

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

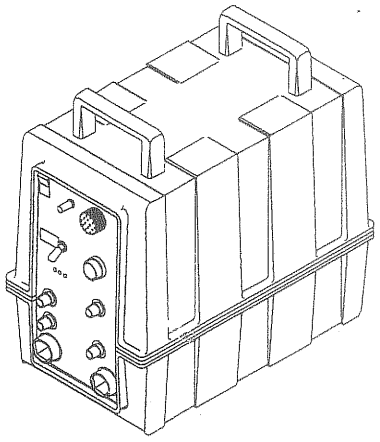
All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Arc Products / ITW / PowCon 101606-002* at our website: *Click HERE*

PowCon®

! IMPORTANT !
-FOR YOUR SAFETY-
READ THIS MANUAL BEFORE INSTALLING OR USING EQUIPMENT

OPERATION MANUAL



CE

300SE

Omniline™

Fan On Demand

Primary Input*	Welding Amperage Range	Rated Welding Output	Rated No Load Voltage (OCV)	Maximum Input Amperage** (Effective Input Amperage)*** 50/60Hz				Consumption at Maximum Output			Dimensions	Weight
				230V	380V/ 400V/ 415V	460V	575V	KVA	KW	EFF		
Single Phase	10-250A	100% Duty Cycle 200A @ 28V 60% Duty Cycle 240A @ 29V 30% Duty Cycle 250A @ 30V	85VDC	45A (30A)	N/A	N/A	N/A	11.5	10.4	80%	Height: 17" (43 cm) Width: 10" (26 cm) Depth: 19" (49 cm)	Net: 70 lb. (31.8 Kg) Ship: 75 lb. (35 Kg)
Single Phase	10-300A	100% Duty Cycle 200A @ 28V 60%Duty Cycle 240A @ 29V 30% Duty Cycle 300A @ 32	85VDC	N/A	N/A	28A (15A)	N/A	12.8	12	80%		
Three Phase	10-300A	100% Duty Cycle 200A @ 28V 60%Duty Cycle 240A @ 29V 30% Duty Cycle 300A @ 32	85VDC	32 (18A)	20A (11A)	16A (9A)	13A (8A)					

*Omniline automatically accepts all primary voltages from 220-632VAC 3Ø. The unit is inoperable when connected to voltages outside this range.
**Input amperage for full rated output @ 30% duty cycle.
***Input amperage for rated output @ 100% duty cycle.
Note: For 230VAC 1Ø maximum output current is limited by input current, not by thermal limitations.

DESCRIPTION OF EQUIPMENT

The PowCon 300SE is a portable welding power source designed primarily for STICK (SMAW) welding and TIG (GTAW) welding. A LiftArc™ starting feature is provided for smooth easy GTAW starts. Arc Force adjustment is provided for SMAW. The 300SE is also capable of performing carbon arc gouging and Flux Cored welding with an appropriate arc voltage sensing wire feeder.

The 300SE is equipped with Fan On Demand, so the cooling fan runs only when needed. This reduces ingestion of dirt, dust, and moisture, which can affect their performance and life of internal electrical parts in sufficient amounts. The 300SE (if provided with the *Omniline*™ input voltage feature) can operate from 230, 240, 380, 400, 415, 460, 480, 500, and 575 volt, Single or Three phase inputs. The *Omniline*™ feature automatically configures itself to the input voltage applied, without operator intervention.

THEORY OF OPERATION

Input power to the 300SE OmniLine is applied through an On/Off switch, S1, located on the front panel. The switch, S1, is a Three Pole Single Throw (3PST) switch. In the "On" position, S1 provides input power to two components, i.e., The Auxiliary Power Board and the Capacitor Filter (CF assembly) board assembly on the OmniLine Version.

The Auxiliary Power board assembly uses this voltage for two functions. The first function is to sample the input voltage and automatically connect the taps of the auxiliary (control) transformer to the appropriate voltage. This happens within the first two to three seconds after the switch is turned "On."

The second function is to provide auxiliary voltage to other components once the changeover on the auxiliary transformer has been completed. These voltages are: 48VAC/24VAC Center Tapped (CT) to the control board assembly, auxiliary AC voltage to the remote connector for use with Wire Feeders or other accessories, and 18VDC to the OmniLine Regulator Circuitry.

The input power provided to the CF assembly is important to pre-charge the DC Link Capacitors. The AC power is being rectified by the CF assembly in the normal means, with one exception. The power is routed through two 50 resistors, which charge the DC Link Capacitors slowly, preventing high inrush currents, that could damage input diodes and DC Link Capacitors, and high voltage spikes, that could damage the IGBT's in the PWM assembly.

Once the Control board assembly receives the correct input power necessary to run the control logic systems and the fan, an Input Contactor Relay energizes, which provides full 3 AC power to the CF assembly, by-passes the 50 resistors.

The CF assembly is considered a Full-Wave Bridge rectifier. The DC voltage (also called the "DC Buss") rectified by the CF assembly can be expressed by the following formula and examples:

Formula:

AC Input Voltage (rms) x 1.414 = DC Buss Voltage

Example:

230VAC x 1.414 = 325VDC

400VAC x 1.414 = 566VDC

The OmniLine Regulator circuit increases the DC Buss voltage to approximately 800VDC. The main advantage using a boost circuit is eliminating voltage changeover links inside the unit, allowing it to be connected to any input AC voltage of 230V, 400V, 460V and 575VAC, 10%.

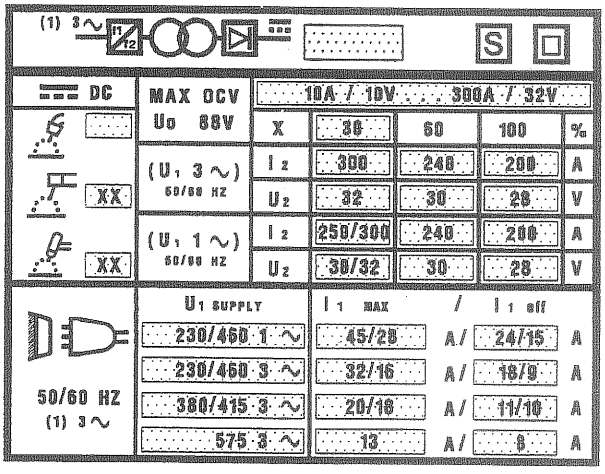


Figure 1 - Power Input and Output

The boost converter regulates the DC Link voltage to 800VDC regardless of the input voltage to the boost converter, which can range from 300VDC to 800VDC.

The DC Link voltage created by the Boost Converter supplies power directly to the main welding converter. This converter is operated using two IGBT's. The IGBT's are turned "On" and "Off" alternately, creating an AC voltage through the Main and 5-P transformers (for clarity, consider these transformers the main transformer, until indicated otherwise) to charge and discharge the working capacitors, which are located on the PWM Driver IGBT board.

The frequency of the inverter remains constant regardless of the output power level the operator requires, operating at a frequency of 32KHz. To vary the output power level of the power source, the inverter changes the "On" time of the IGBT's compared to the "Off" time. The greater the "On" time, the greater the output power level. Likewise, if the IGBT's "On" time decreases, the output power level will also decrease. By controlling the "On" time, we are controlling the Pulse's "Width," hence Pulse Width Modulation.

