

# SOFT TOUCH for NON-UNITROL CONTROLS

9181-34YB/115, 9181-34WB/115  
9181-34YB/24DC, 9181-34WB/24DC  
9181-34YM/115, 9181-34YM/115  
9181-34WM/24DC, 9181-34WM/24DC  
9181-34YB/24AC, 9181-34WB/24AC  
9181-34YM/24AC, 9181-34WM/24AC



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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.

Having trouble or need answers to your questions? Unitrol supplies free phone support for the life of this and all our products.

You can contact us:

**By Phone:**

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

**By Email:**

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**By Regular Mail:**

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Technical Support

702 Landwehr Road

Northbrook, Illinois 60062



# MODEL NUMBER AND OPTIONS AS CHECKED BELOW

## SERIAL NUMBER:

✓	MODEL	WELDER TYPE & HARDWARE	RAM TYPE	VALVE VOLTAGE
	9181-34WB/115	1Ø AC INCLUDES A SNUBBER AND 2=MUFFLERS	HEAVY WEIGHT	115AC
	9181-34WB1/115		HEAVY WEIGHT, 1" VALVES	
	9181-34YB/115		LIGHT WEIGHT, ROCKER ARM	
	9181-34WB/24DC		HEAVY WEIGHT	24VDC
	9181-34YB/24DC		LIGHT WEIGHT, ROCKER ARM	
	9181-34WB/24AC		HEAVY WEIGHT	24VAC
	9181-34YB/24AC		LIGHT WEIGHT, ROCKER ARM	
	9181-34WM/115		MFDC (INVERTER) INCLUDES 2=MUFFLERS	HEAVY WEIGHT
	9181-34YM/115	LIGHT WEIGHT, ROCKER ARM		
	9181-34WM/24DC	HEAVY WEIGHT		24VDC
	9181-34YM/24DC	LIGHT WEIGHT, ROCKER ARM		
	9181-34WM/24AC	HEAVY WEIGHT		24VAC
	9181-34YM/24AC	LIGHT WEIGHT, ROCKER ARM		
<b>OPTIONS</b>				
	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. <b>Includes</b> HEAD DOWN proximity switch and mounting bracket kit. May require additional field bracketry to match welder		
	9181-34JB	Retract option <b>without</b> proximity switch. For use with welders that have <b>separate</b> 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 .		
	9181-34FRL-1/2	½" NPT Filter, regulator, lubricator with inter block for pilot line. With air gauge. Not needed if existing regulator is good.		
	9181-34FRL-3/4	¾" NPT Filter, regulator, lubricator with inter block for pilot line. With air gauge. Not needed if existing regulator is good.		
	9181-34TECNA	Line voltage transformer and fuses for installation on Tecna welding controls.		
	9181-34/115	Adds 50VA transformer for welders without 115VAC available.		
	9181-34F2	System for operation on welders with FORGE DELAY.		

# 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.**

# TABLE OF CONTENTS

1	VERIFY YOUR SOFT TOUCH SENSOR BOARD IS CORRECT
2	HOW SYSTEM OPERATES
3	INSTALLATION, 9181-34W HEAVY WEIGHT SERIES
4	INSTALLATION, 9181-34Y LIGHT WEIGHT SERIES
5	WIRING CONTROL: CONNECTING SIGNAL PICKUP WIRES
6	CONNECTING THE SNUBBER
6	CONNECTING CONTROL CABLE
7	CONTROL CABLE WIRING CHART
8	SPECIAL WIRING FOR OPTIONS 9181-TECNA AND 9181-34/115
9	ELECTRICAL HOOKUP, 9181-34WB/115, 9181/34YB/115
10	ELECTRICAL HOOKUP, 9181-34WB/24DC,9181/34YB/24DC
11	ELECTRICAL HOOKUP, 9181-34WB/24AC,9181/34YB/24AC
12	ELECTRICAL HOOKUP, 9181-34WM/115, 9181/34YM/115
13	ELECTRICAL HOOKUP,9181-34WM/24DC,9181/34YM/24DC
14	ELECTRICAL HOOKUP,9181-34WM/24AC,9181/34YM/24AC
15	RETRACT OPTION 9181-34JA
17	RETRACT OPTION 9181-34JB
19	TIMED DELAY OPTION 9181-34BP
20	DEPTH SWITCH OPTION, 9181-34LSA, 9181-34LSB
22	PNEUMATIC HOOKUP, 9181-34Y LIGHT WEIGHT
23	PNEUMATIC HOOKUP, 9181-34W HEAVY WEIGHT
24	ADJUSTING SOFT TOUCH VALVES
25	SETTING MAXIMUM DETECT TIME SWITCHES, BLANK TIME
25	SETTING AND TESTING ELECTRODE CLOSING FORCE
26	TESTING ELECTRODE CLOSING FORCE
27	START-UP PROCEDURE
28	TROUBLE SHOOTING CHART
29	SETTING SYSTEM READING SENSITIVITY
30	BUCKING PRESSURE OPTION 9181-34F2
31	LED INDICATOR LIGHTS

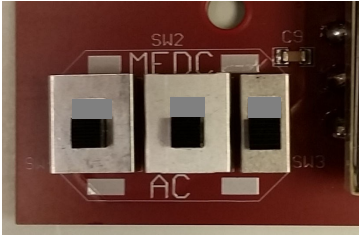




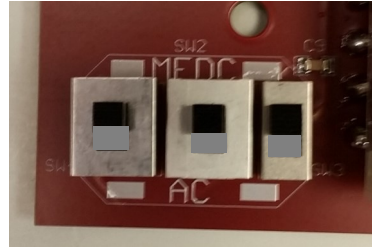
# VERIFY YOUR SOFT TOUCH SENSOR BOARD IS CORRECT

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.

**1. TYPE OF WELDING CONTROL.** This board can be set to operate either a 1ØAC welder or an MFDC (inverter) welder. This is done by pushing the three switches on the lower left corner to a position to match your welding control.

