

SOFT TOUCH for AMADA WELDERS

ID40-ST, ID40IV-ST, AND ID40IV-HPNT



UNITROL ELECTRONICS, INC.
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Thank you for purchasing this Unitrol SOFT TOUCH system. It is designed to protect your resistance welder operator from serious electrode pinch point injury. Please let us know if there are any questions or problems with the installation or use of this product. You can contact us:

By Phone:

Monday - Friday 9:00 - 5:00 CT: 847-480-0115.

By Email:

techsupport@unitrol-electronics.com

By Regular Mail:

Unitrol Electronics, Inc.

Technical Support

702 Landwehr Road

Northbrook, Illinois 60062

MODEL NUMBER 9181-34WPM/115

This **SOFT TOUCH** system is designed to operate Amada welders model as selected in the first two options below.

SERIAL NUMBER:

OPTIONS		
	9181-34AM-ID40ST	Circuitry designed to operate Amada ID40ST welder.
	9181-34AM-ID40IVST	Circuitry designed to operate Amada ID40IVST and ID40IVHPNT welder.
	9181-34BPA	Timed bypass. Includes security lock selector switch, 2 = LED indicator lights, faceplate. Closes electrodes under low force, delays, and brings electrodes to welding force.
	9181-34JA	Retract Kit. Includes HEAD DOWN proximity switch and mounting bracket kit. May require additional field bracketry to match welder
	9181-34JB	Retract option without proximity switch. For use with welders that have separate RETRACT and WELD INITIATION switches.
	9181-34LSA	Limit Switch. Allows use of ram position or continuity. Includes RAM POSITION proximity switch and mounting bracket kit. May require additional field bracketry to match welder. Includes security lock selector switch, 2 = LED indicator lights, faceplate
	9181-34LSB	Limit Switch. Allows use of a ram position or continuity. Includes security lock selector switch, 2 = LED indicator lights, faceplate. Does NOT include a proximity switch or mounting bracket kit. Use with customer-supplied PNP proximity switch.
	9181-34LSC	Limit Switch used as a redundancy with continuity. Always in operation and not keylock selected. Includes RAM POSITON proximity switch and mounting bracket kit. May require additional field bracketry to match welder. Can be turned off by moving a jumper on the control board inside the locked cabinet.

WARRANTY

Unitrol Electronics provides a 5-year limited warranty to cover all of this SOFT TOUCH system. The warranty periods are determined using the date the new control was originally shipped from Unitrol Electronics. All warranty coverage is FOB Northbrook, Illinois.

This warranty, except for exclusions shown herein covers the following items:

DURING YEAR #1: All parts (exclusive of fuses) that fail due to manufacturing defects. Necessary labor to repair control that has failed due to manufacturing defects.

DURING YEAR #2: 80% cost of all parts (exclusive of fuses).

80% cost of necessary labor to repair control that has failed due to manufacturing defects.

DURING YEAR #3: 60% cost of all parts (exclusive of fuses).

60% cost of necessary labor to repair control that has failed due to manufacturing defects.

DURING YEAR #4: 40% cost of all parts (exclusive of fuses).

40% cost of necessary labor to repair control that has failed due to manufacturing defects.

DURING YEAR #5:

20% cost of all parts (exclusive of fuses).

20% cost of necessary labor to repair control that has failed due to manufacturing defects.

EXCLUSIONS TO WARRANTY

Any expense involved with repair of control by other than Unitrol Electronics personnel that has not been authorized in advance and in writing by an officer of Unitrol Electronics.

All costs for freight, to and from Unitrol Electronics, are excluded from this warranty

All field service labor, travel expense, and field living expenses associated with field service are excluded from this warranty.

No coverage, parts or labor, is offered for components that have failed on control **not** being used as specified in Unitrol Electronics published literature, technical sheets, and this direction book.

No warranty coverage will be made on controls that are being used contrary to specifications, that were mechanically or electronically altered by customer or installer, or that were physically damaged after shipment from Unitrol Electronics.

Damages to a control by lightning, flood, or mechanical damage are excluded from this warranty.

Unitrol Electronics assumes no liability for damage to other equipment or injury to personnel due to a failure in the Unitrol Electronics control.

Unitrol Electronics shall not be responsible for any consequential damages of whatever kind.

Expenses involving alteration or installation of a Unitrol Electronics control are not covered in this warranty.

NO OTHER UNITROL ELECTRONICS INC. WARRANTY, WRITTEN OR IMPLIED, COVERS THIS CONTROL UNLESS IN WRITING AND SIGNED BY AN OFFICER OF UNITROL ELECTRONICS, INC. PRIOR TO SHIPMENT OF PRODUCT.

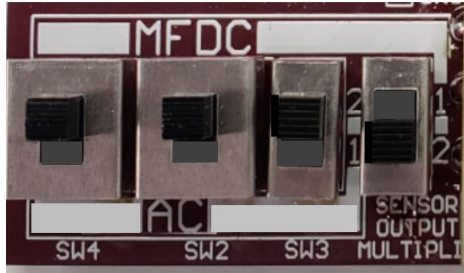
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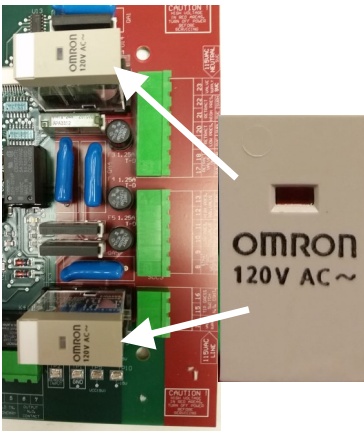
VERIFY YOUR SOFT TOUCH SENSOR BOARD IS CORRECT

The SOFT TOUCH sensor board can be configured in several ways. Before turning power on, check to be sure that the mode and valve voltage matches your welder.

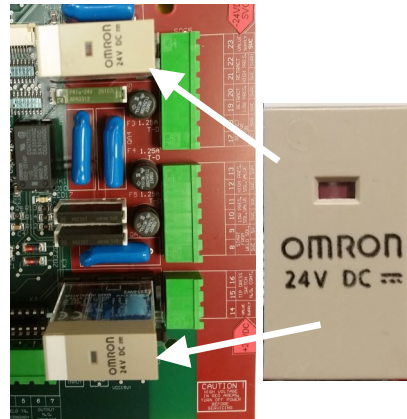
TYPE OF WELDING CONTROL. This board can be set to operate either a 1ØAC welder or an MFDC (inverter) welder. For the **Amada welder**, be sure it is set up as shown below to operate an **MFDC welder**. This is done by pushing the four switches on the lower left corner to a position to match the photo below.