One advantage of higher frequency alternating current is a significantly reduced main transformer size. The PowCon main transformer size and weight are approximately 6 inches square and 10 pounds, compared to a conventional power source's main transformer, ranging up to 2 feet square and weighing 200 pounds. The main transformer takes the higher voltage, low current power from the IGBT's on the primary and transforms it to a lower voltage, high current power on the secondary appropriate for welding processes.

The secondary AC voltage of the main and 5-P transformers are rectified by 4 diodes, two for the main transformer carrying 95 percent of the output welding current, and two for the 5-P transformer carrying the remaining 5 percent of the welding output current. The output rectifier is considered a half bridge rectifier, using the center tap of the main and 5-P transformers as the negative output jack. After the output rectifier, the output current is filtered (smoothed) by an inductor (with an additional winding on it to provide timing feedback to the control board) and the voltage is filtered by Resistor/Capacitor (RC) networks. For current feedback used in current regulation of the welding output and proper pulsed width modulation (PWM) of the IGBT's, there are two current transformers mounted on the secondary leads of the main and 5-P transformers.

The complete sequence of operation is regulated by the main control board through control logic feedback. Additionally, the main control board regulates the amount of time the fan is on. The main control board allows the fan to run when initial power is applied, eliminating moisture which could have accumulated overnight, for example, and while welding, preventing a considerable amount of metal dust, dirt, etc., from entering the power source. The fan's "On" time directly depends on welding time and output settings.

INSTALLATION

UNPACKING NEW EQUIPMENT

(Receiving and Handling)

Remove the PowCon Welding Power Source from its shipping carton and inspect for any possible damage that might have occurred during shipping. Make sure that all items on the packing list are accounted for and identified. One copy of the PowCon 300SE Operation Manual is packed with each PowCon 300SE unit.

Any claims for loss or damage that may have occurred in transit must be filed by the PURCHASER with the CARRIER. Copies of the bill of lading and freight bill will be furnished by the carrier on request, if the need to file a claim arises. When requesting information concerning this equipment, it is essential that model description, serial number and/or part number of the equipment be supplied.

NOTE

To assure a valid warranty, you MUST complete and return the warranty card (enclosed with all products) within 10 days of the purchase date.

EQUIPMENT INSTALLATION

Input Power Requirements

The primary cable supplied with the power source has four conductors. When connecting an attachment plug or hard-wiring to an electrical service box, connect the green/yellow wire to the GROUND or the protective earth connector. The other three conductors can be connected to the phases in any order.

For Single Phase operation do not connect the blue wire. Simply tie it back and insulate from all else. (See Figure 5)

NOTE

Always make the installation in accordance with your plant regulations and applicable electrical code.

FUSE SIZE

Table 1 - Recommended Fuse Size*

Input Voltage	Continuous Amperage	Recommended Fuse Capacity
230,1ø	30A	60A
230, 3ø	18A	50A
380, 400,415, 3ø	11A	30A
460, 1ø	15A	40A
460, 3ø	9A	30A
575, 3ø	8A	20A

*Continous current demand is based on an output of 28VDC and 200 amps for 3 phase input.

WARNING

Do not allow the unit to remain operating when lifting or moving it. Do not drag or lift the unit by primary or secondary cable.

DANGER

Exercise care in the handling of primary and secondary cable to avoid wearing out or loss of electrical insulation.

Do not lift the unit unless all 10 flange screws and nuts holding the top and bottom cases are tight.

NOTE

Locate the PowCon unit so the airflow into the front and out of the back of the unit is not obstructed.

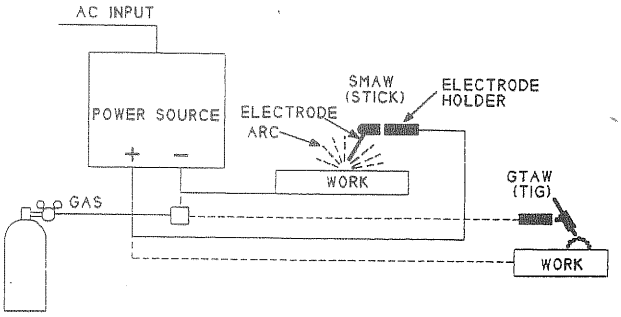


Figure 2 - Typical SMAW/GTAW Set Up



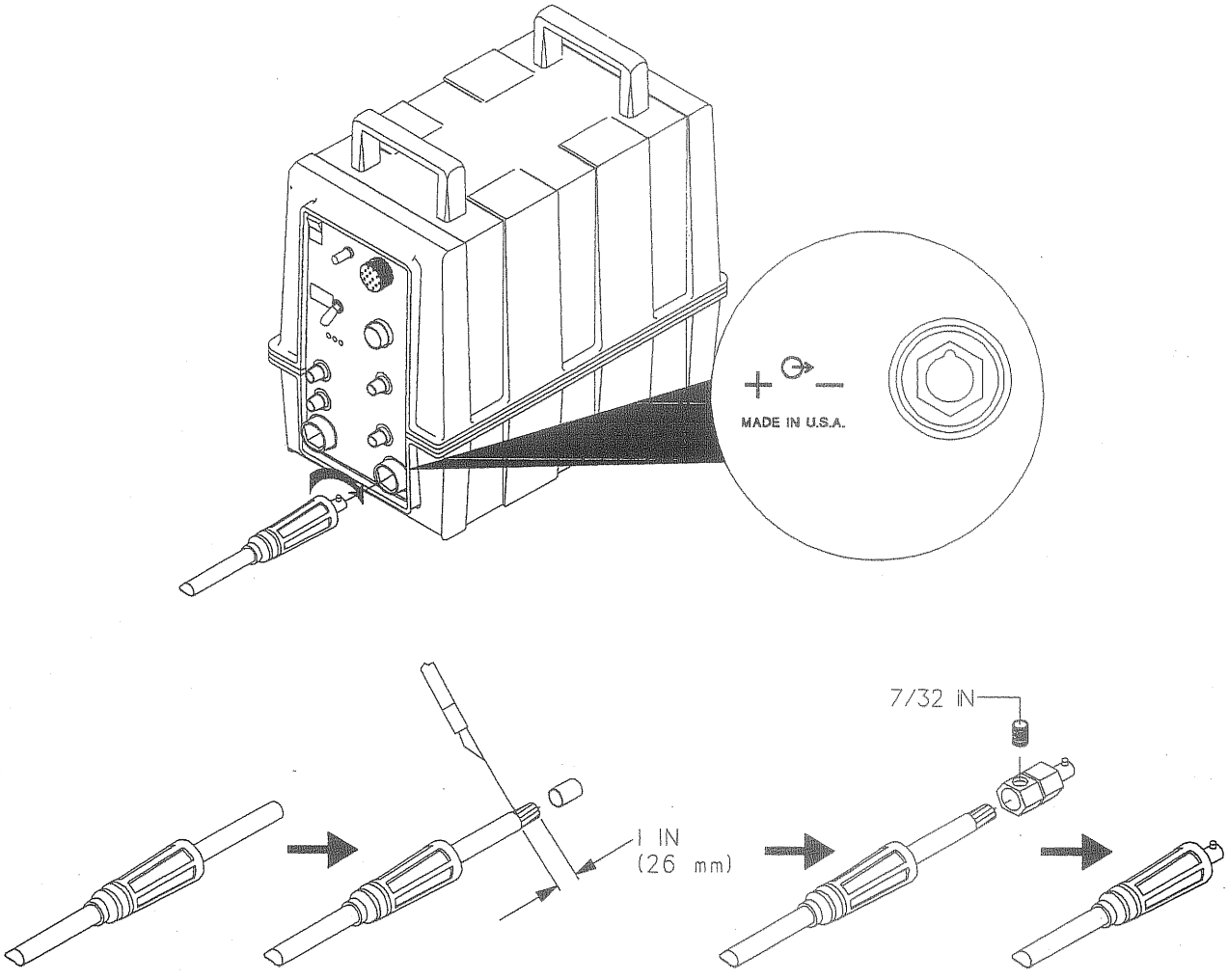


Figure 3 - Weld Output Connections

OPERATION

FUNCTION OF OPERATING CONTROLS AND CONNECTIONS

(See Figure 4)