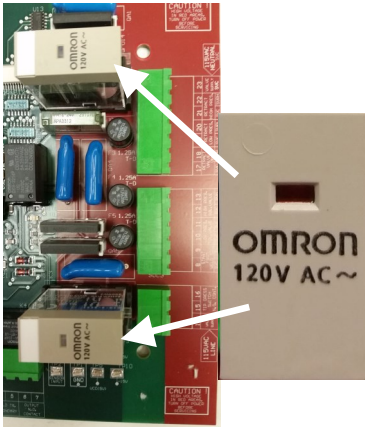


**FOR 1ØAC WELDERS**

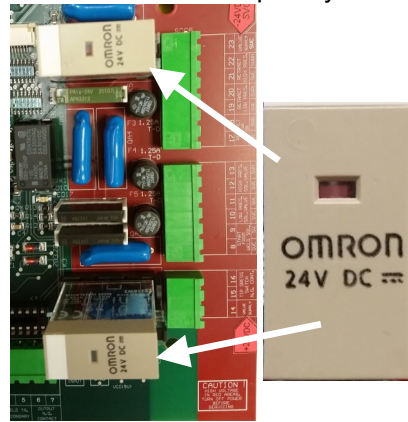


**FOR MFDC (inverter) WELDERS**

**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  
SOLENOID VALVES**



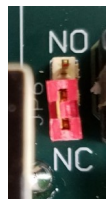
**FOR 24VDC  
SOLENOID VALVES**



**NORMAL  
POSITION**

**3. SPECIAL INITIATION SCHEMES.** Some Tecna welders do not have a pressure switch input and use a normally CLOSED switch that **OPENS** when the second stage of the footswitch is pushed. For these welders, move Jumper JP6 (next to the transformer) to the NC position and connect output terminals in **parallel** to the second stage Normally-Closed footswitch contact.

For Tecna welders, connect output #6 on sensor board Techna **START NO** terminal, and wire from #7 on sensor board to Techna **AUX** terminal to put this in parallel to the footswitch second stage.



**TECNA  
POSITION**

# 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 part 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 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 valve.



Connect to air cylinder port that closes the electrodes.

Connect to point between air filter/water trap and input to welding pressure regulator

Connect to point after airline oiler (weld pressure)

Connect to air cylinder port that opens the electrodes.

Connect to air cylinder port that opens the electrodes.

Connect to point between air filter/water trap and input to welding pressure regulator

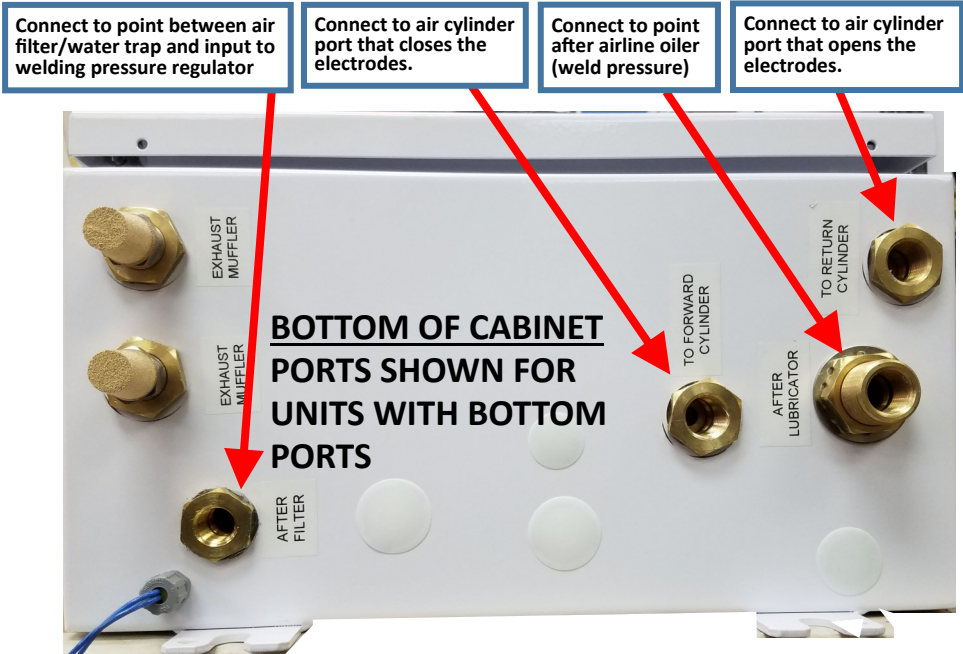
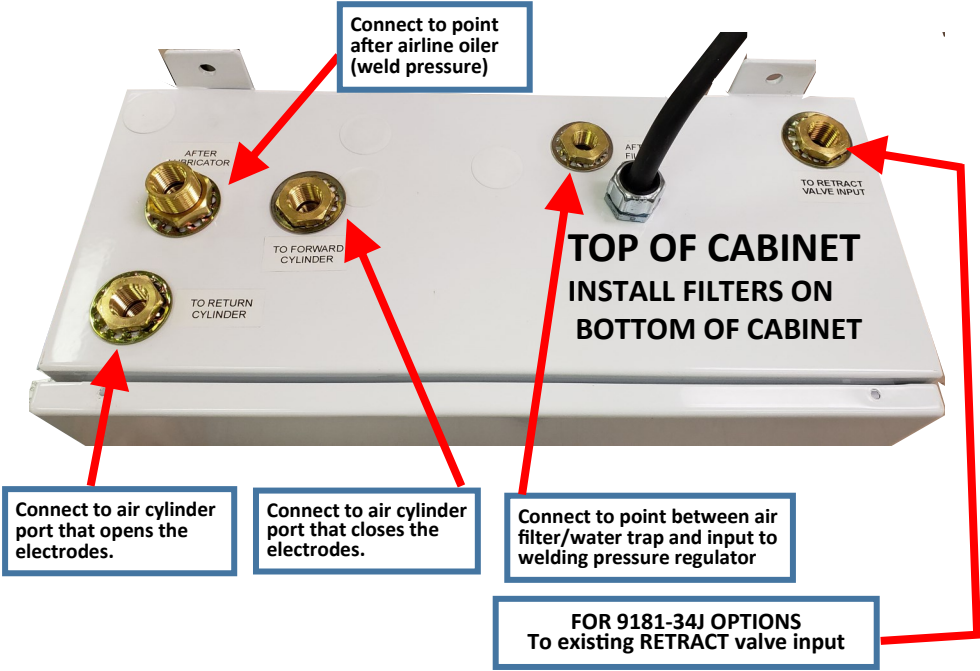
Connect to point after airline oiler (weld pressure)

Connect to air cylinder port that closes the electrodes.



# HOSE CONNECTION FOR 9181-34Y SERIES CONTROLS

Note that this system REPLACES the existing weld solenoid valve.