2. SOLENOID VALVE VOLTAGE. Be sure that the two tall relays, K2 and K3, show the same voltage on the top printing as the solenoid voltage of your welding control. If they are not correct, contact Unitrol to swap relays.



FOR 115VAC



FOR 24VDC

SOFT TOUCH PINCH POINT PROTECTION SYSTEM FOR INSTALLATION ON NON-UNITROL 1Ø AC and MFDC WELDING CONTROLS

HOW THE SYSTEM OPERATES

When the solenoid valve output from the welding control goes HIGH, this voltage goes to the 9280-TS7 SOFT TOUCH detection board, terminal #9.

The output terminal #11 (SVL) goes HIGH to turn on solenoid valve SVL.

For 9181-34WB systems, this closes the welding electrodes under gravity force with low force bucking pressure (BALANCE) acting on the underside of the cylinder piston to counterbalance part of the ram dead weight.

For 9181-34YB systems, this closes the welding electrodes under low force (CLOSE) using low air pressure on the forward port of the welder cylinder.

The 9280-TS7 board checks input at terminals #4 and #5 to see if the voltage signal drops a minimum value indicating that the electrodes have made contact on a conducting material (continuity detected).

If this contact is NOT sensed within the maximum time setting on the board's DIPswitches, the output terminal #11 (SVL) will go LOW and drop out solenoid valve SVL to open the electrodes.

If this contact is IS sensed within the maximum time setting:

Terminal #11 (SVL) will continue to be HIGH

Terminal #13 (SVH) will go HIGH

Solenoid valve SVH will be turned ON to start high electrode pressure, and relay K4 on this board will close to start the welding sequence

The contact across terminals #6 and #7 on the TS2 board close to tell the welding control to start the welding sequence.

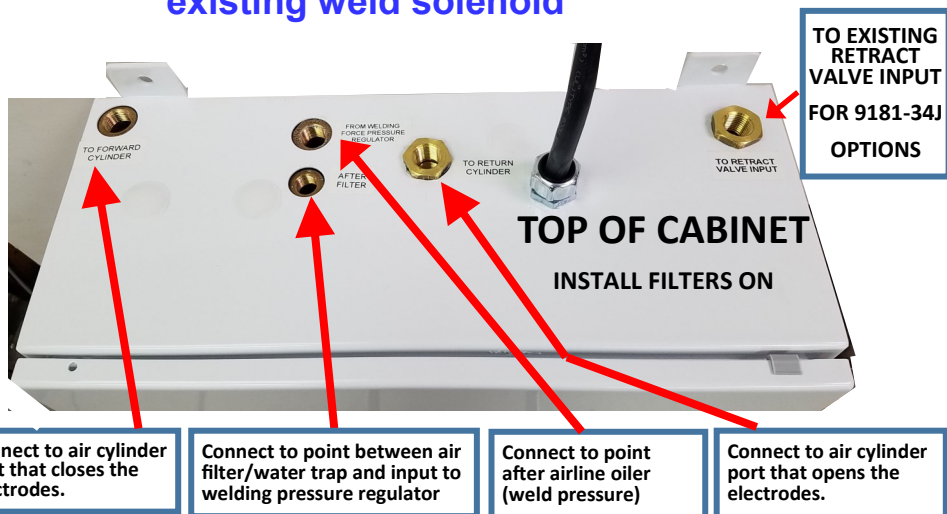
INSTALLATION

Note that this system REPLACES the existing weld solenoid valve.

1. Mount the control in a convenient location using the four mounting tabs on the back of the box.
2. Remove hoses from the existing welding solenoid valve. This solenoid valve will not be used with this control.
3. Connect hoses from the control to the air cylinder as shown in the photos below and the next page. Choose the photo that matches your control model.

HOSE CONNECTION FOR 9181-34W SERIES CONTROL

Note that this system REPLACES the existing weld solenoid



WIRING CONTROL

CONNECTING SIGNAL PICKUP WIRES

1. Connect the **two blue wires** from the bottom of the box to the upper and lower secondary pad on the welding transformer or any point close to the pad. See photos below for suggested areas for various types of welders.
2. **CRITICAL:** Be sure that the place under the connection is clean of oxide or dirt. Connection must be tight.