1> **Power Switch**

2> **Weld Process Switch**

3 & 4> **Weld output Connectors (+) and (-)**

5> **Output Amperage Adjustment**

6> **Arc Force Adjustment**

7> **Remote or Panel Output amperage control selector switch (optional)**

8> **Contactor Control Switch (optional)**

9> **Power On Indicator LED**

10> **Contactor On Indicator LED**

11> **Over Temperature Indicator LED**

12> **Digital Volt/Amp Meter (optional)**

13> **Volt/Amp Meter Selector Switch**

14> **Remote Control Connector (optional)**

15> **Auxiliary Circuit Breaker (optional)**

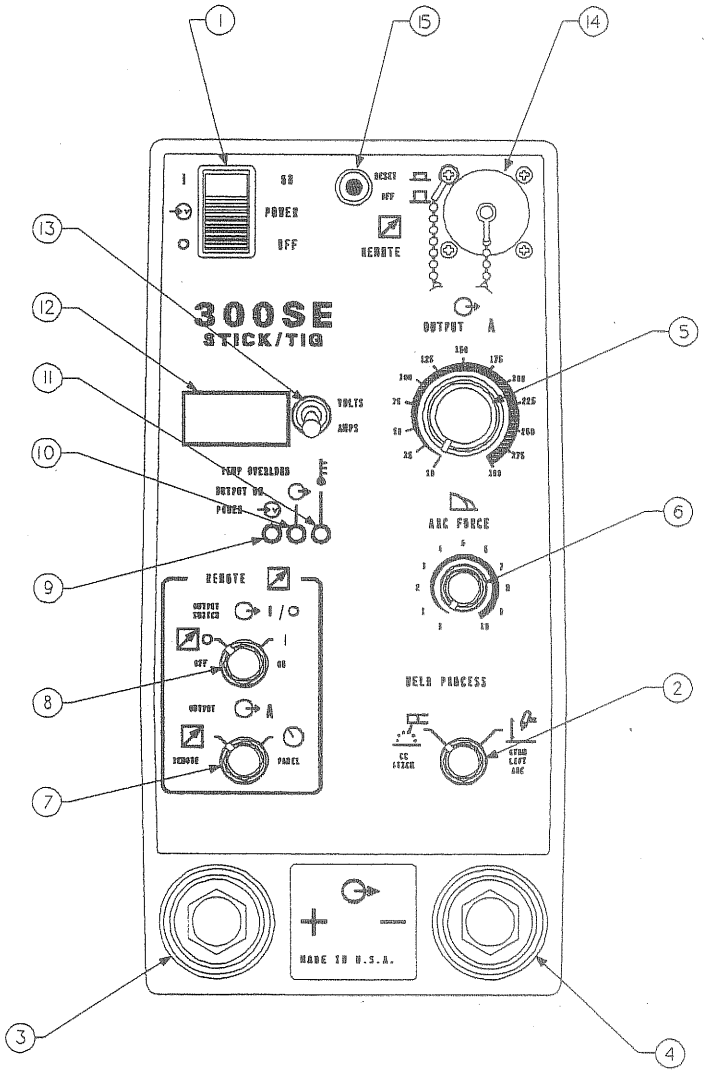


Figure 4 - Front Panel Controls and Connections

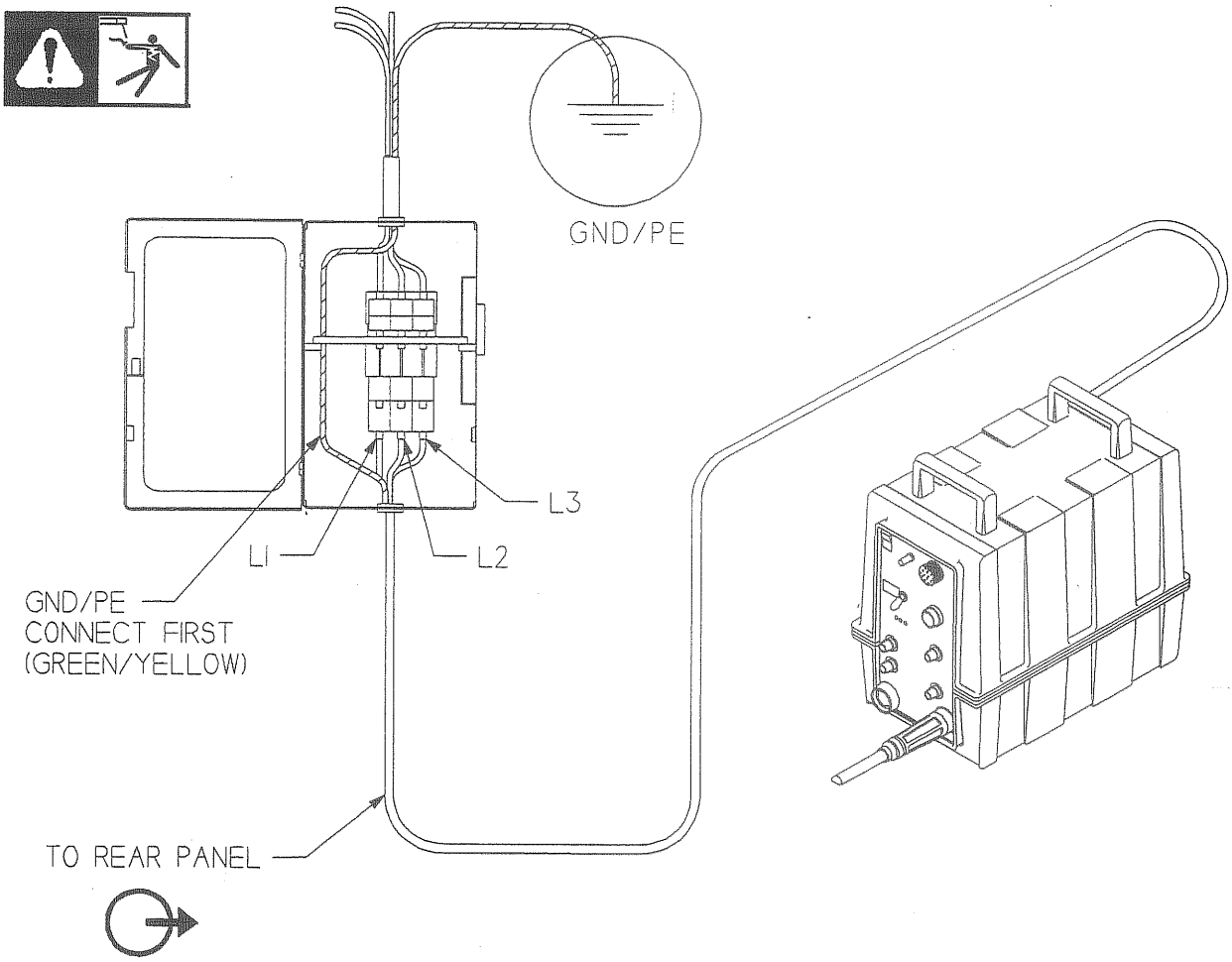


Figure 5 -Connecting Input Power

	Tig Welding		Arc Force		Stick Welding	F	Temperature
	Output	~	Alternating Current	⎓	Direct Current	I	On
+	Positive	−	Negative		LiftArc TIG		Input
A	Amperes	O	Off	3Ø	Three Phase Power Source	1Ø	Single Phase Power Source
	Amperage Control/ Panel				Remote	V	Volts
U_0	Rated No Load Voltage (Average)	U_2	Conventional Load Voltage	X	Duty Cycle	I_{1eff}	Maximum Effective Supply Current
I_{1max}	Rated Maximum Supply Current	I_2	Rated Welding Current	IP	Degree Of Protection		

Figure 6 - Symbols and Definitions

PARTS LIST

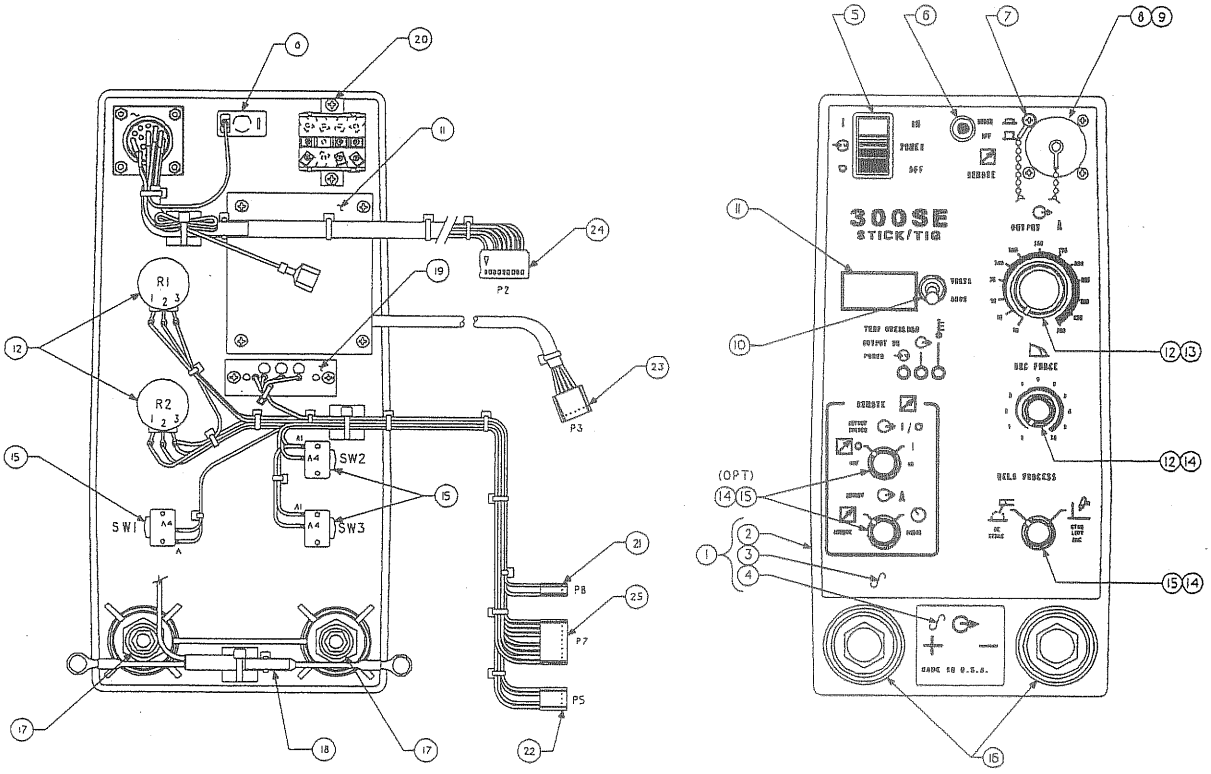


Figure 8 - Front Panel

