UNITROL

SOFT TOUCH FOR PNEUMATIC RIVETERS

RST300-115-RIVET (115VAC)
RST300-230-RIVET (230VAC)

Distributed by:

ROCKFORD SYSTEMS, LLC

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MODEL:

- ☐ RST300-115-RIVET (115VAC)
- ☐ RST300-230-RIVET (230VAC)

OPTIONS:

- ☐ RST-403
- ☐ RST-404

SERIAL NUMBER:

Thank you for purchasing this Unitrol SOFT TOUCH Safety System for your pneumatic riveting machine. It is designed to protect your operator from serious 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 8:00 - 5:00 CT: 1-800-922-7533

BY EMAIL:

sales@rockfordsystems.com

BY REGULAR MAIL:

Rockford Systems, LLC
5795 Logistics Parkway
Rockford, IL 61109
USA

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.

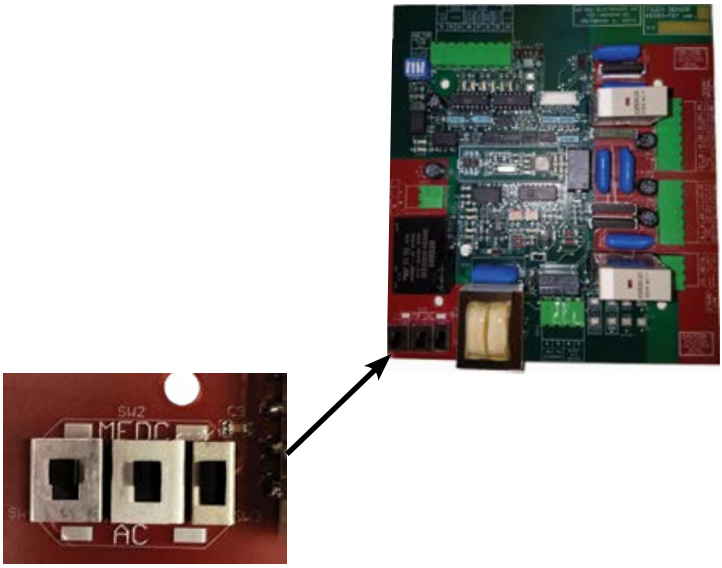
NO OTHER UNITROL ELECTRONICS INC. WARRANTY, WRITTEN OR IMPLIED, COVERS THIS CONTROL UNLESS IN WRITING AND SIGNED BY AN OFFICER OF UNITROL ELECTRONICS, INC. PRIOR TO SHIPMENT OF PRODUCT.

ROCKFORD SYSTEMS, LLC

TABLE OF CONTENTS:

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 three switches are in the MFDC (up) position.



MFDC POSITION

SOFT TOUCH PINCH-POINT SAFETY SYSTEM FOR INSTALLATION ON PNEUMATIC RIVETING MACHINES

HOW THE SYSTEM OPERATES:

When the voltage from the foot switch 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.

This closes the riveting mandrel under low force using low air pressure on the forward port of the riveter air 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 riveting mandrel 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 riveting mandrel.

If this contact 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 riveting mandrel pressure

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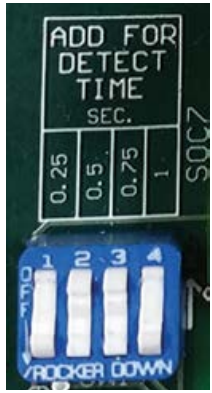
*The **maximum** time the system uses for detecting continuity is the TOTAL of the four switches set on the DIPswitch block on the upper left corner of the sensor board. Set it for about 1.5X the maximum time it takes to close the mandrel on the part.

BLANK TIME: 50% of the DETECT TIME selected will be used by the sensor board to block reaction to continuity during this time. For example, if the 1 and 0.5 DIPswitch paddles are closed (1.5 second selection), continuity in the first 3/4 seconds will not turn on the full force.