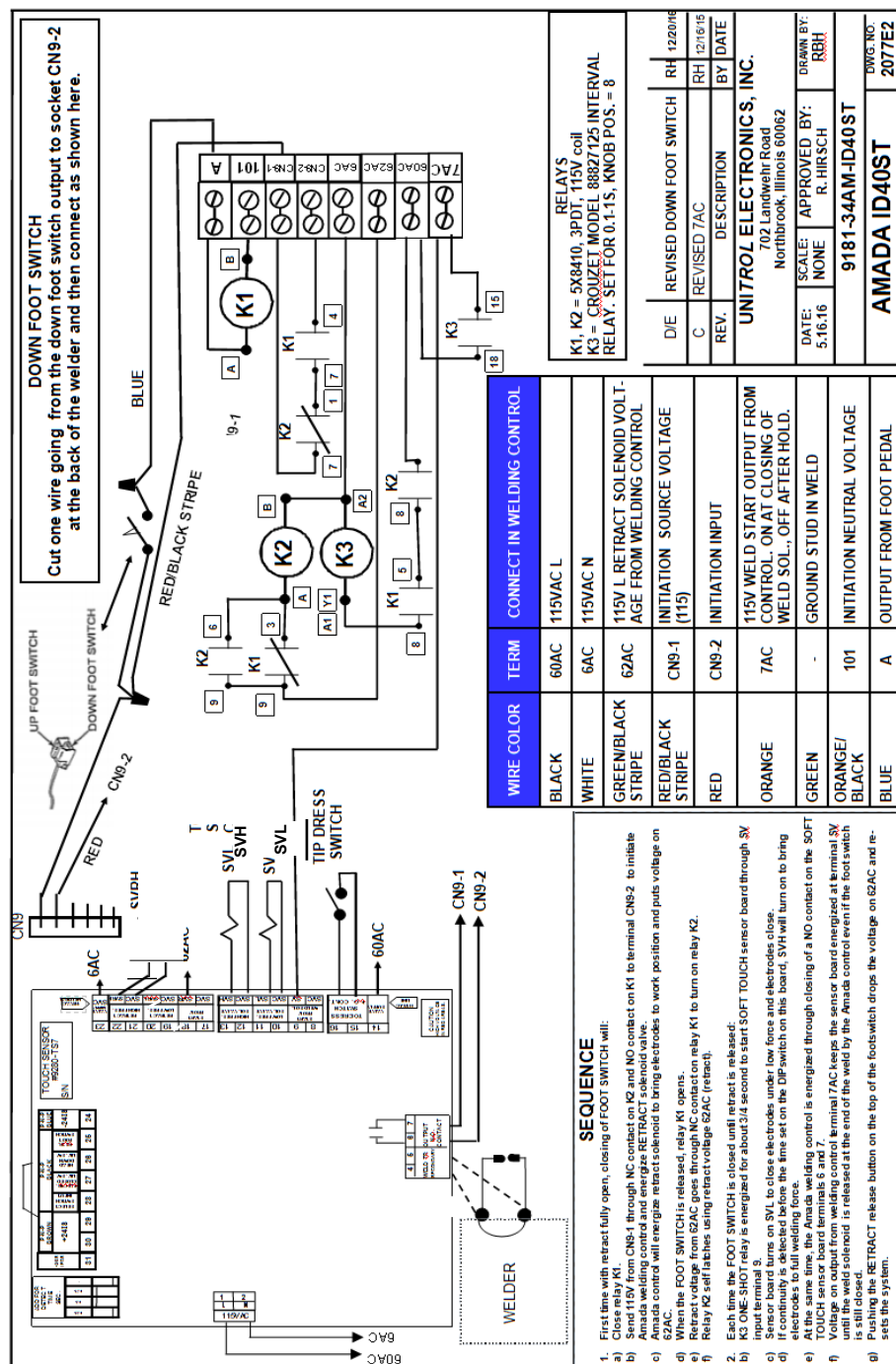
WIRING CONTROL

(CONTINUED)

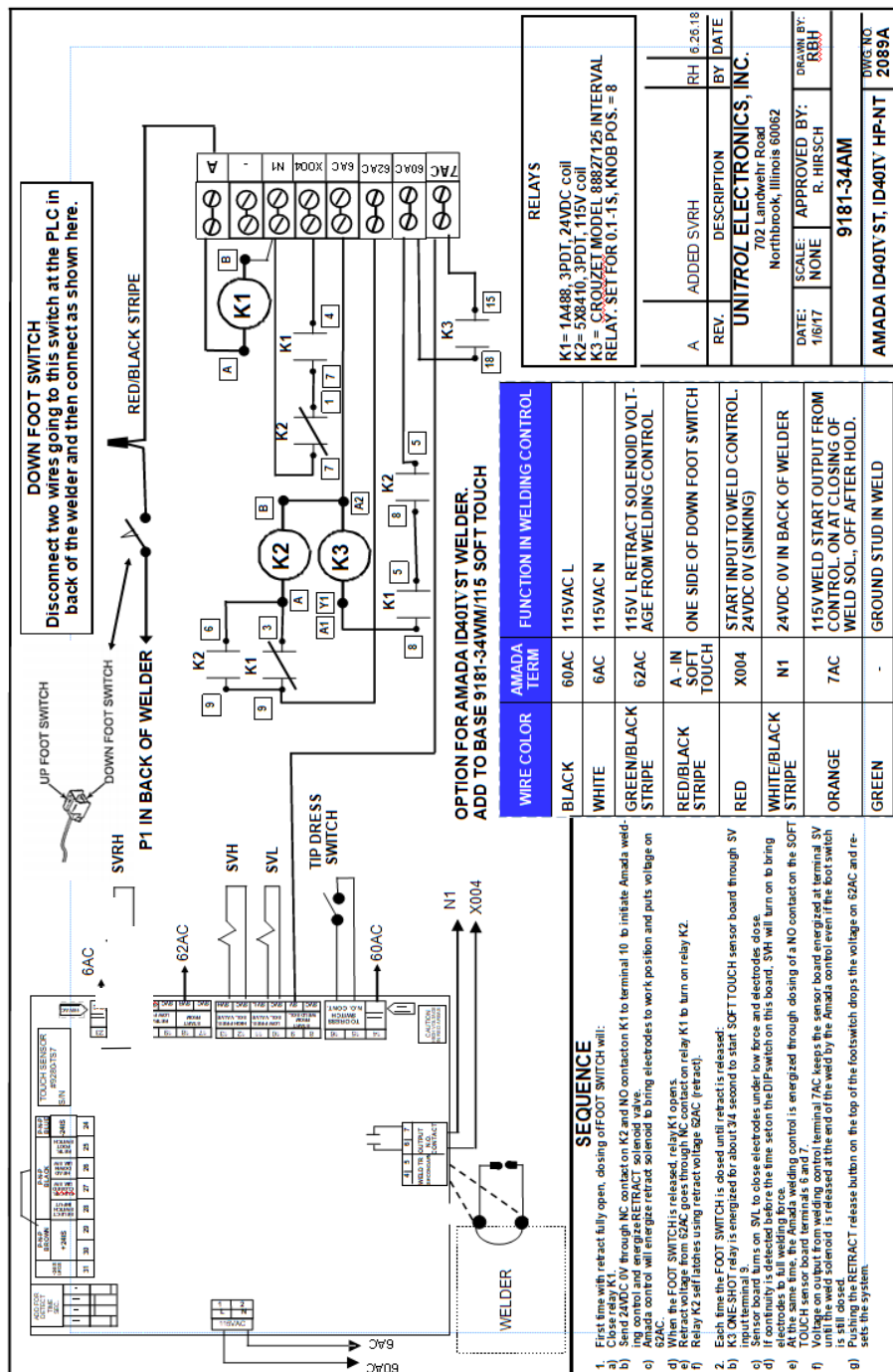
CONNECTING CONTROL CABLE

3. Route the black multi-wire cable from the top of the SOFT TOUCH enclosure to the welding control.
4. Install the supplied strain relief fitting in a 7/8" diameter hole in the welding control and bring cable into the control.
5. Trim the cable to allow it to reach the terminals shown in the table on the next pages.
6. FOR AMADA MODEL **ID40ST**, connect the wires in this cable per drawing on page 6.
7. FOR AMADA MODEL **ID40IVST**, connect the wires in this cable per drawing on page 7.