Parts List, Front Panel

Item No.	Qty.	101302-xxx Omniline™ (CE) Part Number	Description	Ref. Des.
1	1	101343-001	Front Panel Overlay Assembly	
Consisting of:				
2	1	101344-001	300SE Front Panel, Blk	
3	1	101379-001	Overlay, Front Panel 300SE	
4	1	101383-001	Overlay, Positive & Negative	
5	1	920005-002	Switch, Rocker, 3 Position Single Pole, 600V, 6 Amp	S1
6 (Opt)	1	921013-002	Circuit Breaker, 10A	CB1
7 (Opt)	4	970002-206	Screw, 4-40 X .50	
8 (Opt)	1	930014-502	Sealing Cap	
9 (Opt)	1	101319-002	Remote Connector Assembly	
10 (Opt)	1	920004-002	Swtich, DPDT, Toggle, On-None-On	
11 (Opt)	1	600020-001	Digital Volt/Amp Meter	
12	2	903000-005	Potentiometer, 10K Single Turn	R1, 2
13	1	940024-101	Knob, Large, Skirted, Black/Gray	
14	4	940024-001	Knob, Small, Skirted, Black/.Gray	
15	3	920019-003	Switch, Rotary, 1 pole, 2 Position	SW1, 2, 3
16	2	100025-001	Output Connector, Tweco	
16 (Opt)	2	100028-001	Output Connector, Dinse	
17	1	250002-001	Output Connector Hardware Kit	
18	1	101380-001	Capacitor Filter Assembly	
19	1	107088-002	LED Board Assembly	
20	8	970025-304	Screw, 6-10 X 3/8"	
21	1	930002-011	Connector Housing, 3 Pin	P8
22	1	930002-013	Connector Housing, 5Pin	P5
23	1	930002-014	Connector Housing, 7 Pin	P3
24	1	930002-016	Connector Housing, 9 Pin	P2
25	1	930002-017	Connector Housing, 10 Pin	P7