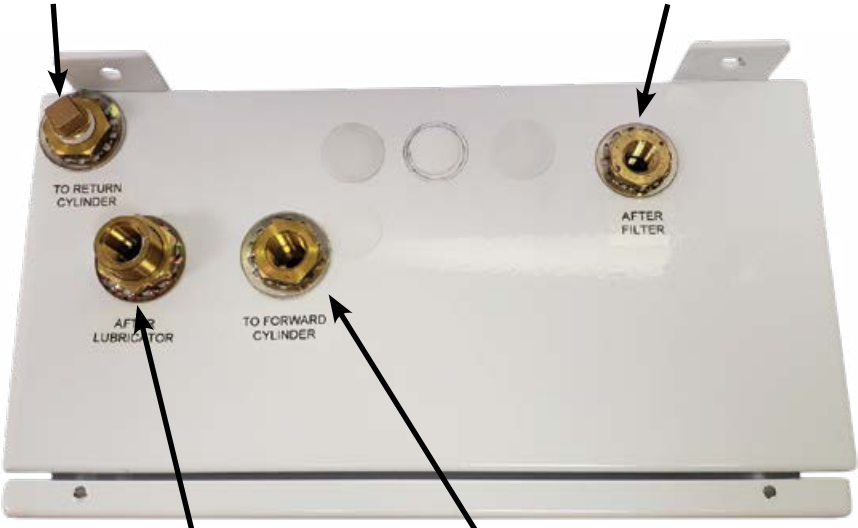


HOSE CONNECTIONS

Note: If the riveting machine has an existing solenoid valve or pneumatic foot switch, this system REPLACES these components.

Connect to air cylinder port that opens the riveting mandrel. If cylinder is spring return, install a 1/2" plug into this bulkhead.

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



Connect to point after existing airline lubricator.

Connect to air cylinder port that closes the riveting mandrel.

Install two exhaust filters, provided with this system, into the two bottom ports.

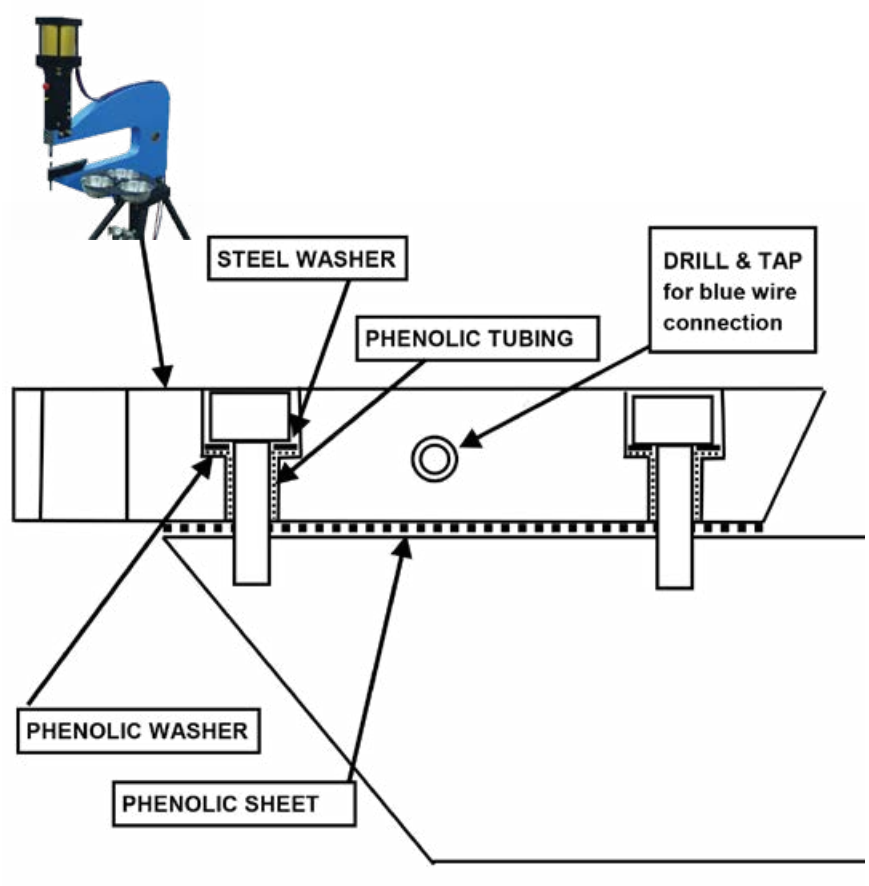
PREPARING RIVETER

Tool Bar Type Mounting

The tooling bar must be electronically isolated from the riveter frame.