HOOKUP FOR AMADA ID40ST WELDING CONTROLS

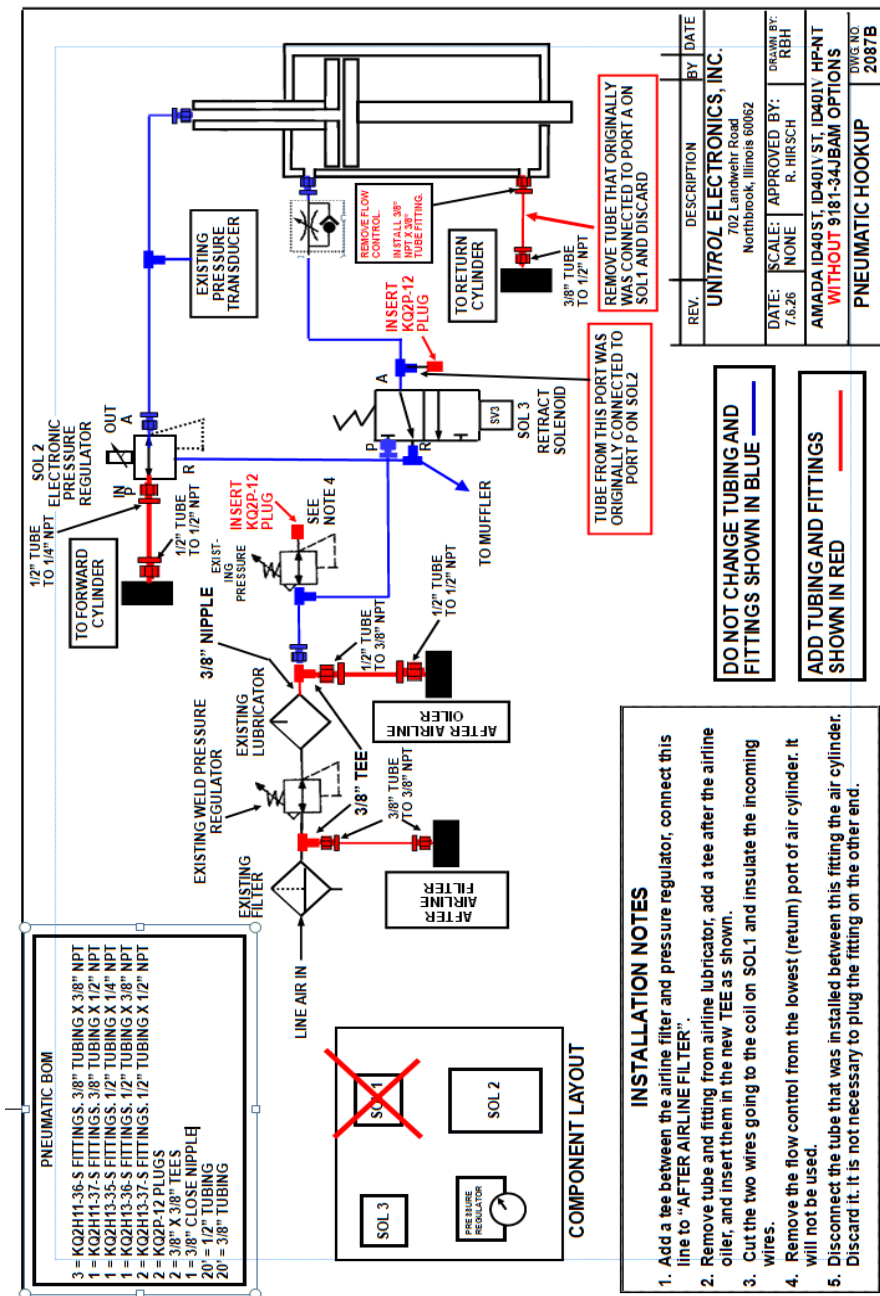


ELECTRICAL HOOKUP FOR ID40IV WELDING CONTROLS

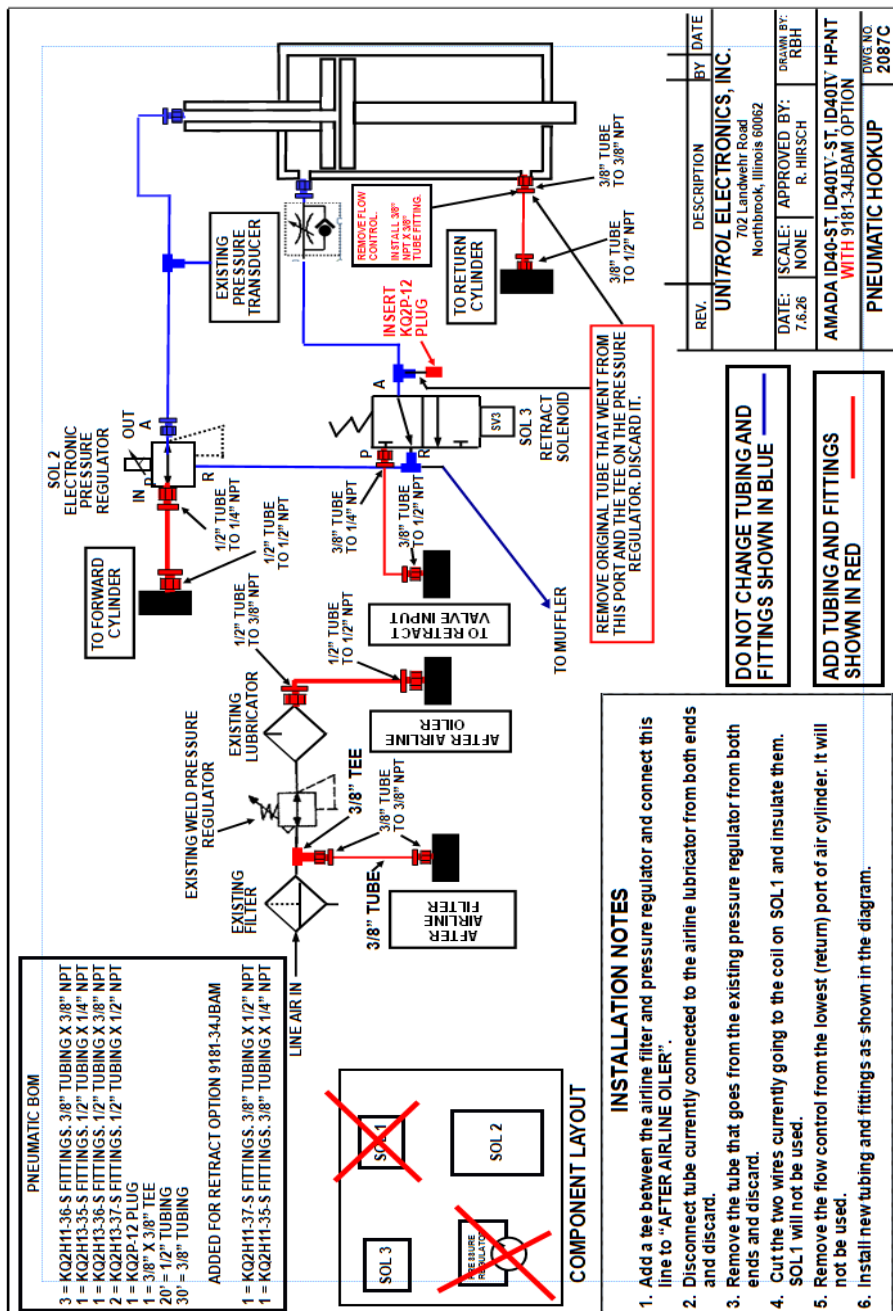


STAND ALONE SOFT TOUCH HOOKUP. 9181-344M. ID40TV ST. 2085A pub

PNEUMATIC CHANGES FOR AMADA ID40IVST, ID40IVHPNT AND ID40ST WELDING CONTROLS WITHOUT RETRACT OPTION 9181-34AMJB

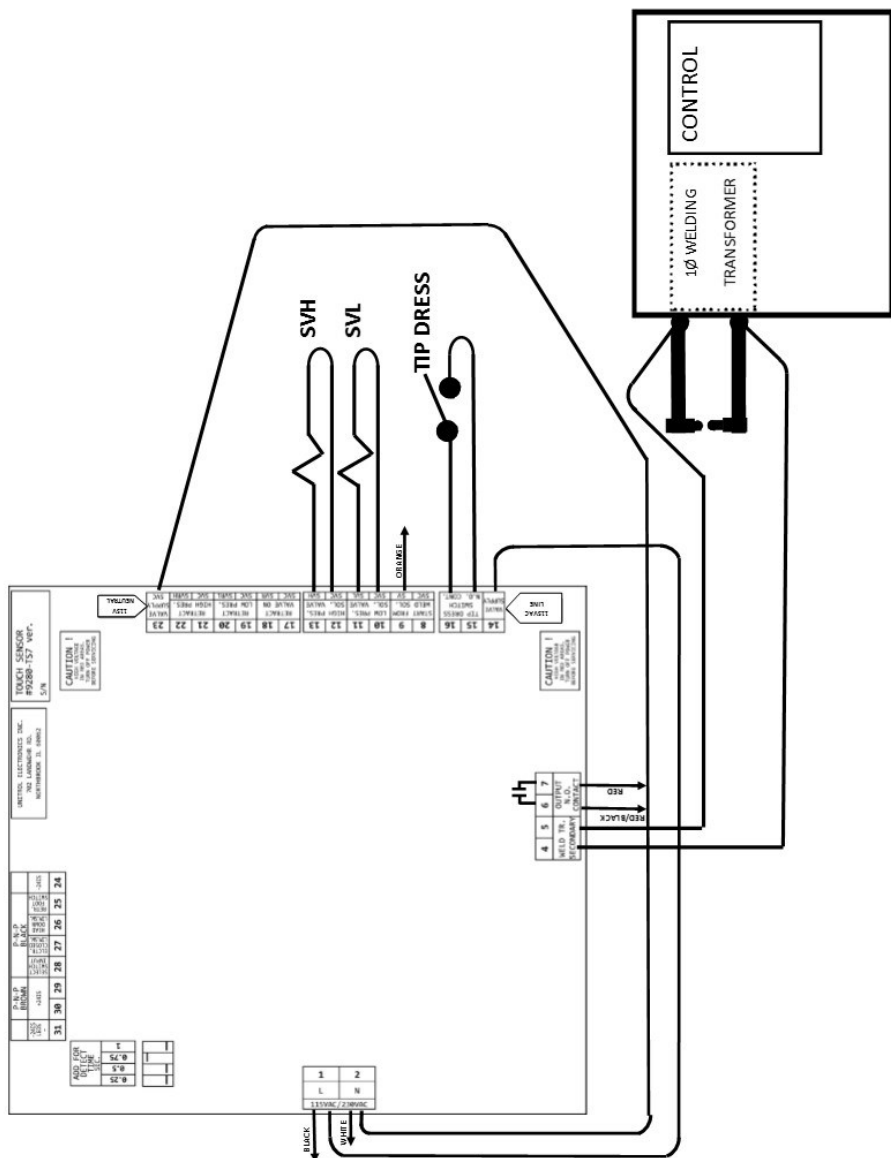


PNEUMATIC CHANGES FOR AMADA ID40IVST, ID40IVHPNT AND ID40ST WELDING CONTROLS WITH RETRACT OPTION 9181-34AMJB



INSTALLATION

HOOK-UP DRAWING

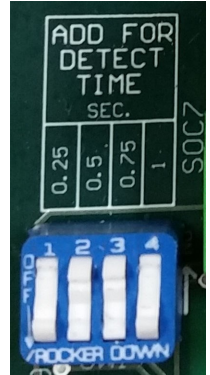


**SEE PAGES 8 AND 9 FOR SPECIAL INSTALLATION
DIRECTIONS FOR AMADA WELDING MACHINES**



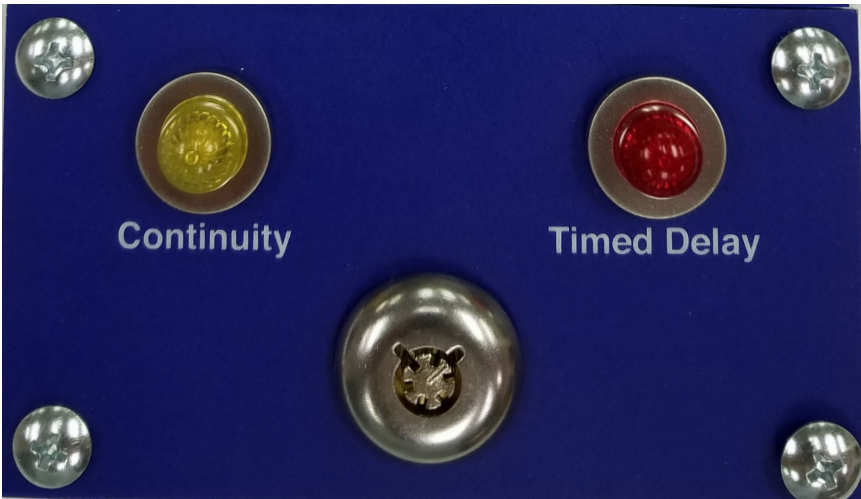
OPTIONAL TIMED DELAY 9181-34BPA

Some materials being welded have coatings or other conditions that prevent good continuity between electrodes. For these conditions option #9181-34BPA will allow the welder to be operated using **TIMING** rather than **CONTINUITY** to switch from low force to high welding force. In this case, the low force will be applied for the time set on the 4-position **DETECT TIME DIPswitch**, and then the high welding force will turn on. The time from initiation to high force is the **SUM** of the switches pushed down on top.



CAUTION: When the key switch is in the TIMED position, the HIGH WELDING FORCE will turn on after the selected delay(detect) time unless initiation is opened. This will happen even if a non-conductive material or body part is between the electrodes.

This option will be factory wired and supplied with the faceplate



OPTIONAL DEPTH SWITCH 9181-34LSA, 9181-34LSB

This option allows use of either CONTINUITY DETECTION or closure of a DEPTH SWITCH to turn on the weld pressure and start the weld sequence. It is useful when parts being welded have a non-conductive coating.



INSTALLATION:

9181-34LSA: Mount the PNP proximity switch that is supplied with this option on the body of the welder using the mounting bar. Modify and bend as needed.

9181-34LSB: Mount a customer-supplied mechanical limit switch or PNP proximity switch on the body of the welder.

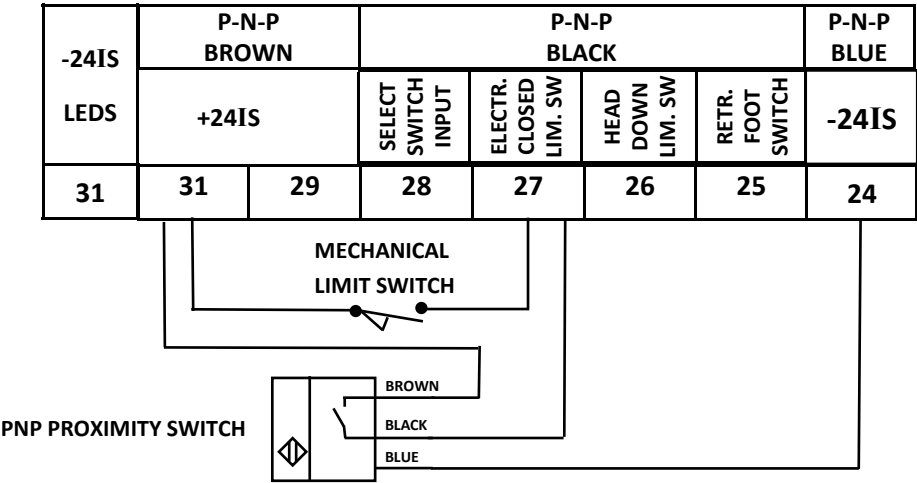
BOTH: Make and install an adjustable cam on the moving part of the welder that will go in front of this switch when the upper electrode are less than 1/4" from the lower electrode.

NOTE: If the parts being welded are very thick, setting the DEPTH SWITCH to close when there is a 1/4" gap between electrodes might not work when the part being welded is in place. In this case, set the DEPTH SWITCH to close when there is 1/4" gap from the **top of the part** being welded to the under-side of the upper electrode.

To protect from pinch point injury when a part is **not** between the electrodes, adjust the electrode holders so that the air cylinder will bottom out when the gap between electrodes is 1/4".

OPTIONAL DEPTH SWITCH 9181-34LSA, 9181-34LSB **continued**

Wire the switch to match the appropriate hookup below.



USE IN PRODUCTION:

Turn the key **counter-clockwise** to the **CONTINUITY** position. The yellow panel indicator will glow. In this position, high welding pressure will only be applied when electrical continuity is detected between the upper and lower electrodes.

Turn the key **clockwise** to the **DEPTH SWITCH** position. The red panel indicator will glow. After initiation, the electrodes will close with low force. If the **DEPTH SWITCH** closes before the maximum DETECT TIME (as set on the DIPswitch) has been reached, the **LIMIT SWITCH CLOSED** light will glow on the annunciator panel, electrodes will go to welding force, and the output of the sensor board will close to start the welding control.



CAUTION: When the key switch is in the **DEPTH SWITCH** position, the **HIGH WELDING FORCE** will turn on after the **DEPTH SWITCH** is closed. This will happen even if a non-conductive material or body part is between the electrodes.

ADJUSTING THE SOFT TOUCH VALVE SYSTEM

1. The ADVANCE PRESSURE puts air on the underside of the air cylinder piston to LIFT the welder ram. This is used to partially lower the force between the electrodes due to the dead (gravity) weight of the welder's ram. Increasing this ADVANCE PRESSURE value will decrease the force between the electrodes when closed under low force.
2. **Be sure that all flow control valves have been removed from the welder cylinder before doing any adjustment of this system.**
3. Set the **BALANCE** pressure regulator inside the enclosure so that the **BALANCE PRESSURE** gauge on the door is at approximately 1-psi.
4. Set the **OPEN** pressure regulator inside the enclosure so that the **OPEN PRESSURE** gauge on the door is at approximately 12 psi.
5. Turn the TIP DRESS switch ON. The electrodes should close. Check the force between the electrodes and **increase** the **BALANCE** pressure slightly if the force is great enough to crush a wood pencil more than 1/16" in depth. If the electrodes do not close, **decrease** the **BALANCE** pressure to as low as 0 psi. Even though the pressure gauge shows 0psi, this pressure is actually 1/2psi.
6. Adjust the **OPEN** pressure regulator so that when the **TIP DRESS** switch is **OFF**, the electrodes open smoothly. Use the **lowest** setting on the **OPEN** pressure regulator that will smoothly open the electrodes. This will produce the fastest electrode closing time.

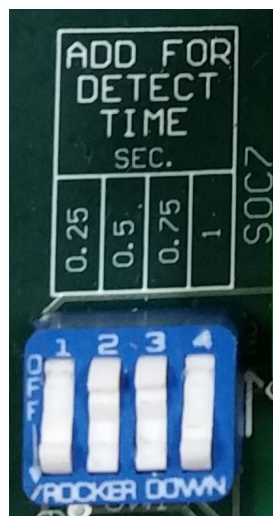
SETTING SOFT TOUCH BOARD MAXIMUM DETECT TIME SWITCHES

Locate the four-section **ADD FOR DETECT TIME** DIPswitch on the left side of each SOFT TOUCH board. This switch is marked: 1, .75, .5, and .25 seconds. Set the switches to a value that is about 2 times how long it will take for the electrodes to close. The on-board computer adds the value of these switches. For example, pushing 1 and .5 down to the left side will produce a detection time of 1.5 seconds. This setting is not critical. A typical setting is 1 second. Longer times might be needed for very long stroke cylinders

For example, in the photo below the 0.25 and 1 switch is pushed down toward the top of the board for a total maximum detect time of 1.25 seconds.

DETECT BLANK TIME

After the SOFT TOUCH board is initiated, the system will not look for continuity until the DETECT BLANK TIME has been reached. This time is 50% of the time you set on the **ADD FOR DETECT TIME** DIPswitch.



TESTING THE ELECTRONIC SYSTEM

1. Clean electrodes on welder
2. With nothing between electrodes, close electrodes by turning **ON** the **TIP DRESS** switch at the bottom of the annunciator panel.
3. The electrodes should close. The **Continuity Detected with no Start Signal** LED should start flashing.
4. Turn **OFF** the **TIP DRESS** switch and the electrodes will open.

STARTUP PROCEDURE

1. Turn on power to welding control.
2. The SOFT TOUCH annunciator panel should go through a test procedure and then the READY LED should turn on solidly.
3. If the READY LED does flashes slowly or quickly see the trouble shooting section in this direction book.
4. The system should be ready for operation. There is no customer calibration needed now or ever.



SUCCESSFUL SEQUENCE WITHOUT LIMIT SWITCH

1. Weld control sends voltage to terminal 9 (SV).
2. **START** lights
3. Low Force solenoid valve (SVL) is energized, **Low Force ON** LED lights.
4. Electrodes close
5. Continuity is detected and **Continuity Detected** LED lights.
6. High Force solenoid valve (SVH) is energized, **High Force ON** LED lights.
7. Output relay at terminals 6 & 7 closes to start weld control sequence, and **OK to Weld** LED lights.

UNSUCCESSFUL SEQUENCE

If continuity is not detected within the maximum time set on the DIPswitch, electrodes will **not** get to welding force, will open, and the **Detect Time Exceeded, Dress Electrodes** LED will light. Clean the electrodes and try the sequence again. Or check to see if the DIPswitch on the board is set to a long enough time to allow for the electrodes to close.

TESTING ELECTRODE CLOSING FORCE

Adjust the pneumatic system to produce safe closing electrode closing force using the directions on page 16 (to match the model number).

Use the TIP DRESS switch to close the electrodes each time you make a change in the pressure regulator settings. A successful pneumatic setting will provide a force under 50 pounds between the electrodes. There are two methods to check this force:

1. The most precise method is to use a tip force measuring instrument between the electrodes. This produces data that can be recorded on safety records and is less subjective to visual observation. Unfortunately most of these devices do not have any accuracy in the low force ranges. **Do not use an instrument that has poor or unknown accuracy in the low force range.** An excellent device that **can** read the low forces is Tuffaloy model 601-3000DLC. This unit can also be used to read welding forces up to 3,000 pounds.
2. Place a wood pencil between the electrodes and close using the TIP DRESS switch. The electrodes should not dent more than 1/32" into either side. A typical #2 wood office pencil works well. A carpenter's pencil works better since the flat area is much larger.

SETTING SYSTEM READING SENSITIVITY

The continuity sensing system monitors the conditioned voltage from wires connected to the welder secondary. This voltage (baseline) is read when the welding control sends the solenoid valve voltage to the sensor board to start a weld cycle. If when the electrodes close, continuity between electrodes through conducting metal is reached, this voltage will drop. The amount of this drop depends on many things including the resistance of the metal between the electrodes and the resistance of any coatings or dirt on the electrodes or metal.

If this voltage drop exceeds a minimum value, the sensor board closes the output relay to start the welding sequence. If your sensor board has the blue 4-position switch, this minimum voltage drop value can be set to make the system more or less sensitive.

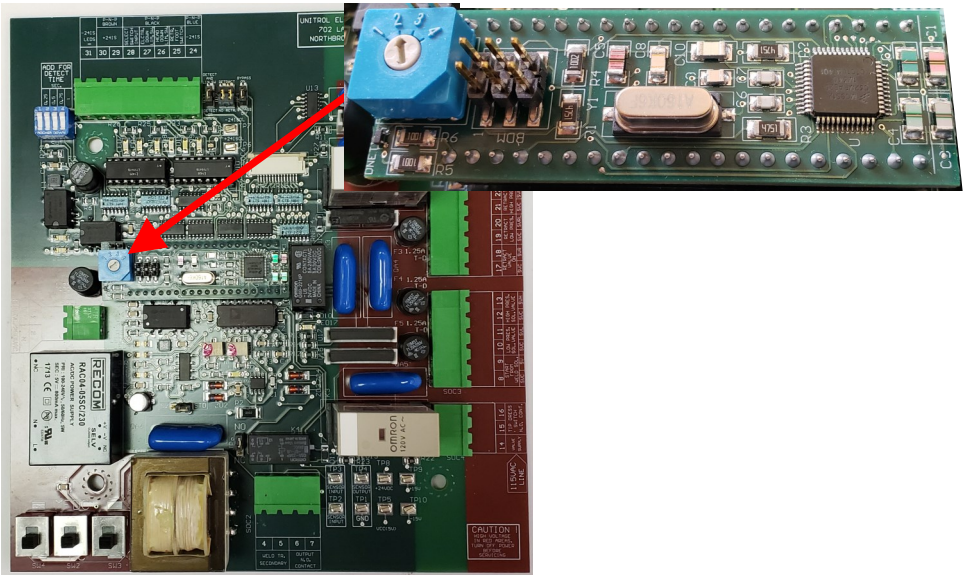
The setting positions are:

1 = 1/4volt 2 = 1/2volt 3 = 3/4volt 4 = 1volt

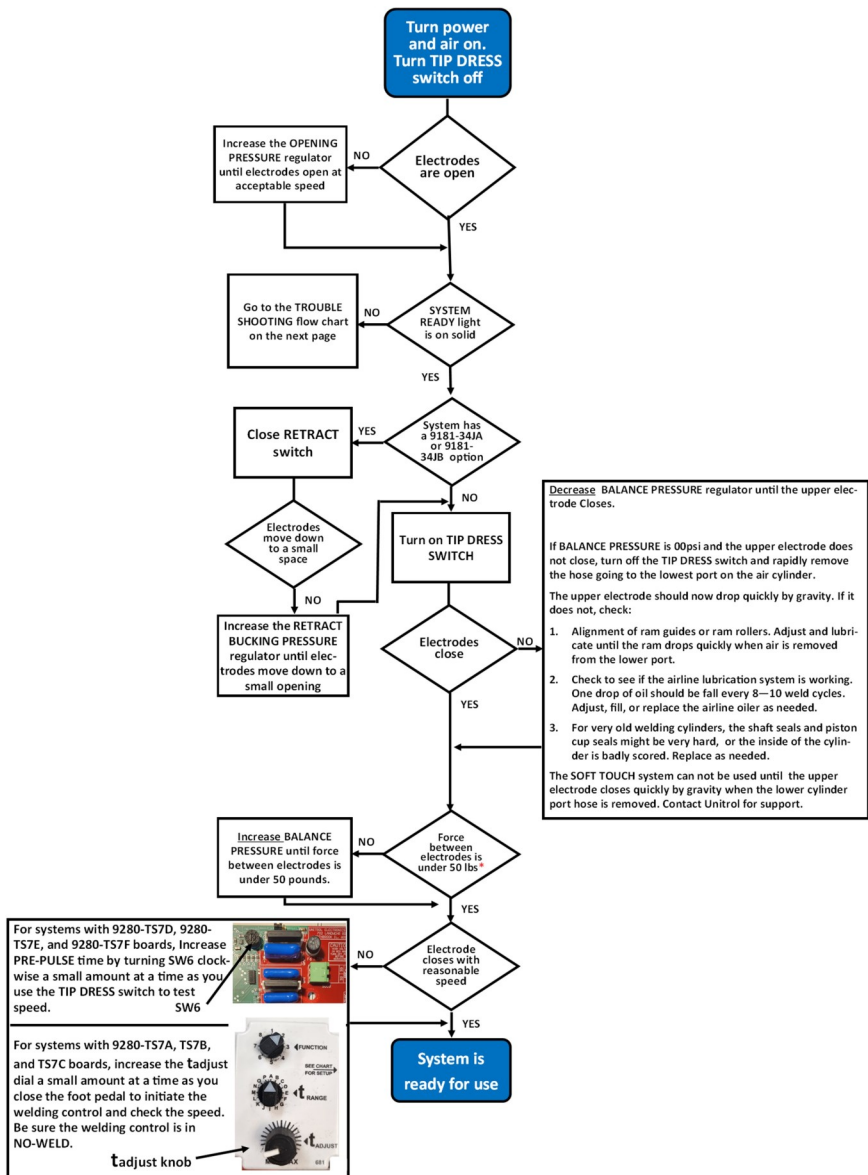
This switch is normally set on position 2 for 1/2 volt drop.

MAKE MORE SENSITIVE: If you are working with cross wire or high resistance metals and keep getting Detect Time Exceeded, try lowering this switch to 1.

MAKE LESS SENSITIVE: If you are experiencing random higher-speed closing, raise the switch position 3 or position 4.

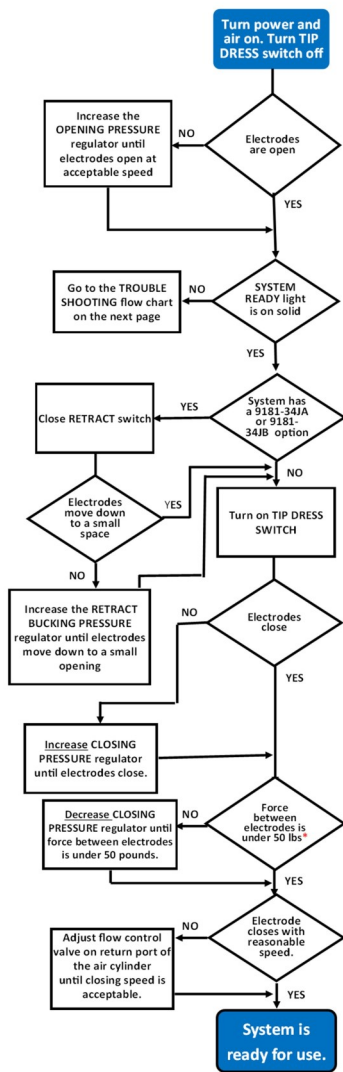


INITIAL STARTUP FLOW CHART



* If you don't have a tip force measuring instrument, place a wooden office pencil between the electrodes and turn on the TIP DRESS switch. Set the force so that the electrode indents 1/16" or less.

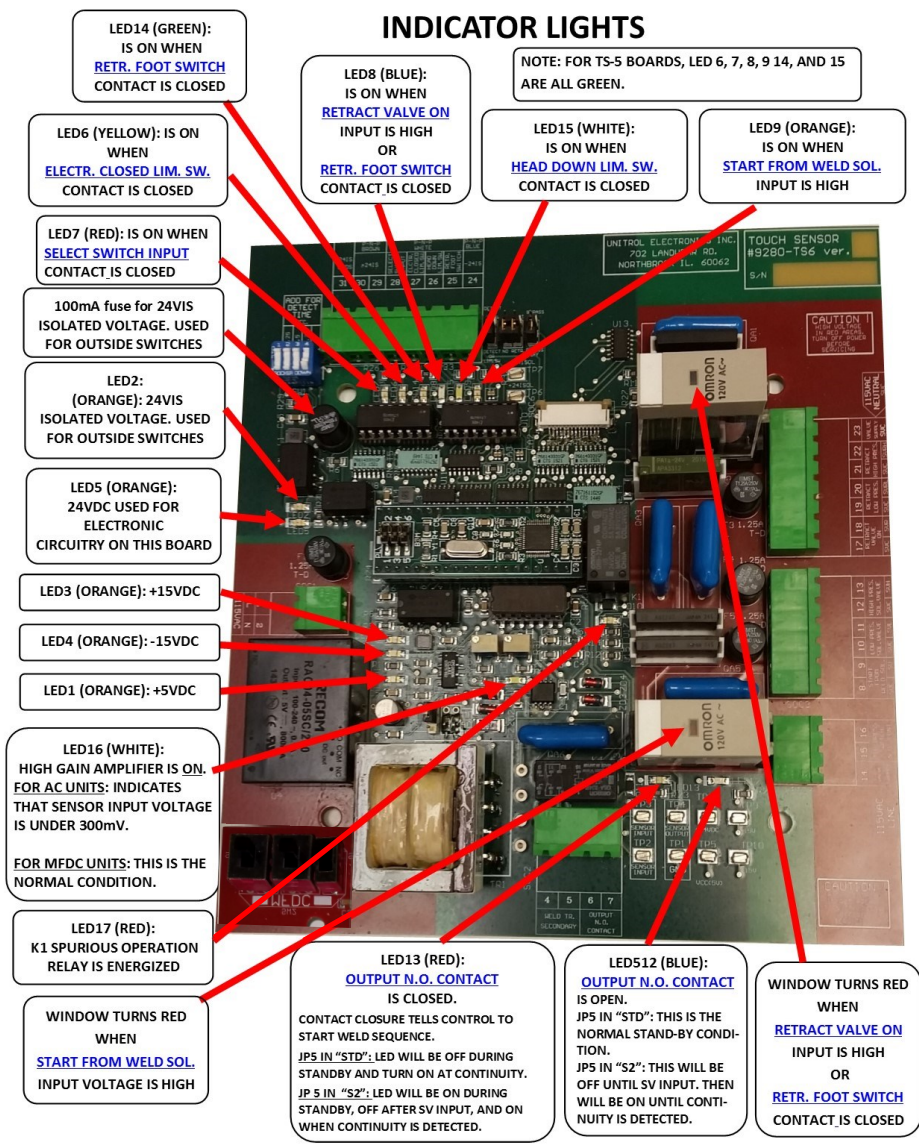
TROUBLE SHOOTING FLOW CHART



* If you don't have a tip force measuring instrument, place a wooden office pencil between the electrodes and turn on the TIP DRESS switch. Set the force so that the electrode indents 1/16" or less.

SOFT TOUCH SENSOR BOARD TS6 AND TS7

INDICATOR LIGHTS



Having trouble or need answers to your questions?

Call: Unitrol tech support

847-480-0115, M-F 9:00 - 5:00 CT.

Or Email at:

techsupport@unitrol-electronics.com

Unitrol supplies free phone support for the life of this and all their products.

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