PARTS LIST

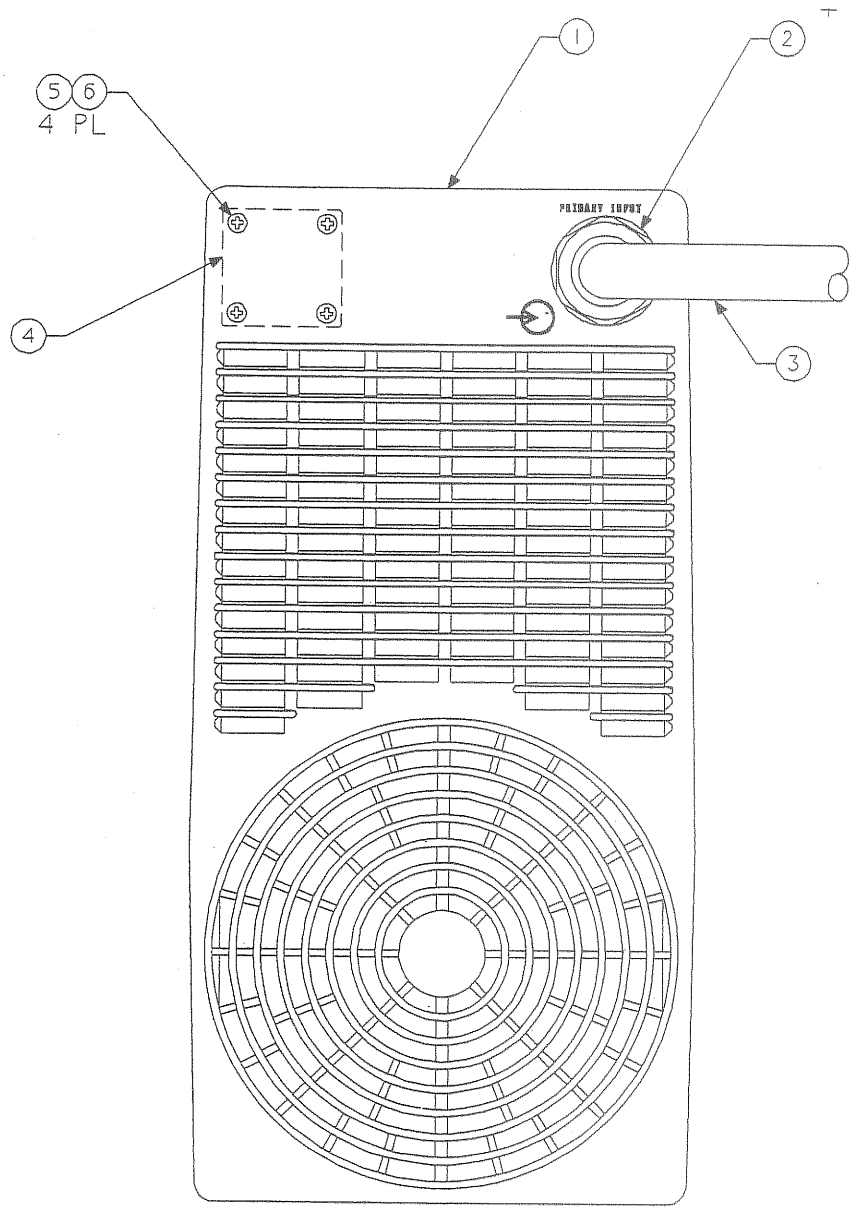


Figure 9 - Rear Panel

Item No.	Qty.	101302-xxx Omniline™ (CE) Part Number	Description	Ref. Des.
1	1	101346-001	Rear Panel, Silkscreened	
2	1	940015-003	Strain Relief with Nut	
3	1	100156-009	Power Cord Assembly, 13' 6"	
4	1	107600-001	Remote Cover Plate	
5	4	970000-204	Screw, 4-40 X 3/8"	
6	4	972007-002	Nut, 4-40	

PARTS LIST

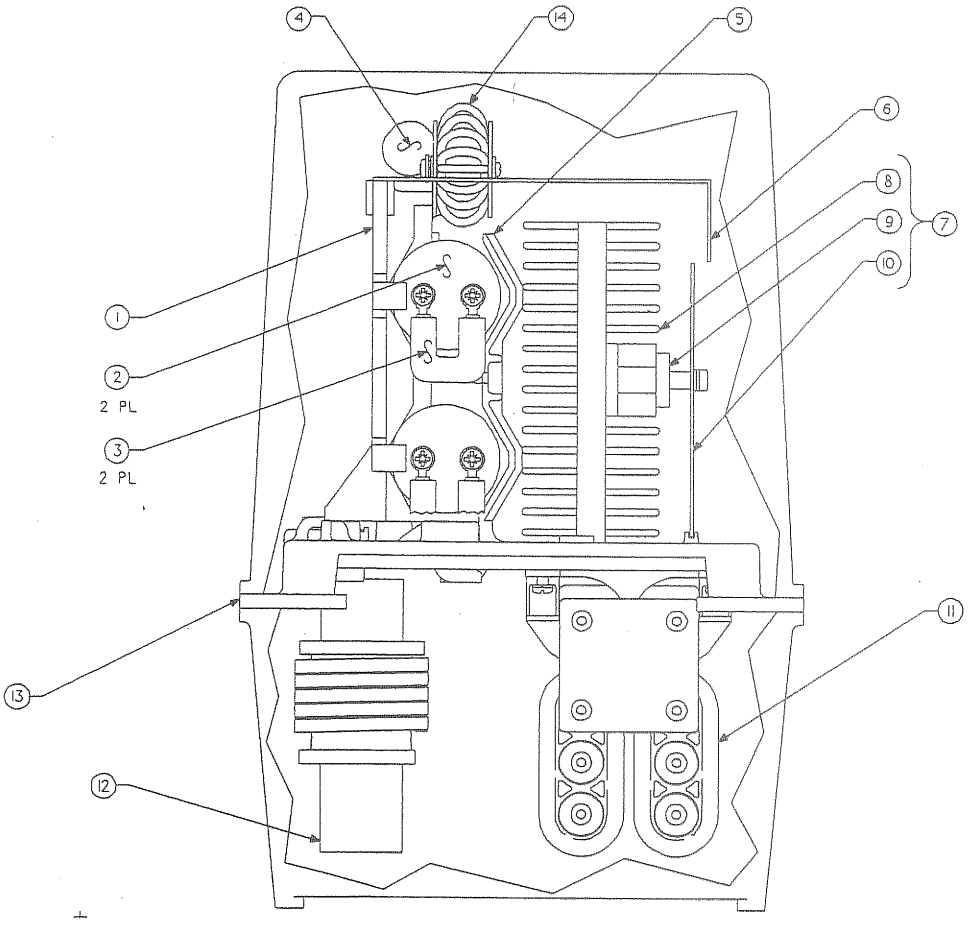


Figure 10 - Front View

Item No.	Qty.	101302-xxx Omniline™ (CE) Part Number	Description	Ref. Des.
1	1	101341-001	Mount, Capacitor/CF	
2	2	900000-001	Capacitor, DC Link/Buss, 800uf 400V	
3	2	104095-002	Bleeder Resistor Assembly	
4	1	901001-013	Capacitor 2*uF* 1000 VDC	
5	1	100167-001	Capacitor Clamp	
6	1	101397-001	Air Deflector	
7	1	101326-001	Boost IGBT, PWB Assembly	
Consisting of:				
8	1	101334-001	Heatsink, IGBT, Machined	
9	1	101374-002	Boost IGBT Module Assembly	
10	1	101356-001	Boost Control PWB	
11	1	101349-003	Main Transformer Assembly	
12	1	101314-001	Output Inductor Assembly	
13	1	101340-001	Chassis Plate	
14		101618-001	Assembly, Toroid	