Counterbore the two screw pockets in the tooling bar so that they will clear the new phenolic tubing, phenolic washers, and steel washers.

Drill and tap a hole in the tooling bar for connection to one of the blue wires from the SOFT TOUCH system.



PREPARING RIVETER

Direct Tool Mounting Type

The lower tooling must be electronically isolated from the riveter frame.

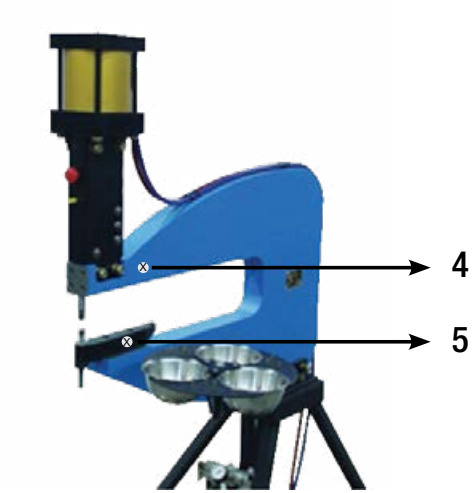
Bore out hole in bottom of riveter and install phenolic or nylon sleeve and washers.

Drill and tap a hole in the frame and install a crimp terminal with one wire as shown.

Install a copper or brass terminal pad as shown and connect the other blue wire.

CONNECTING SIGNAL PICKUP WIRES:

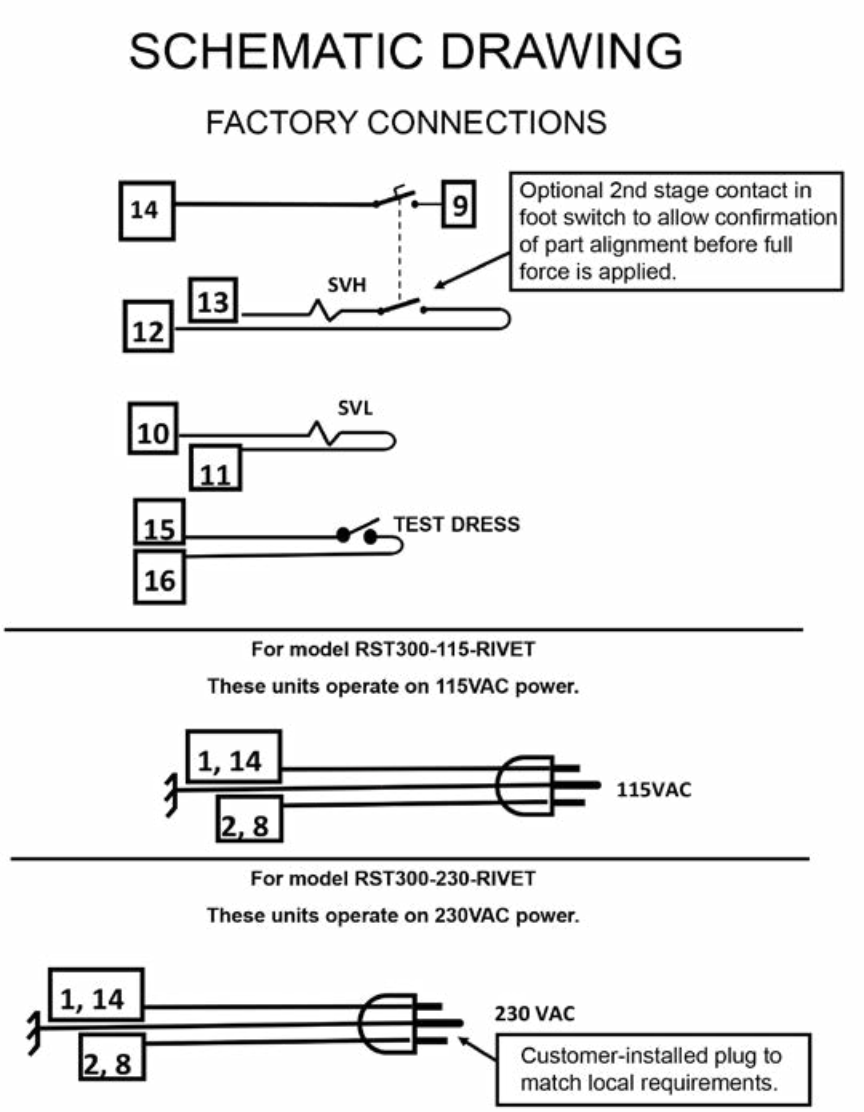
1. Connect one of the blue wires from the SOFT TOUCH cabinet to a point on the riveter frame.
2. Connect the second blue wire to the lower tool holding bar.



Connect two blue wires from the soft touch enclosure to these two points

SCHEMATIC DRAWING

Factory Connections



OPTIONAL DEPTH SWITCH RST-403, RST-404

This option allows use of either CONTINUITY DETECTION **or** closure of a DEPTH SWITCH to turn on the full rivet pressure. It is useful when parts being riveted have a non-conductive coating.

INSTALLATION:

RST-403: Mount the PNP proximity switch that is supplied with this option on the body of the rivet machine using the mounting bar. Modify and bend as needed.

RST-404: Mount a customer-supplied mechanical limit switch or PNP proximity switch on the body of the riveting machine.

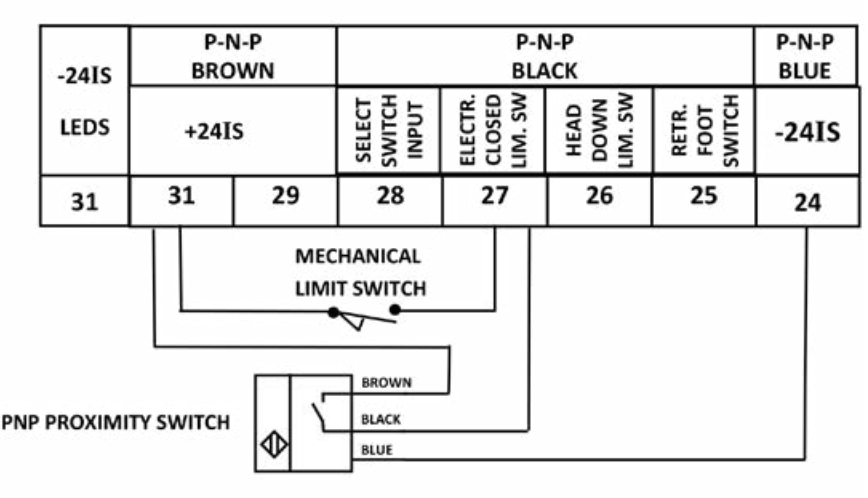
BOTH: Make and install an adjustable cam on the moving part of the riveter that will go in front of this switch when the upper riveting mandrel are less than 1/4" from the lower riveting mandrel.

NOTE: If the parts being riveted are very thick, setting the DEPTH SWITCH to close when there is a 1/4" gap between riveting mandrel might not work when the part being riveted 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 riveted to the underside of the upper riveting mandrel.

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

OPTIONAL DEPTH SWITCH RST-403, RST-404 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 riveting pressure will only be applied when electrical continuity is detected between the upper and lower riveting mandrels.

Turn the key **clockwise** to the **DEPTH SWITCH** position. The red panel indicator will glow. After initiation, the riveting mandrel 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 and the riveting mandrel will go to high force.