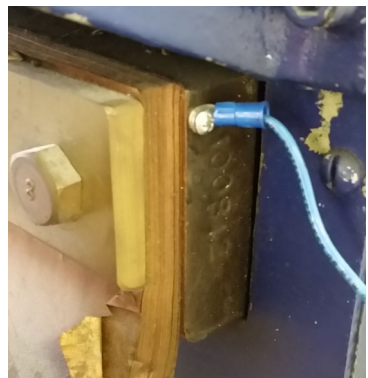


# WIRING CONTROL

## 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.

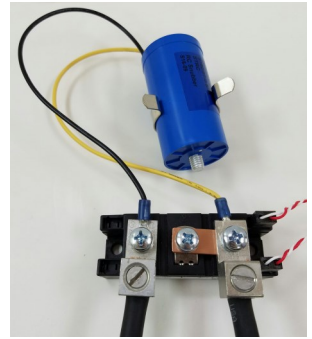
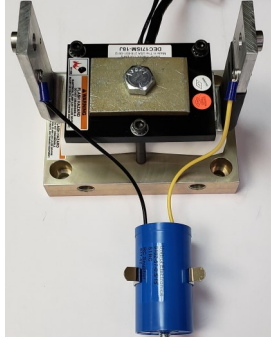
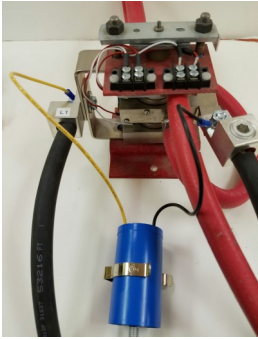
**CRITICAL: BE SURE THAT THE SURFACE UNDER EACH TERMINAL IS CLEAN, AND THAT THE SCREWS ARE FULLY TIGHTENED. Operational problems will occur if this connection is not good.**



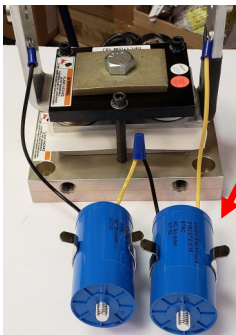
# WIRING CONTROL (CONTINUED)

## CONNECTING SNUBBER

- For 9181-34WB... and 9181-34YB... models only, Connect one blue snubber cylinder in this kit across the SCR contactor per the HOOK-UP drawing and typical photos below. It does not matter which wire from the snubber connects to which side of the SCR contactor.



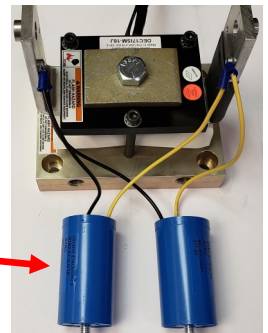
**SPECIAL CASES:** A second blue snubber has been supplied with this SOFT TOUCH system.



**SERIES**

For EN1000 and EN1001 controls, put the two snubbers in **SERIES**.

For welders with less than 40mVAC read between electrodes, put the two snubbers in **PARALLEL**.



**PARALLEL**

## CONNECTING CONTROL CABLE

- Route the black multi-wire cable from the top of the SOFT TOUCH enclosure to the welding control.
- Install the supplied strain relief fitting in a 7/8" diameter hole in the welding control and bring cable into the control.
- Trim the cable to allow it to reach the terminals shown in the table on the next page. Wire as shown on the next page.

NOTE: Check the Unitrol web site [www.unitrol-electronics.com](http://www.unitrol-electronics.com) SUPPORT tab for hookup charts for some popular welding controls.

# WIRING CONTROL

(CONTINUED)

## CONTROL CABLE WIRING CHART

WIRE COLOR	TS7 TERM	CONNECT IN WELDING CONTROL FOR 24VDC MODELS 9181-34WB/24DC, 9181-34WM/24DC 9181-34YB/24DC 9181-34YM/24DC		CONNECT IN WELDING CONTROL FOR 115VAC MODELS 9181-34WB/115 9181-34WM/115 9181-34YB/115 9181-34YM/115
		FOR CONTROLS SWITCHED WITH +24VDC <sup>2</sup>	FOR CONTROLS SWITCHED WITH 0VDC <sup>3</sup>	
BLACK	1	115VAC L		115VAC L
WHITE	2	115VAC N		115VAC N
RED/BLACK ST.	6	INIT. PERMISSION <sup>1</sup>		INIT. PERMISSION <sup>1</sup>
RED	7	INIT. PERMISSION <sup>1</sup>		INIT. PERMISSION <sup>1</sup>
		FOR CONTROLS SWITCHED WITH +24VDC <sup>2</sup>	FOR CONTROLS SWITCHED WITH 0VDC <sup>3</sup>	
BLUE	14	24VDC +	24VDC 0V	115VAC = NOT USED 24VAC = 24VAC L
WHITE/BLACK ST.	23	24VDC 0V	24VDC +	115VAC = NOT USED 24VAC = 24V N
ORANGE	9*	WELD CONTROL SOLENOID VALVE OUTPUT <sup>4</sup>		115VAC L SOLENOID VALVE DRIVER OUTPUT <sup>2</sup>
GREEN	-	GROUND STUD		GROUND STUD
<b>USED ONLY WITH RETRACT OPTIONS 9181-34JA OR 9181-34JB</b>				
GREEN/BLACK ST.	18	RETRACT IN SIGNAL <sup>4</sup>		RETRACT IN SIGNAL <sup>4</sup>

- INIT. PERMISSION** is either a PRESSURE SWITCH input terminal or in series with FOOTSWITCH second stage. These wires connect to a dry contact relay.
- Welding controls that use +24VDC to operate the welding (and RETRACT if applicable) solenoid valve.
- Welding controls that use 0VDC to operate the welding (and RETRACT if applicable) solenoid valve.
- The potential of this output should be the same as the voltage on terminal #14 (BLUE wire).

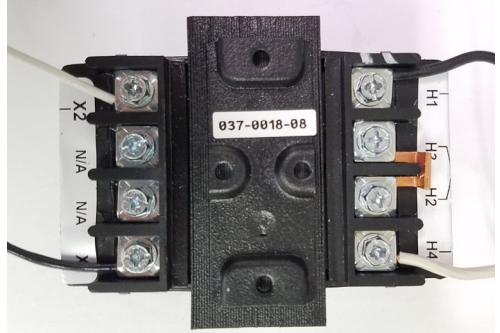
**CAUTION: INCORRECT CONNECTION WILL CAUSE SEVERE DAMAGE.**

# FOR OPTIONS 9181-TECNA AND 9181-34/115

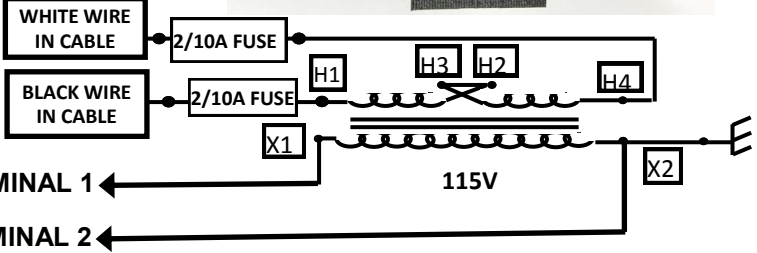
Connect jumper on primary to match line voltage.  
Connect the white and black wires from the cable to that line voltage in the welding control.