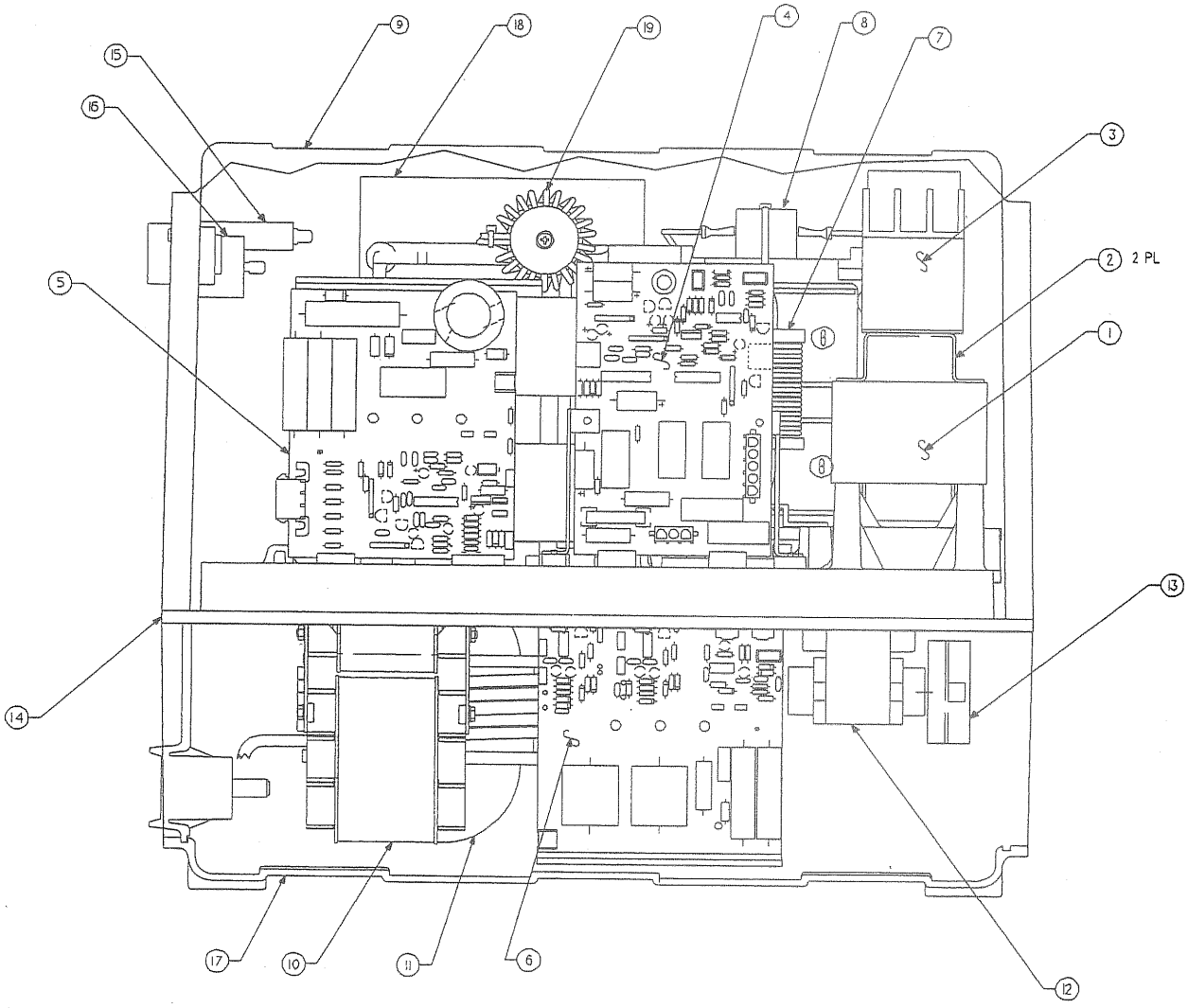


Figure 11 - Right Side View

PARTS LIST

Parts List, Right Side View

Item	Qty.	101302-xxx Omniline™ (CE) Part Number	Description	Ref. Des.
1	1	101371-002	Auxiliary Transformer	
2	2	101342-001	Contactor Mount	
3	1	923025-001	Contactor, 40A, 24VAC Coil	
4	1	101320-002	PWB, Auxiliary Power Assembly	
5	1	101356-001	PWB, Control Boost, IGBT Assembly	
6	1	101350-001	PWB, PWM IGBT Driver Assembly	
7	1	101327-002	Boost Inductor	
8	1	901001-013	Capacitor 2*uF* 1000 VDC	
9	1	100007-001	Top Case	
10	1	101349-003	Main Transformer Assembly	
11	1	101314-001	Output Inductor	
12	1	101313-001	Fan Motor Assembly	
13	1	922001-004	Fan Blade, 6.25"	
14	1	101340-001	Chassis Plate	
15	1	921013-002	Circuit Breaker, 10A	CB1
16	1	920005-002	Switch, Rocker, 3 Position Single Pole, 600V, 6 Amp	S1
17	1	100006-001	Bottom Case	
18	1	101606-002	PWB, Control 300SE Assembly	
19	1	101618-001	Assembly, Toroid	