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

ADJUSTING THE SOFT TOUCH VALVE SYSTEM

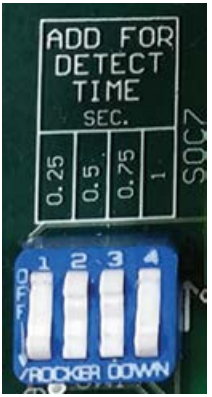
1. Set the **CLOSE** pressure regulator inside the enclosure so that the **CLOSE PRESSURE** gauge on the door is at approximately 3psi.
2. Set the **OPEN** pressure regulator inside the enclosure so that the **OPEN PRESSURE** gauge on the door is at approximately 12 psi.
3. Turn the **TEST** switch TO **TEST CLOSE**. The riveting mandrel should close. If it doesn't, **increase** the **CLOSE** pressure regulator. Check the force between the riveting mandrel 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 **TEST** switch is turned to **TEST OPEN**, the riveting mandrel open smoothly. Use the **lowest** setting on this OPEN pressure regulator that will smoothly open the riveting mandrel. This will produce the fastest mandrel 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 riveting mandrel 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.

Setting all four switches to the OFF position will set the maximum detect time to 5 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 riveting mandrel and lower tool.
2. With nothing between riveting mandrel, close riveting mandrel by turning the TEST switch at the bottom of the annunciator panel to TEST CLOSE.
3. The riveting mandrel should close. The Continuity Detected with no Start Signal LED should start flashing.
4. Turn the switch to TEST OPEN and the riveting mandrel will open.

START-UP PROCEDURE

1. Turn on power to the SOFT TOUCH 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.
5. Turn the switch to **TEST OPEN** and the riveting mandrel will open.

SUCCESSFUL SEQUENCE WITHOUT LIMIT SWITCH

1. Foot switch control sends voltage to terminal **9 (SV)**
2. **START** lights
3. Low Force solenoid valve **(SVL)** is energized, **Low Force ON** LED lights
4. Riveting mandrel close
5. Continuity is detected and **Continuity Detected** LED lights
6. High Force solenoid valve **(SVH)** is energized, High Force ON LED lights

UNSUCCESSFUL SEQUENCE

If continuity is not detected within the maximum time set on the DIPswitch, riveting mandrel will not get to full force, will open, and the **Detect Time Exceeded, Dress Riveting Mandrel** LED will light. Clean the riveting mandrel 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 riveting mandrel to close.

TESTING MANDREL CLOSING FORCE

Adjust the pneumatic system to produce safe closing mandrel closing force using the directions on page 9.

Use the TEST switch to close the riveting mandrel each time you make a change in the pressure regulator settings. A successful pneumatic setting will provide a force under 25 pounds between the mandrel and lower tool. There are two methods to check this force:

1. The most precise method is to use a tip force measuring instrument between the riveting mandrel. 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 riveting forces up to 3,000 pounds.
2. Place a wood pencil between the riveting mandrel and close using the TEST switch. The riveting mandrel 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.

TROUBLE SHOOTING CHART

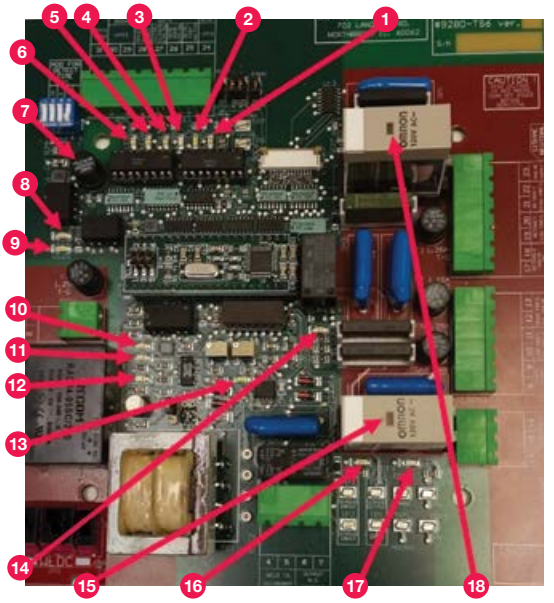
NOTE: This SOFT TOUCH system will not operate if any fault is detected. SYSTEM READY will glow solidly if faults are clear.

INDICATION	CAUSE	WHAT TO CHECK OR DO
Start LED not on **solid**	No power to control. If any fault shown below is detected. The **Start** LED will only glow solidly when the system is ready for operation.	Be sure that 115VAC (for model RST300-115-RIVET or 230VAC (for model RST300-230-RIVET) is at terminals #1 and #2.
Start LED flashing **slowly** Or **Continuity Detected with No Start Signal** LED on	Voltage on blue sensor wires too low or not connected. Insulator missing or some conducting component is connected between insulated tool bar and the riveter frame.	Switches on sensor board are not set to MFDC position. Push all three switches to MFDC position. Unplug the terminal 4,5,6,7 on the SOFT SENSOR board. Measure resistance between riveting mandrel and riveter frame If it is not 0, check for bad insulator or some other patch between the insulated tool bar and the riveter frame. Repair or replace as needed.
Start LED flashing **quickly**	Voltage on blue sensor wires is too high.	Contact Unitrol service for instructions.
Detect Time Exceeded. Dress Electrodes LED flashing	Not enough time allowed to close riveting mandrel Riveting mandrel not making good contact. Riveting mandrel doesn't touch when riveter air cylinder is fully extended.	Increase DIPswitch time. Remember that this maximum time is the addition of all switches pushed down towards the time numbers (.25sec, .5 sec, .75sec, 1 sec) Clean riveting mandrel and lower tool or check part being joined. Adjust riveter so that there is at least a 1/4" left in the air cylinder travel when the riveting mandrel touch.
Output Closed Fault LED is on	Output relay K4 is mechanically closed (welded contacts).	Replace K4 relay.

SOFT TOUCH SENSOR BOARD TS6 AND TS7

INDICATOR LIGHTS

NOTE: TS-5 BOARDS, LED6,7,8,9,14, AND 15 ARE ALL GREEN



1. **LED9 (ORANGE):** is on when **START FROM WELD SOL** input is hight
2. **LED15 (WHITE):** is on when **HEAD DOWN LIM. SW.** contact is closed
3. **LED8 (BLUE):** is on when **RETRACT VALVE ON** input is high or **RETR. FOOT SWITCH** contact is closed
4. **LED14 (GREEN):** is on when **RETR. FOOT SWITCH** contact is closed
5. **LED6 (YELLOW):** is on when **ELECTR. CLOSED LIM. SW.** contact is closed
6. **LED7 (RED):** is on when **SELECT SWITCH INPUT** contact is closed
7. **100MA FUSE** for 24VIS isolated voltage; used for outside switches
8. **LED2 (ORANGE):** 24VIS isolated voltage; used for outside switches
9. **LED5 (ORANGE):** 24VDC used for electronic circuitry on this board
10. **LED3 (ORANGE):** +15VDC
11. **LED4 (ORANGE):** -15VDC
12. **LED1 (ORANGE):** +5VDC
13. **LED16 (WHITE):** high gain amplifier is on

    FOR AC UNITS: indicates that sensor input voltage is under 300mV

    For MFDC UNITS: this is the normal condition
14. **LED17 (RED):** K1 spurious operation relay is energized
15. **WINDOW TURNS RED** when **START FROM WELD SOL.** input voltage is high
16. **LED13 (RED): OUTPUT N.O. CONTACT** is closed Contact closure tells control to start weld sequence

    JP5 IN "STD": LED will be off during standby and turn on at continuity

    JP5 IN "S2": LED will be on during standy, off after
17. SV input, and on when continuity is detected

    LED512 (BLUE): OUTPUT N.O. CONTACT is open

    JP5 IN "STD": this is the normal standby condition

    JP5 IN "S2": this will be off until SV input, then
18. will be on until continuity is detected

    WINDOW TURNS RED when **RETRACT VALVE ON** input is high or **RETR. FOOT SWITCH** contact is closed

Manufactured By:

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