HARNESS, UWC POWER SUPPLY AC

8.3 Universal Weld Control Enclosure Schematic Diagrams

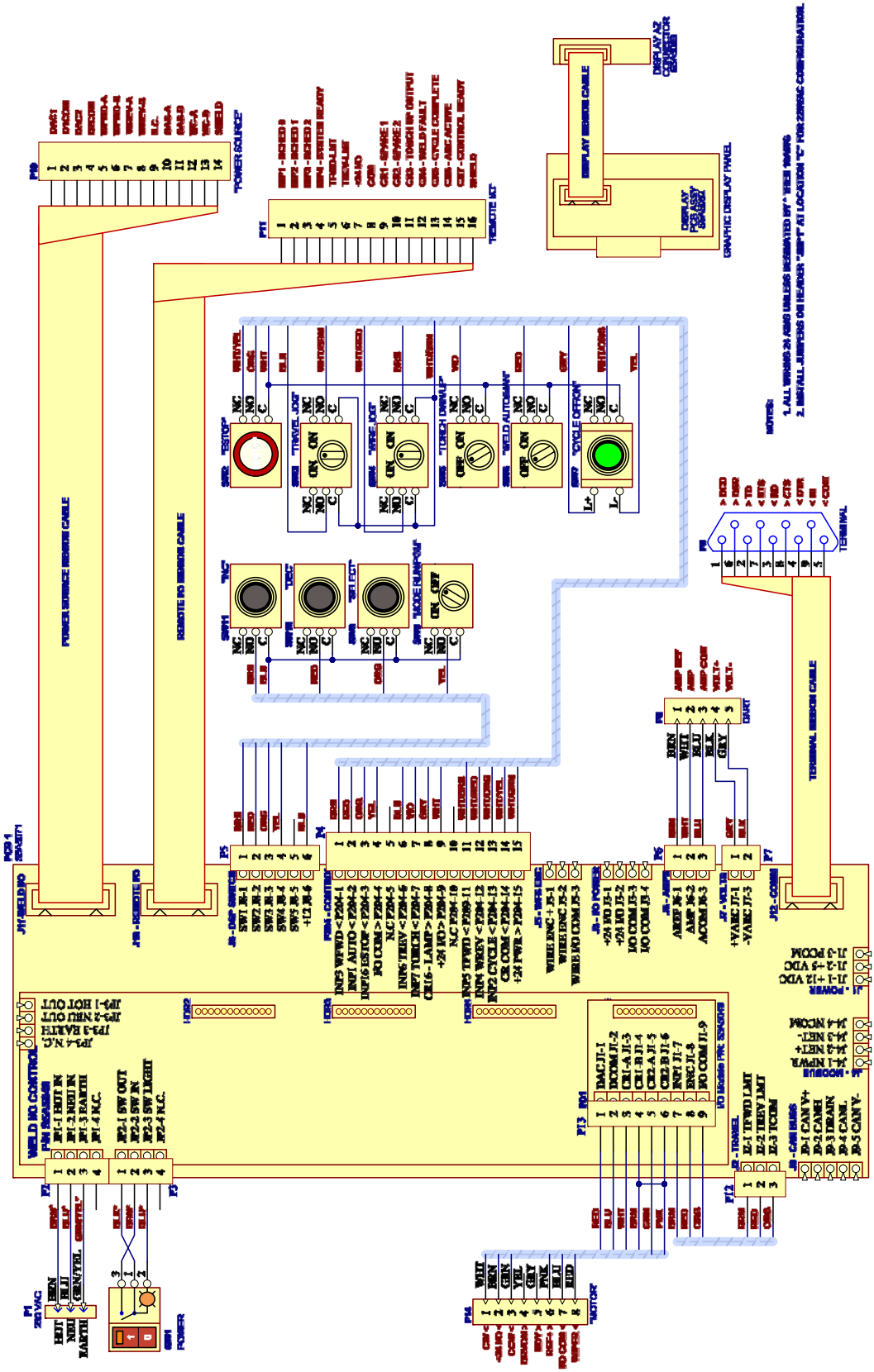
Schematic Diagram for UWC Enclosure – P/N: S3A5138, S3A5140 and S3A5144



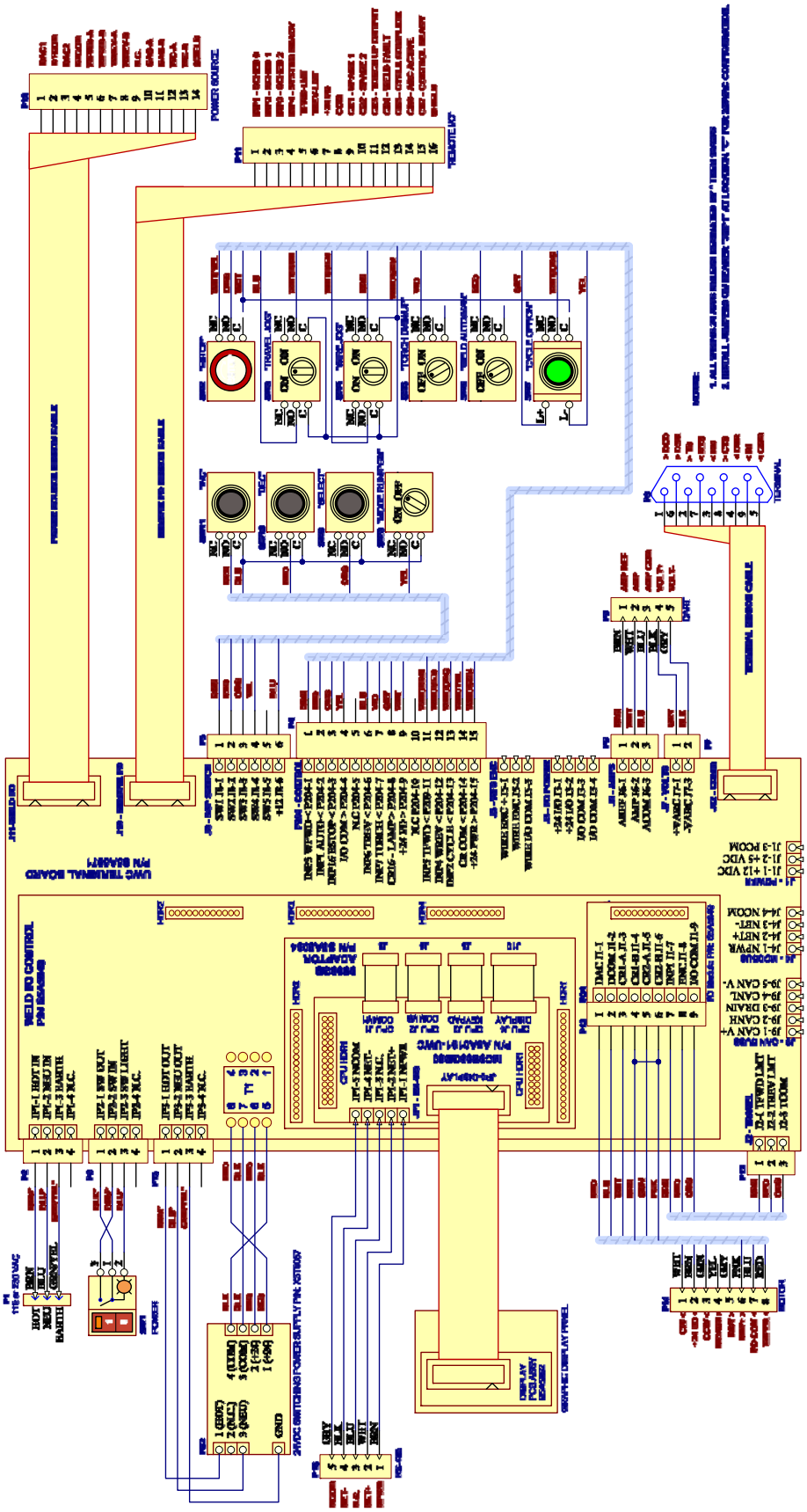
Schematic Diagram for UWC Enclosure 110VAC – P/N: S3A5180



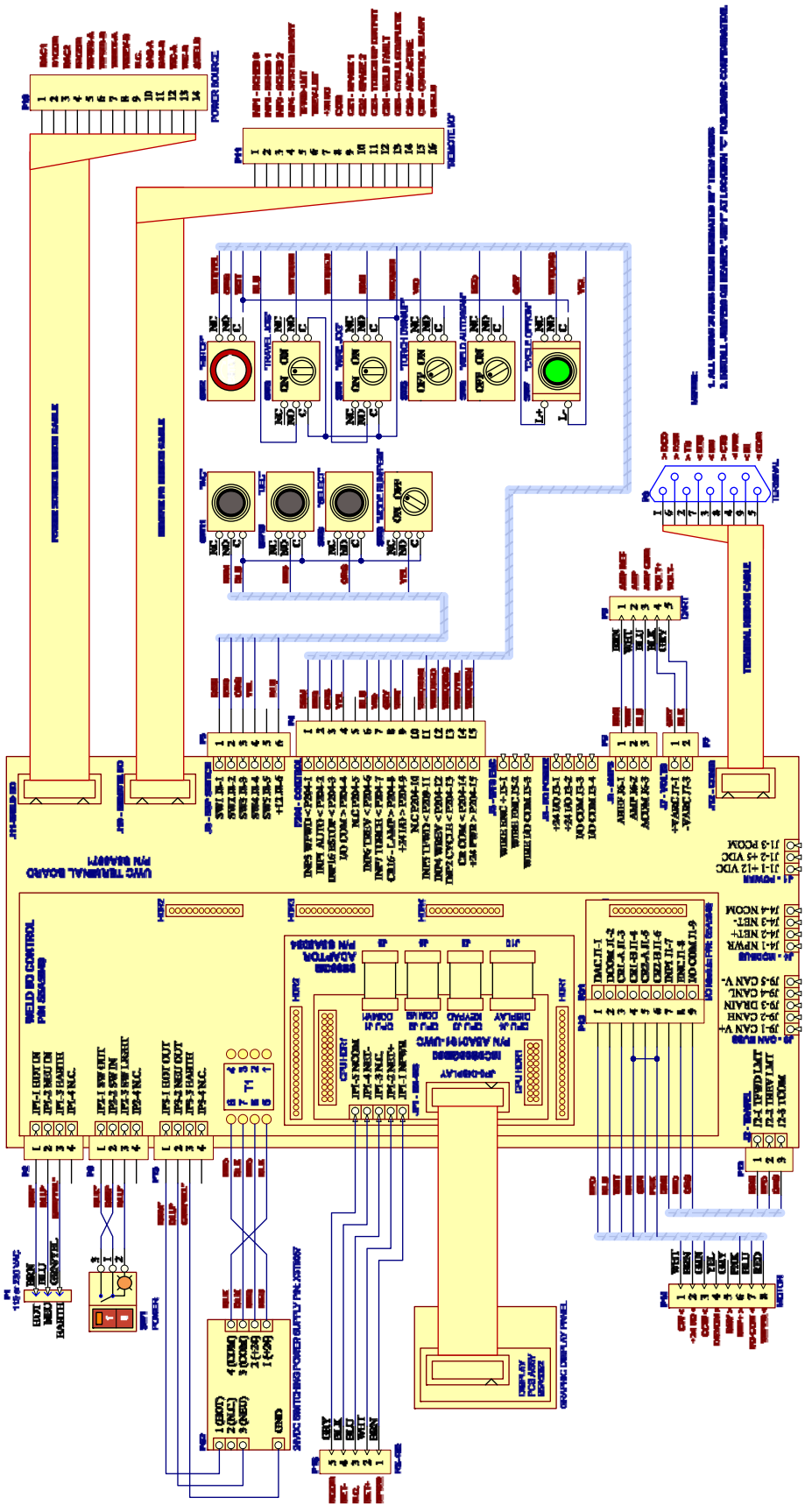
Schematic Diagram for UWC Enclosure 220VAC – P/N: S3A5182



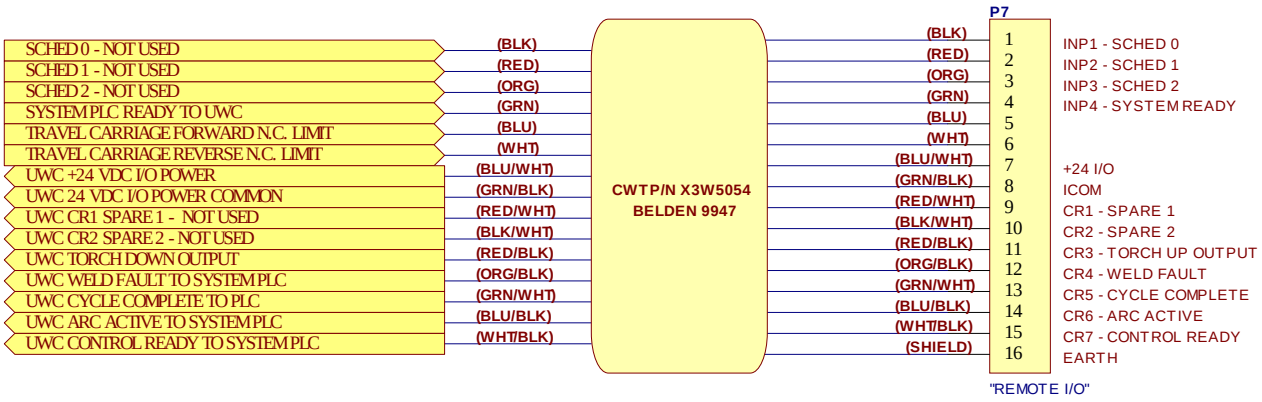
Schematic Diagram for UWC Enclosure 110VAC – P/N: S3A5211



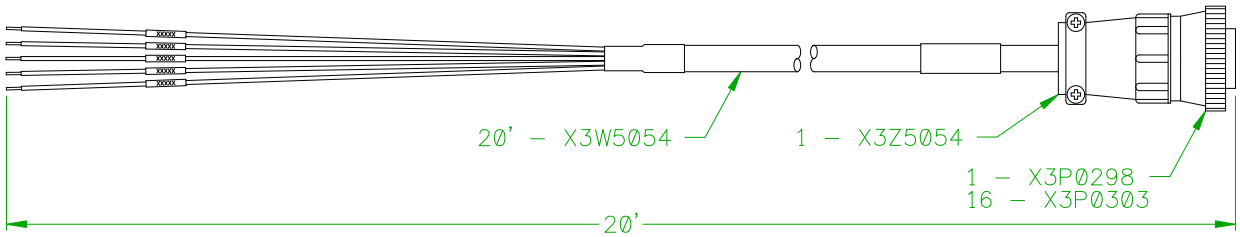
Schematic Diagram for UWC Enclosure 220VAC – P/N: S3A5212

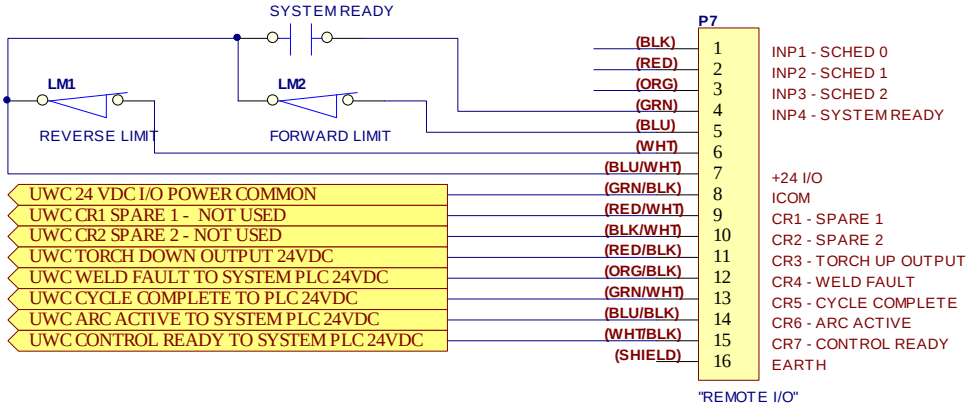


8.4 Remote I/O Cable P/N: S3W5129



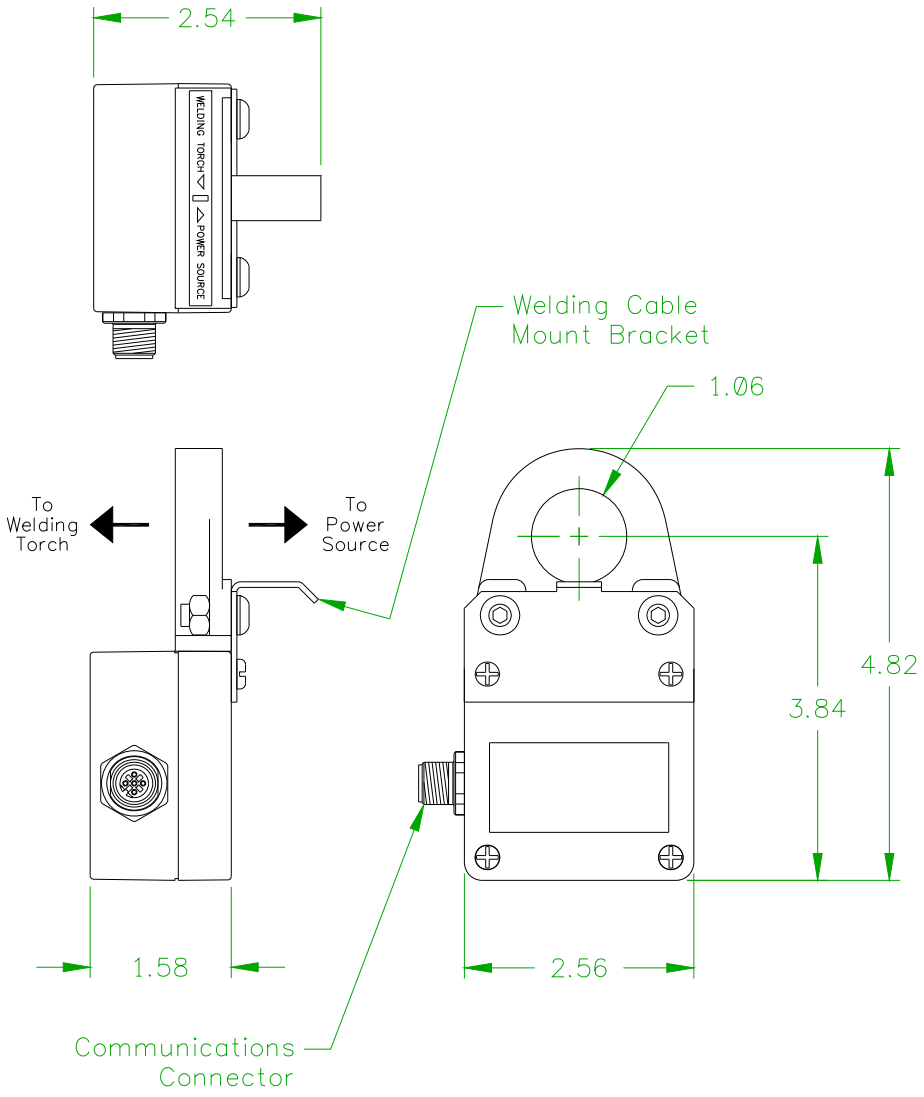
CABLE WIRING DIAGRAM





TYPICAL USER PROVIDED EXTERNAL WIRING DIAGRAM

8.5 Current/Voltage Sensor P/N: A3A0248



Pin	Mode	Description	Color
1	Output	The 10 VDC output signal to the current sensor probe	BRN
2	Input	The current sensor input signal from current sensor probe	WHT
3	Input	Analog common return from current sensor probe	BLU
4	Input	+ Arc voltage sense from current sensor probe	BLK
5	Input	- Arc Voltage sense from current sensor probe	GRY