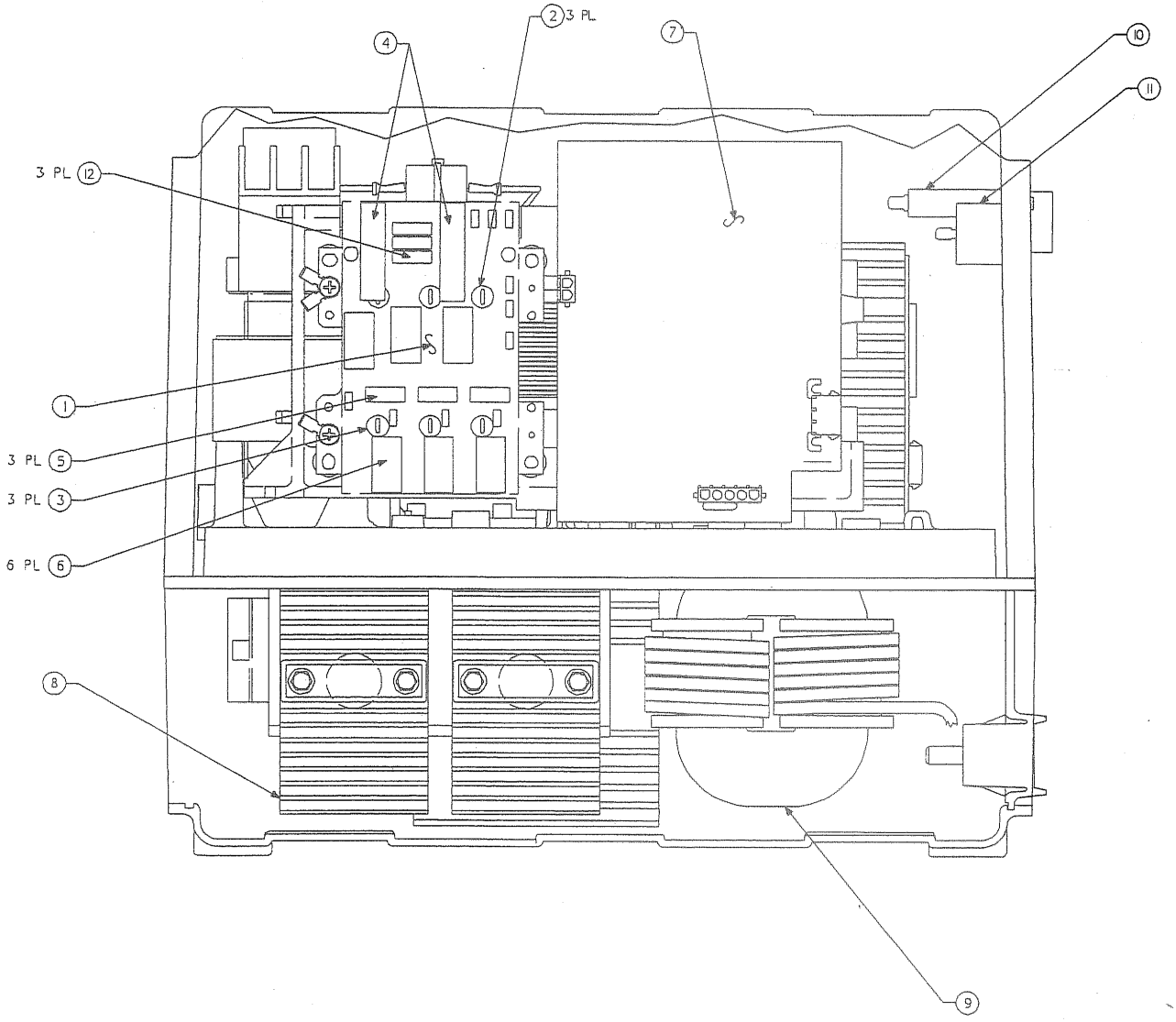


Figure 12 - Left Side View

PARTS LIST

Parts List, Left Side View

Item	Qty.	101302-xxx Omniline™ (CE) Part Number	Description	Ref. Des.
1	1	101610-002	PWB, Capacitor Filter Assembly	
Consisting of:				
2	3	912005-002	Input Diode, Cathode Stud	CR4-6
3	3	912005-001	Input Diode, Anode Stud	CR1-3
4	2	902015-003	Resistor, Power, Wire Wound, 50 ohm, 20W	R1-2
5	3	902011-008	Varistor	RV1-3
6	6	901003-104	Capacitor, Metal Polyester	C1-4, C6-7
7	1	101606-002	PWB, Control 300SE Assembly	
8	1	101324-001	Output Diode Heatsink Assembly	
9	1	101314-001	Output Inductor	
10	1	921013-002	Circuit Breaker	CB1
11	1	920005-002	Switch Rocker, 3 Position Single Pole, 5\600V, 6 Amp	S1
12	3	902011-008	Varistor	RV4-6

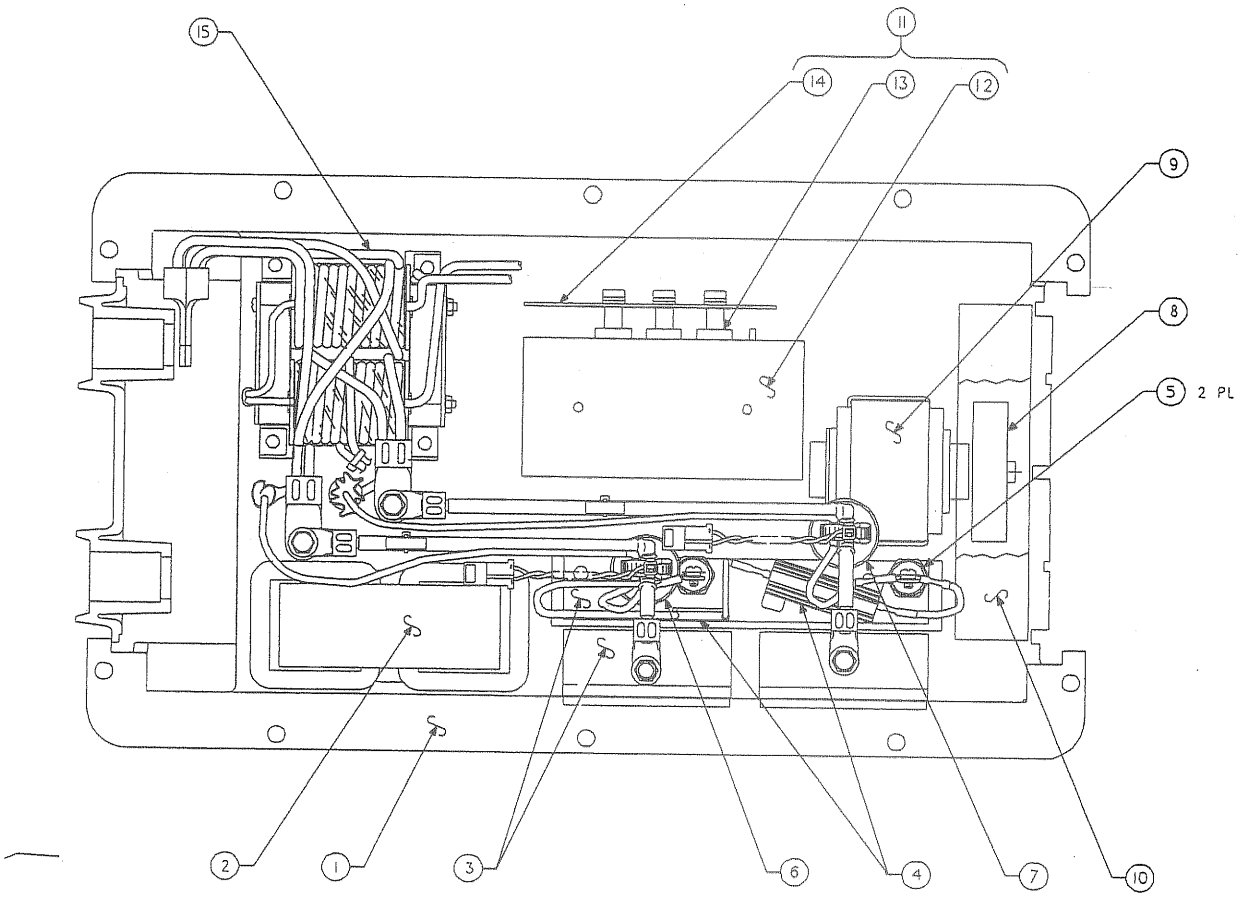


Figure 13 - Bottom View

PARTS LIST

Parts List, Bottom View

Item	Qty.	101302-xxx Omniline™ (CE) Part Number	Description	Ref. Des.
1	1	101340-001	Chassis Plate 300SE	
2	1	101314-001	Output Inductor	
3	1	101324-001	Output Diode Heatsink Assembly	
Consisting of:				
4	1	101369-001	Resistor/Capacitor Assembly	
5	2	913013-002	Diode, 5P Winding	
6	1	101312-001	Current, Sensor, 6" Wire	
7	1	101312-002	Current, Sensor, 8" Wire	
8	1	922001-004	Fan Blade, 6.25"	
9	1	101313-001	Fan Motor Assembly	
10	1	101361-001	Fan Shroud	
11	1	101325-001	PWM, IGBT Driver PWB Assembly	
Consisting of:				
12	1	101334-001	PWM IGBT Heatsink, Machined	
13	1	101374-001	PWM IGBT Module Assembly	
14	1	101350-001	PWB, PWM IGBT Driver Assembly	
15	1	101349-003	Main Transformer Assembly	