## FOR 440V POWER

JUMP H2 + H3



TO 440V  
SUPPLY IN  
WELDING  
CONTROL

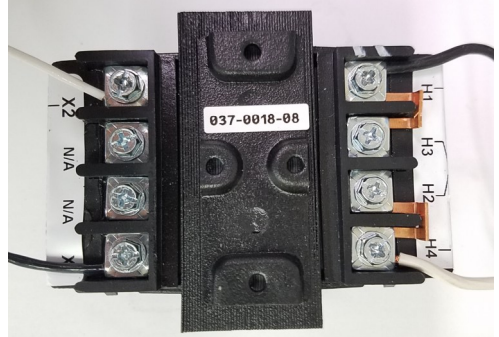


TS7 BOARD TERMINAL 1

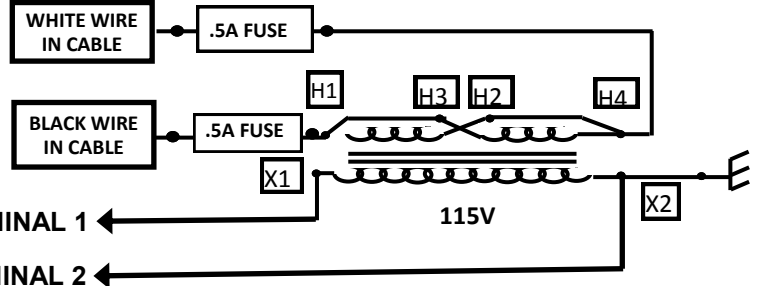
TS7 BOARD TERMINAL 2

## FOR 220V POWER

JUMP H1 + H3  
JUMP H2 + H4



TO 220V  
SUPPLY IN  
WELDING  
CONTROL

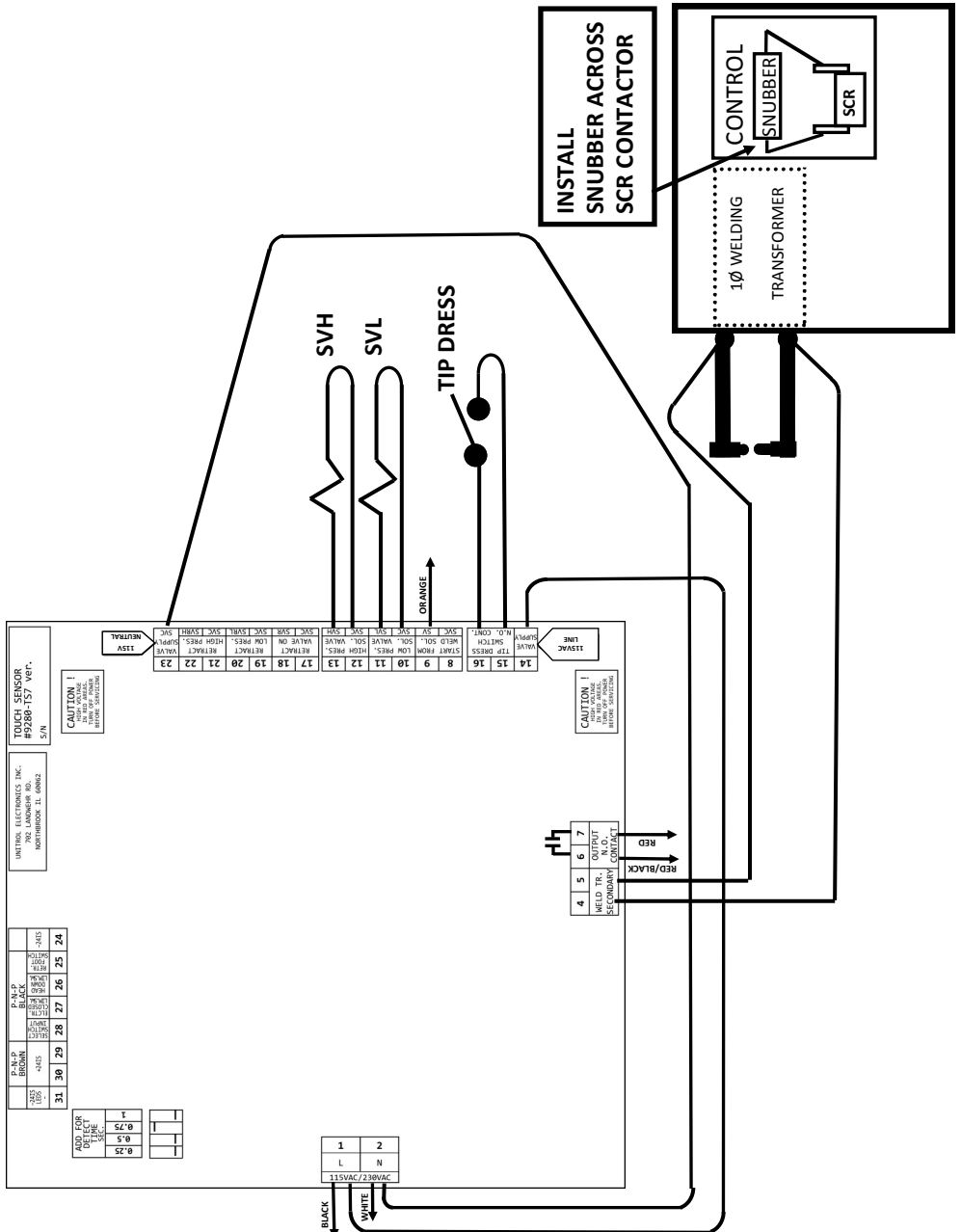


TS7 BOARD TERMINAL 1

TS7 BOARD TERMINAL 2



# INSTALLATION HOOK-UP DRAWING 9181-34WB/115, 9181-34YB/115













# OPTIONAL RETRACT WITH SOFT TOUCH

## 9181-34JA

### FOR WELDERS WITH A RETRACT TYPE CYLINDER.

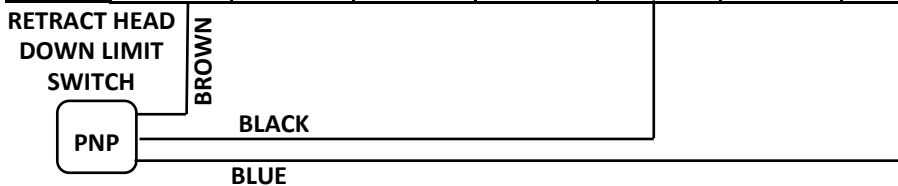
### OPERATED BY A 3-SECTION FOOT SWITCH

This type of foot switch has the RETRACT switch controlled as the first level and mechanically latched. The other two levels of this foot switch operate the welding sequence.

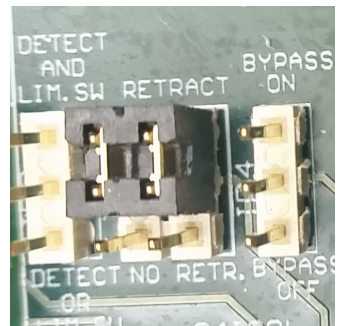
This option protects against pinch point injury when bringing the electrodes from fully open RETRACT position to the WORK position (small space between electrodes). The option includes a PNP proximity switch that is adjusted to go high when the retract cylinder is fully bottomed putting the electrodes in the (small opening) WORK position.

1. Install the PNP proximity switch using the starter bracket kit in this option. Modify as necessary to work with your welder. The proximity switch has to be **blocked** when the ram is down in the WORK (small opening) position. This will put 24VDC into terminal 26.
2. Wire the PNP proximity switch as shown below.

-24IS LEDS	P-N-P BROWN		P-N-P BLACK			P-N-P BLUE	
	+24IS		SELECT SWITCH INPUT	ELECTR. CLOSED LIM. SW	HEAD DOWN LIM. SW	RETR. FOOT SWITCH	-24IS
<b>31</b>	<b>30</b>	<b>29</b>	<b>28</b>	<b>27</b>	<b>26</b>	<b>25</b>	<b>24</b>



3. Move the double **RETRACT** jumper plug to the **RETRACT** (upper) position as shown. This is located on the upper left corner of the board.



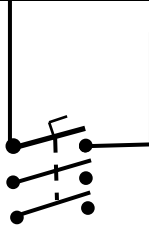
# OPTIONAL RETRACT WITH SOFT TOUCH

## 9181-34JA

(continued)

3. Connect the 3-stage foot switch as shown below.

-24IS LEDS	P-N-P BROWN		P-N-P BLACK				P-N-P BLUE
	+24IS		SELECT SWITCH INPUT	ELECTR. CLOSED LIM. SW	HEAD DOWN LIM. SW	RETR. FOOT SWITCH	-24IS
31	30	29	28	27	26	25	24



**3- STAGE FOOT SWITCH:**  
**TOP: LATCHING RETRACT SWITCH**  
**MIDDLE: STAGE 1 WELDING**  
**BOTTOM: STAGE 2 WELDING**

See bottom of page 17 for PNEUMATIC HOOKUP for this option.



# OPTIONAL RETRACT WITH SOFT TOUCH

## 9181-34JB

This option 9181-34JB is for RETRACT that operates from either **RETRACT VOLTAGE** from the welding control or from a **separate RETRACT** foot switch.

**DO NOT USE THIS OPTION FOR WELDERS THAT USE A COMMON WELD AND RETRACT FOOT SWITCH (use 9181-34JA)**

### HOOKUP FOR SYSTEMS USING RETRACT VOLTAGE SIGNAL FROM THE WELDING CONTROL:

Remove the existing wire from the welding control RETRACT valve driver terminal and wire as shown below to terminal #18

#### WHITE/BLACK STRIPE WIRE:

For controls that operate 115VAC solenoid valves: Connect to 115V N.  
 For controls that operate 24DC solenoid valves:  
 That use +24VDC for switching this will be 0V (GND).  
 That use 0V (GND) for switching this will be +24VDC.

17	18	19	20	21	22	23
RETRACT VALVE ON	RETRACT VALVE OFF	LOW PRES. PRES.	RETRACT HIGH PRES.	VALVE DRIVER	VALVE DRIVER	VALVE DRIVER
SVCL	SVRL	SVCL	SVCL	SVCL	SVCL	SVCL

SVRH

FACTORY WIRED TO RETRACT HIGH PRES. VALVE



LEAVE EXISTING RETRACT SOLENOID VALVE CONNECTED TO WELDING CONTROL.

#### GREEN/BLACK STRIPE WIRE:

FOR controls that operate 115VAC solenoid valves: Wire that went to original RETRACT solenoid valve, 115V L (not neutral)  
 FOR controls that operate 24DC solenoid valves: Wire that went to original RETRACT solenoid control voltage.  
 Controls that use 0V for switching this will be 0V (GND).  
 Controls that use +24VDC for switching this will be +24VDC.

### HOOKUP FOR SYSTEMS USING A SEPARATE RETRACT SWITCH

-24IS LEDS	P-N-P BROWN		P-N-P BLACK			P-N-P BLUE	
	+24IS		SELECT SWITCH INPUT	ELECTR. CLOSED LIM. SW	HEAD DOWN LIM. SW	RETR. FOOT SWITCH	-24IS
31	30	29	28	27	26	25	24

LATCHING RETRACT  
FOOT SWITCH



# OPTIONAL RETRACT WITH SOFT TOUCH

## 9181-34JB (continued)

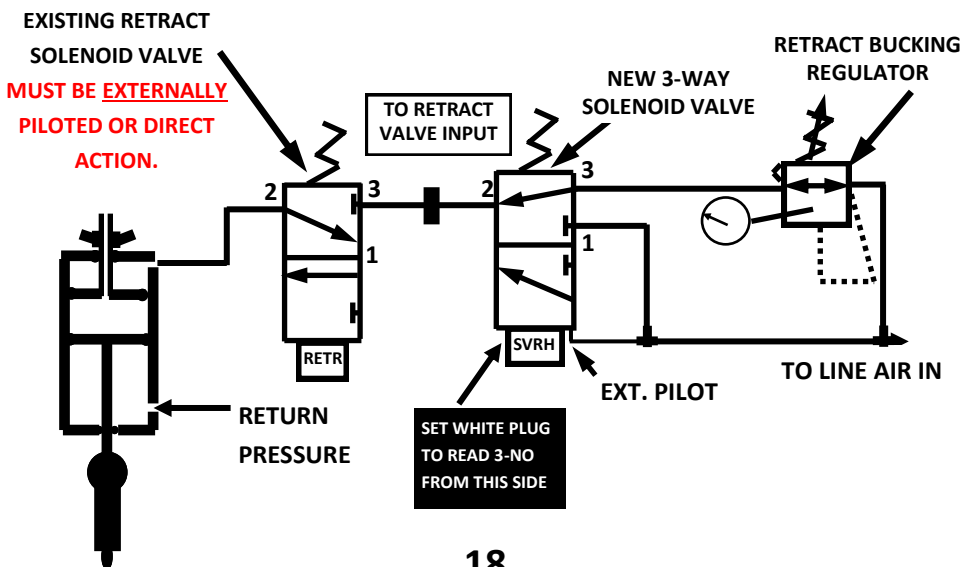
Insert a jumper from terminal 26 to terminal 29. Note that the HEAD DOWN LIM. SW light on the annunciator panel will be on permanently when this jumper is in place.

-24IS LEDS	P-N-P BROWN		P-N-P BLACK				P-N-P BLUE
	+24IS		SELECT SWITCH INPUT	ELECTR. CLOSED LIM. SW	HEAD DOWN LIM. SW	RETR. FOOT SWITCH	-24IS
<b>31</b>	<b>30</b>	<b>29</b>	<b>28</b>	<b>27</b>	<b>26</b>	<b>25</b>	<b>24</b>



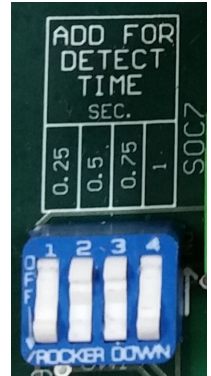
**PLUMBING:** Connect hoses from the input port on the existing RETRACT SOLENOID to the bulkhead on the SOFT TOUCH enclosure as shown below.

**ADJUST** the RETRACT BUCKING REGULATOR until the electrodes close with less than 50 pounds of force. If you change the RETURN pressure you will have to adjust the bucking regulator.



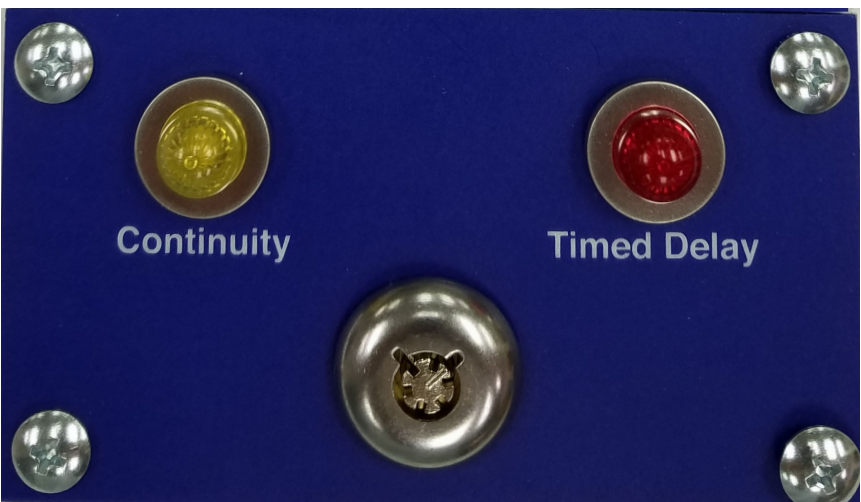
## OPTIONAL TIMED DELAY 9181-34BPA

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.

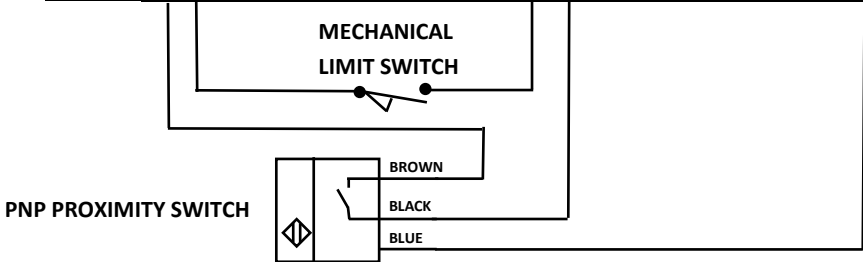
**NOTE:** If the parts being welded are very thick, setting the DEPTH SWITCH to close when there is a 1/4" gap between electrodes might not work when the part being welded is in place. In this case, set the DEPTH SWITCH to close when there is 1/4" gap from the **top of the part** being welded to the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

-24IS	P-N-P BROWN		P-N-P BLACK				P-N-P BLUE
	+24IS		SELECT SWITCH INPUT	ELECTR. CLOSED LIM. SW	HEAD DOWN LIM. SW	RETR. FOOT SWITCH	-24IS
31	30	29	28	27	26	25	24



### 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.

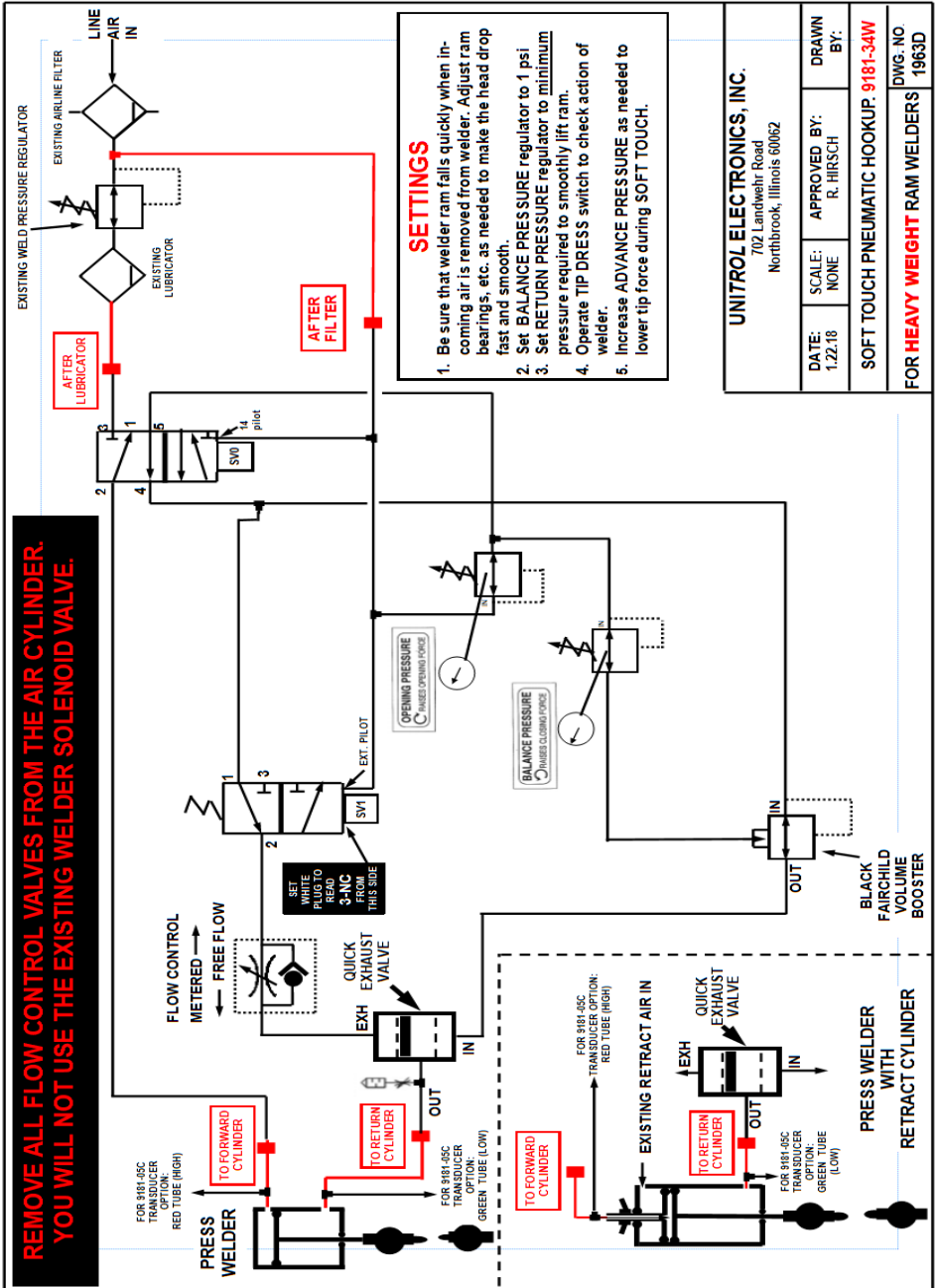


**CAUTION: When the key switch is in the DEPTH SWITCH position, the HIGH WELDING FORCE will turn on after the DEPTH SWITCH is closed. This will happen even if a non-conductive material or body part is between the electrodes.**



# PNEUMATIC HOOKUP

9181-34W... HEAVY WEIGHT RAM WELDERS  
CONNECT HOSES TO PORTS SHOWN **RED** BELOW



# ADJUSTING THE SOFT TOUCH VALVE SYSTEM

## FOR 9181-34WB... SERIES CONTROLS - HEAVY WEIGHT RAMS

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.

## FOR 9181-34YB... SERIES CONTROLS - LIGHT WEIGHT RAMS AND ROCKER ARM WELDERS

1. Set the **CLOSE** pressure regulator inside the enclosure so that the **CLOSE PRESSURE** gauge on the door is at approximately 3psi.
2. Set the **OPEN** pressure regulator inside the enclosure so that the **OPEN PRESSURE** gauge on the door is at approximately 12 psi.
3. Turn the **TIP DRESS** switch **ON**. The electrodes should close. If they don't, **increase** the **CLOSE** pressure regulator. Check the force between the electrodes and **decrease** this pressure slightly if the force is great enough to crush a wood pencil more than 1/16" in depth.
4. Adjust the **OPEN** pressure regulator so that when the **TIP DRESS** switch is **OFF**, the electrodes open smoothly. Use the **lowest** setting on this **OPEN** pressure regulator that will smoothly open the electrodes. This will produce the fastest electrode closing time.



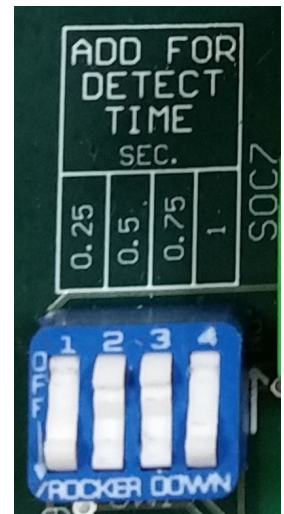
## SETTING SOFT TOUCH BOARD MAXIMUM DETECT TIME SWITCHES

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 BASIC PNEUMATIC 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.
4. Turn **OFF** the **TIP DRESS** switch and the electrodes will open.

# SETTING AND TESTING

## ELECTRODE CLOSING FORCE

Turn power on to SOFT TOUCH system.

Adjust the pneumatic system to produce safe closing electrode closing force using the directions on page 22 or 23 to match the model number of this SOFT TOUCH system.

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 1/16" into either side. A typical #2 wood office pencil works well. A carpenter's pencil works better since the flat area is much larger.

# 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.

# TROUBLE SHOOTING CHART

**NOTE: This SOFT TOUCH system will not operate if any fault is detected. SYSTEM READY LED will glow solidly if all faults are cleared.**

INDICATION	CAUSE	WHAT TO CHECK OR DO
<span style="color: green;">READY</span> LED not on	No power to control.	Be sure that 115V is at terminals #1 and #2.  Voltage from welding control valve driver output connected to terminals 8 and 9 on the sensor board is on when power is turned on to the SOFT TOUCH system. Correct weld control.
<span style="color: green;">READY</span> LED is on but is <b>flashing</b> . Electrodes will not close when welding control is initiated.	One fault shown below is detected. The <span style="color: green;">READY</span> LED will not glow <b>solidly</b> until system has cleared all faults.	SEE ITEMS TO CHECK ON BOXES BELOW
<span style="color: green;">READY</span> LED flashing <b>slowly</b> . Electrodes will not close when welding control is initiated.  <b>Or</b>  <span style="color: green;">Continuity Detected with No Start Signal</span> LED on when electrodes are not touching.	Voltage on blue sensor wires is too low. Lowering of this voltage is used by the sensor board to detect when continuity is reached.  Insulator missing or some conducting component is connected between insulated side of welder secondary and welder frame.	Be sure that the two blue pickup wires coming from the cabinet are correctly connected to welder secondary. <b>See page 5</b> Be sure that the <b>TIP DRESS</b> switch is <b>down</b> (OFF)  <b>For MFDC inverter welders:</b> Be sure that all three switches on lower left of board are set to the MFDC position. <b>See page 1</b>  <b>For 1Ø AC welders:</b> <b>1.</b> Be sure that all three switches on lower left of the sensor board are set to the AC position. <b>See page 1.</b> <b>2.</b> Be sure that a snubber is installed correctly. <b>See page 6.</b> <b>3.</b> Measure AC voltage at TP2 - TP3. It should be a minimum of 25mv (.025V). If it is above zero but below 25mv, a second snubber might have to be added across the SCR to bring this voltage up. <b>4.</b> If it is 0mv, replace the snubber. <b>See page 1.</b>  <b>Check mechanical system.</b> Disconnect flexible shunt that connects weld transformer secondary to moving arm, pull out plug on SOFT TOUCH board at SOC2 (terminals 4 to 7). Measure resistance between electrodes. If it is not 0, check for bad insulator or some other path between the insulated moving welder part and the welder frame. Repair or replace as needed.
<span style="color: green;">READY</span> LED flashing <b>quickly</b>	Voltage on blue sensor wires is too high.	Contact Unitrol service for instructions.
<span style="color: green;">Detect Time Exceeded. Dress Electrodes</span> LED flashing	Not enough time allowed to close electrodes  Electrodes not making good contact.  Electrodes do not touch when welder air cylinder is fully extended.	Increase DIPswitch time. Remember that this maximum time is the <b>SUM</b> of all switches pushed down towards the time numbers (.25sec, .5 sec, .75sec, 1 sec)  Clean electrodes or check part being welded.  Adjust electrode holders so that there is at least a 1/4" left in the air cylinder travel when the electrodes touch.
<span style="color: green;">Output Closed Fault</span> LED is on	Output relay K4 is mechanically closed (welded contacts)	Replace K4 relay.

# 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.

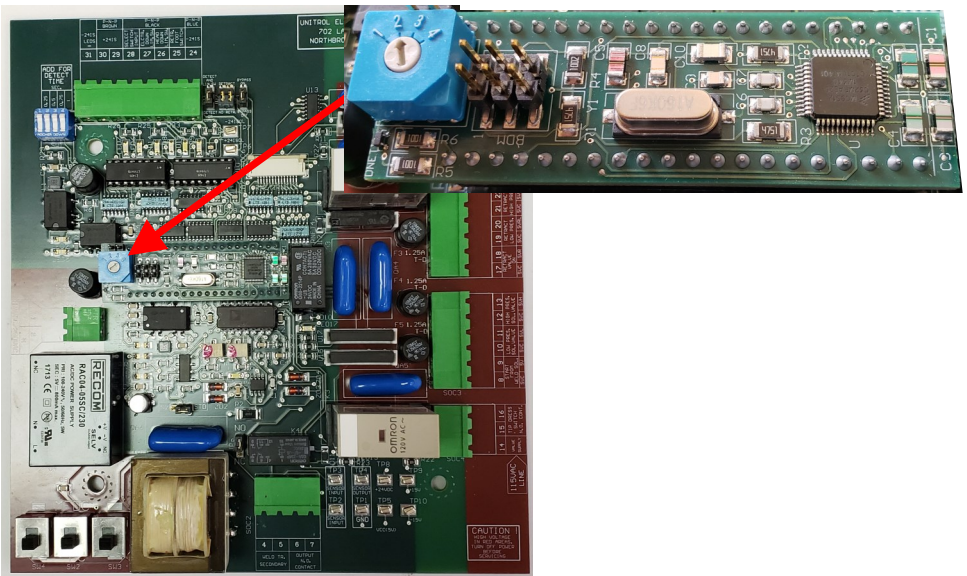
The setting positions are:

**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.

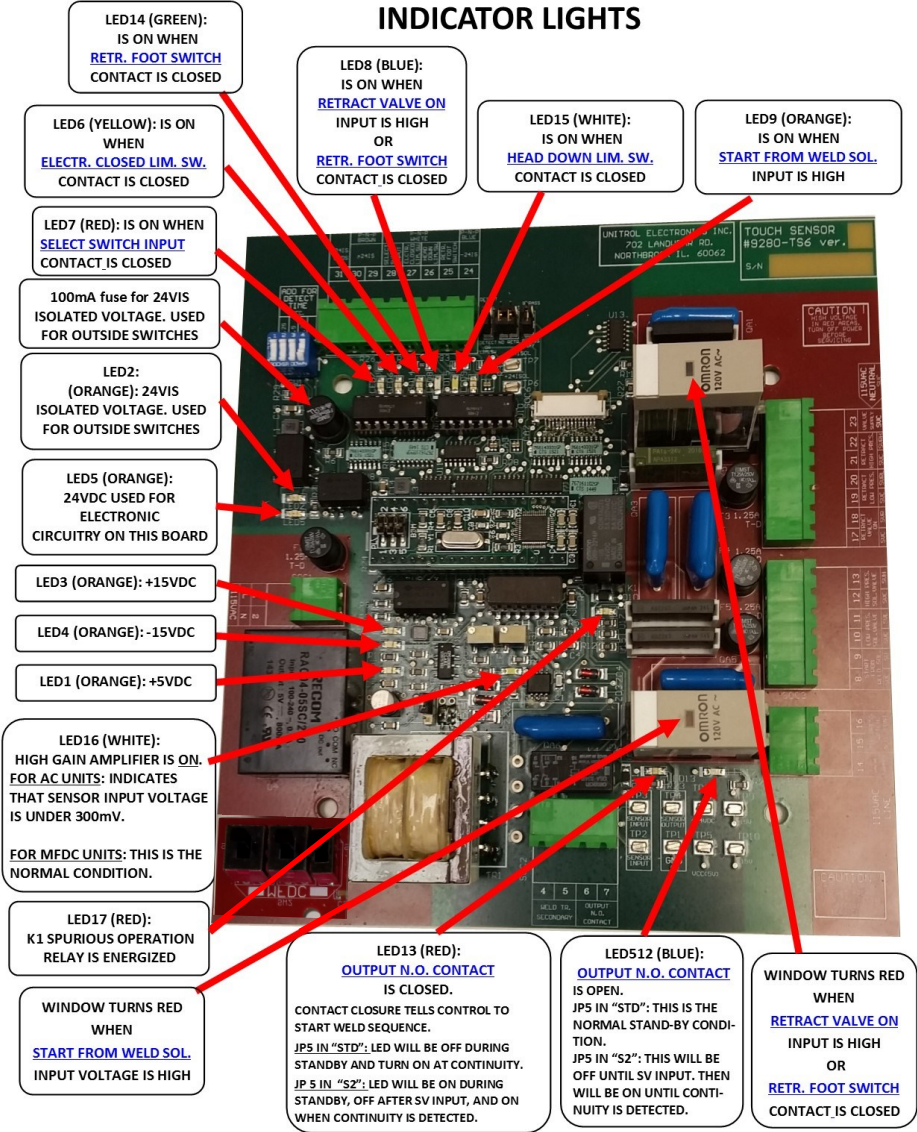
**MAKE LESS SENSITIVE:** If you are experiencing random higher-speed closing, raise the switch position 3 or position 4.





# SOFT TOUCH SENSOR BOARD TS7

## INDICATOR LIGHTS



**UNITROL ELECTRONICS, INC.**  
**702 LANDWEHR ROAD**  
**NORTHBROOK, IL 60062**  
**847-480-0115**  
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