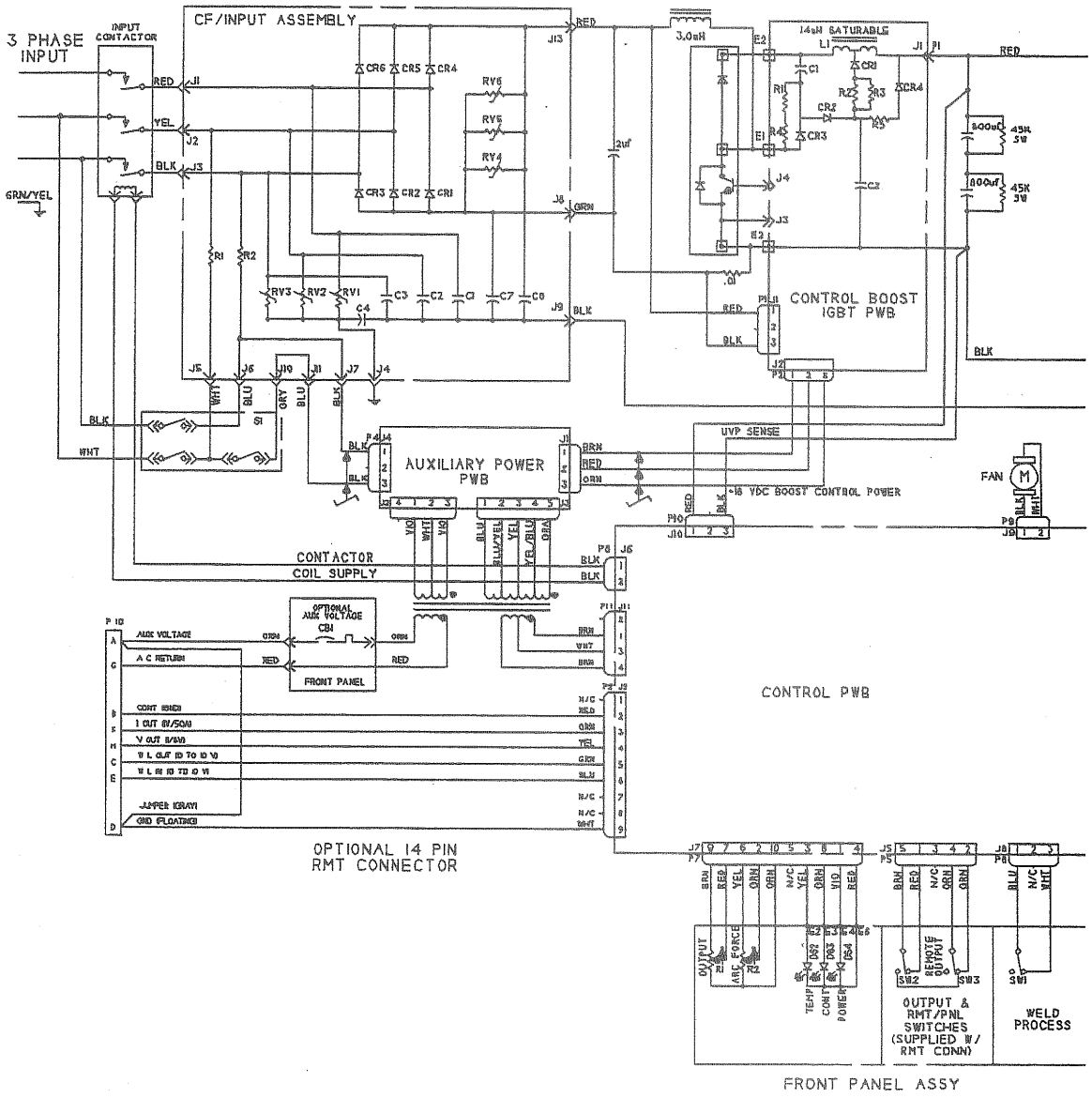
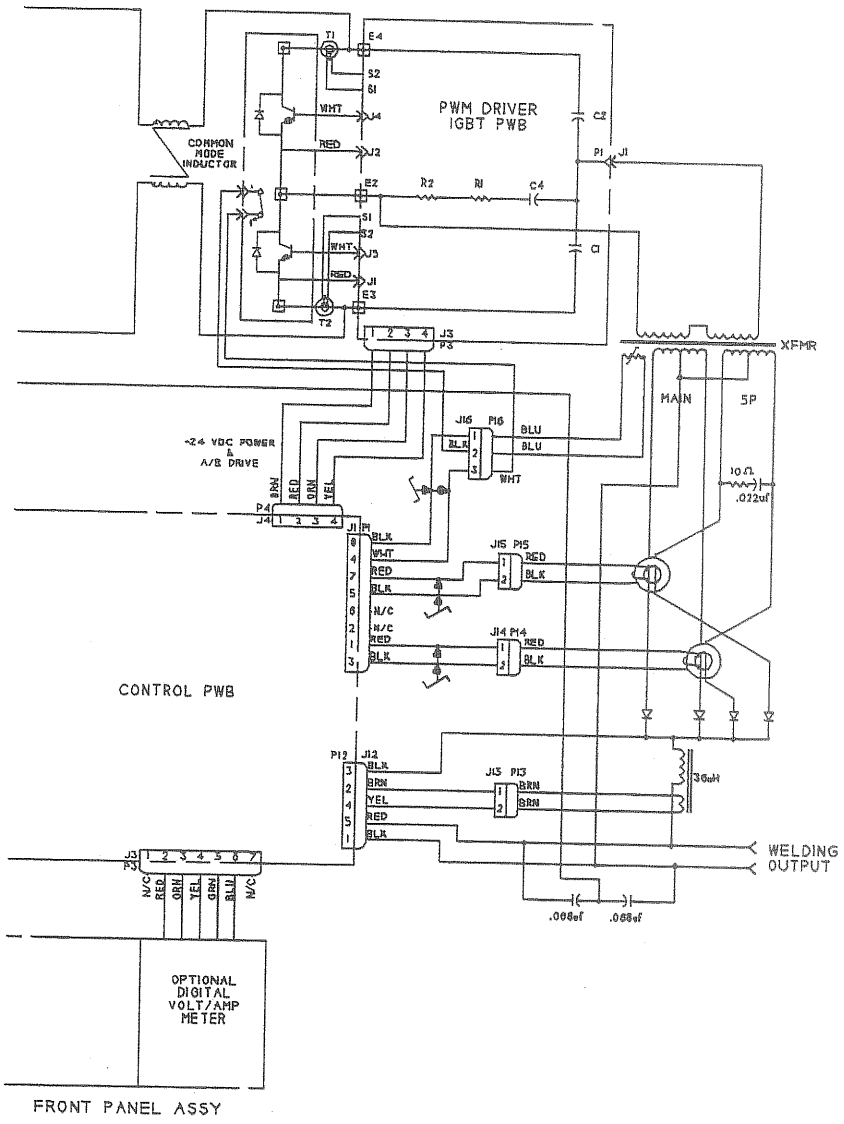


Figure 14 - 300SE Omniline CE P/N 101302-XXX

PARTS LIST


PWM DRIVER
IGBT PWB
COMMON MODE INDUCTOR
CONTROL PWB
XFMR
MAIN
5P
WELDING OUTPUT
-24 VDC POWER & A/B DRIVE
OPTIONAL DIGITAL VOLT/AMP METER
FRONT PANEL ASSY

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP