

# The World's First Fully Passive Pinch Point Safety System is Now Even Better!

## UNITROL

### SOFT TOUCH

#### PINCH POINT SAFETY SYSTEM



### NEW Features:

- ▶ **Easier Setup:**  
No User Calibration, **EVER**. Just install and turn power ON.
- ▶ **Universal:**  
Works with Non-Unitrol MFDC inverter and 1 Phase AC controls. Change two plug-in relays for use with 115VAC or 24VDC solenoid valve voltage.
- ▶ **Always Ready to Protect:**  
Does not have to be calibrated even when you power-up, change material or change tooling.
- ▶ **Instantly Tunes to Your Welder:**  
**Does not stop production to recalibrate.** Automatically compensates for changes in transformer tap switch position or line voltage shifts.
- ▶ **New Look:**  
**Easy-to-Read Operation Display.** Shows exactly what is happening. Can be mounted on either side of enclosure.
- ▶ **Supports SOFT TOUCH RETRACT:**  
Just add optional RETRACT pneumatic system with HEAD DOWN limit switch for full protection.
- ▶ **Full Electrical Redundancy:**  
All inputs and outputs require closure of both electro-mechanical and solid-state redundant components for full safe operation. Self-monitors output relay to prevent any operation if a fault is detected.

### As Always, The UNITROL SOFT TOUCH:

- ▶ **Cannot Be Bypassed.**
- ▶ **Sensor Wires Always Clear of Production Area:**  
Sensor wires are connected at output of welder secondary. Never needs sensor wire location to be moved closer to the electrodes for any type of welder.
- ▶ **Fast Release:**  
Electrodes close under low force and **release in less than half of a second** if metal is not detected between electrodes.
- ▶ **Electrodes Close Without Initial Delay:**  
Electrodes start to move at the same time the welding control is initiated. **Closing speed is independent of welding pressure.**
- ▶ **Works with Ram Depth Limit Switch:**  
For redundant system requiring **both** Electrode Continuity and Ram Depth Limit Switch closure.

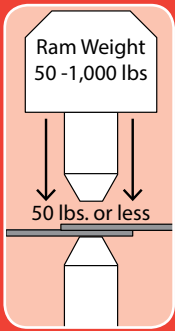


## UNITROL

RWMA<sup>®</sup>

# HOW SOFT TOUCH WORKS

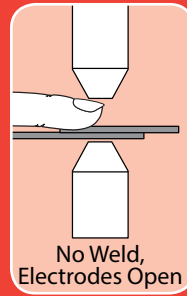
**SEQUENCE:** When the foot or hand switch is closed to start a weld:



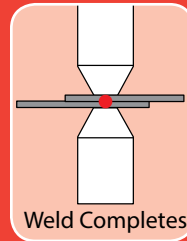
**1.** The welding electrodes close under **low force**. The unique pneumatic systems designed by UNITROL for this process can counter-balance the weight of the ram on large press welders. Even where the dead-weight of the welder ram is hundreds of pounds, the electrode force produced will be 50 pounds or less.



**2.** The welding control checks to see if metal has been detected between the electrodes within a customer set maximum time limit.



**3.** If metal is **not** detected, the electrodes open automatically and do not go to welding force. A display tells the operator the problem.



**4.** If metal **is** detected, full welding force is applied and the weld proceeds normally

## SOFT TOUCH is a Fully Passive Fail-Safe System

**TYPES OF WELDERS:** **SOFT TOUCH** can be used with all types of metals on **press welders**, **rocker-arm welders**, **portable gun welders**, and **hanging gun welders** doing **spot**, **projection** and **seam welding**.

**FULLY PASSIVE:** There are no operator adjustments. Even if electrode height or travel is changed, the **SOFT TOUCH** system continues to function without any operator changes. In fact, there is nothing for the operator to adjust.

**FAIL SAFE OPERATION:** If any of the system sensor wires become disconnected, the **SOFT TOUCH** system will lock out and not let the electrodes close or the welding sequence to proceed. If the **SOFT TOUCH** sensor board detects electrode continuity before the foot switch or hand switches are closed, the system will lock out and not allow any electrode movement.

**UNITROL** | SYSTEM READY ●

**SOFT TOUCH**  
PINCH POINT SAFETY SYSTEM  
Patent Pending

- ▶ Start
- ▶ Low Force On
- ▶ Continuity Detected
- ▶ Limit Switch Closed
- ▶ High Force On
- ▶ OK to Weld

- Detect Time Exceeded Dress Electrodes ●
- Continuity Detected with No Start Signal ●
- Output Closed Fault ●
- Retract Low Force On
- Head Down Closed
- Retract High Force On

Tip Dress ON

Tip Dress OFF

# The History Behind **SOFT TOUCH**

Several years ago, UNITROL received a panic call from a company that used a large number of our SOLUTION resistance welding controls. After two serious accidents within a six-month time period, OSHA gave them 45 days to either implement a system that would prevent pinch-point accidents on their spot welders or shut that department down. Since every part produced went through the spot welding department, this would effectively close their company, laying off over 1,000 workers.



**THE PROBLEM:** Welding their parts required that the operators' fingers had to be close to the moving electrodes. Because of the part design and large number of different models being welded, there was no way they could use drop-in fixtures and anti-tiedown hand buttons.



being welded were not flat, open surfaces. And then it was pointed out that the ring guard did not protect the operator when electrodes were being dressed or replaced. Therefore this idea was rejected.

**THE SOLUTION:** With less than 20 days left before shut-down, the company contacted UNITROL to find a solution and keep their company operating. UNITROL took up the challenge and developed **SOFT TOUCH**, a fully passive system that would not interfere with their production process.

**FIRST IDEA:** The first attempt at finding a solution was to use a **light curtain** to protect the area between the electrodes. However this idea was quickly abandoned when they realized that the operator had to hold and position parts near the electrode and would be working in the light curtain sensing zone. Also fine tuning of the light curtain safety zone would be required when new parts were welded.

The **SOFT TOUCH** system closed the electrodes under low force and only increased to full welding force after contacting the metal part being welded. The sensing system was fully electronic, could not be bypassed, and did not depend on an adjustable mechanical probe.

**SECOND IDEA:** They then found a ring guard system that mounted on the spot welder. With this type of guard, the moving electrode goes through the center of a wire loop. The loop is connected to a rod that trips a limit switch when it moves downward a certain distance. At the start of each weld, the loop is sent downward before movement of the upper electrode. If the ring is stopped by a finger or other object before reaching the top of the part being welded, the limit switch does not trip and the electrode won't close.



On presentation to the OSHA compliance officer, he pointed

out that the "safety" of this ring guard system could easily be bypassed by just loosening the adjustment screw and raising the loop upward. It was therefore not passive. Mechanically there was no way to have the ring clear most of their parts since the areas

**SOFT TOUCH** therefore satisfied the passive test required by OSHA.

As a plus, a TIP DRESS switch was included in the system to bring the electrodes together under low force during electrode dressing, replacement, or alignment procedures. **This solved the problem of operator protection during electrode maintenance.**



**THE RESULT:** The company installed **SOFT TOUCH** on one welder and it cleared the OSHA compliance officer's inspection. They installed **SOFT TOUCH** on the remaining 22 welders to bring their company back to operating on a 3-shift schedule.

*Since that time, thousands of **SOFT TOUCH** systems have been installed around the world with a 100% safety record. In the United States, all installations presented to OSHA compliance officers have been accepted.*

**TYPES OF WELDERS:** **SOFT TOUCH** can be used with all types of metals on **press welders, rocker arm welders, portable gun welders, and hanging gun welders** doing **spot, projection and seam welding.**

## SELECT A MODEL TO MATCH YOUR WELDER:

**Heavy Weight Ram:**  
**Press Welders** with force between electrodes **over 50 pounds** when all air is removed from the welder (dead weight measurement).

**Light Weight Ram:**  
**Press Welders** with force between electrodes **50 pounds or less** when all air is removed from the welder, **Rocker Arm Welders, Portable Gun Welders\*, Intensifier Cylinder Welders, and Hanging Gun Welders.**

### AVAILABLE MODELS:

Supplied with 3/4" solenoid valves for use with 2" – 8" diameter welder cylinders.

Model	Electrical Welder Type	Mechanical Welder Type	Solenoid Voltage
9181-34WB/115	1Ø AC	Heavy Weight Ram	115VAC
9181-34YB/115		Light Weight Ram	
9181-34WB/24DC		Heavy Weight Ram	24VDC
9181-34YB/24DC		Light Weight Ram	
9181-34WM/115	MFDC (inverter)	Heavy Weight Ram	115VAC
9181-34YM/115		Light Weight Ram	
9181-34WM/24DC		Heavy Weight Ram	24VDC
9181-34YM/24DC		Light Weight Ram	

\*Consult the sales department at UNITROL for additional requirements for **PORTABLE GUN (Transgun) Welders.**

**For welders with air cylinders over 8" diameter,** add the number **1** just before the / in any model number. For example, 9181-34WB**1**/115. The SOFT TOUCH systems will be supplied with 1" solenoid valves.

**For welders with air cylinders less than 2" diameter,** add the letter **S** just before the / in any model number. For example, 9181-34WB**S**/115. The SOFT TOUCH systems will be supplied with 3/8" solenoid valves.

## OPTIONS:

All options shown below can be ordered with the SOFT TOUCH system or can be easily added later in the field without modification of the control.

### BYPASS SWITCH | Model 9181-34BPA:

Used for welding materials that have high resistance coatings such as titanium oxide. Includes a two-position keylock switch with two indicator lights and faceplate. When in BYPASS position, electrodes close under low force and then switch to high force after a selectable time delay.

### RETRACT KIT | Model 9181-34JA:

Protects against pinch point injury when RETRACT brings the electrodes down to the "work" position. Will not allow closing of the electrodes for a weld until the HEAD-DOWN limit switch is closed. Does not go to full RETRACT force until **after** continuity is detected in the first weld, and then stays at full RETRACT force until the RETRACT switch is opened. Includes solid-state HEAD-DOWN proximity switch, mounting bracket and cam bracket.

### LIMIT SWITCH | Model 9181-34LSA:

Used when redundant system is required. Electrodes will not go to full welding force until **both** continuity between electrodes **and** closing of the ram limit switch. Includes a solid-state RAM POSITION proximity switch, mounting bracket and cam bracket.

### PRESSURE REGULATOR KITS:

**Model 9181-34FRL-1/2:** 1/2" NPT

**Model 9181-34FRL-3/4:** 3/4" NPT

**Model 9181-34FRL-1:** 1" NPT

Replaces existing pressure regulator, airline filter, airline lubricator and pressure gauge. This option is not required if the existing pressure regulator system is good condition.

## OSHA AND ANSI RESEARCH FOR SOFT TOUCH CONCEPT

### ANSI 12.3.2.2 Single-Ram and Single-Point Equipment.

On stationary single-ram welding machines, unless the workpiece size, configuration, or tooling (e.g., jig or fixture) occupies both of the operator's hands remotely from the point of operation during the machine cycle, operations shall be in a manner preventing injury to the operator by one or a combination of the following:

- (1) Machine guards or fixtures preventing the operator's hands from passing under the point of operation;
- (2) Two-handed controls; (3) Latches; (4) Presence sensing devices; or (5) Any similar device or mechanism preventing operation of the ram while the operator's hands are under the point of operation.

**UNITROL note:** **SOFT TOUCH matches (5) by preventing dangerous operation of the welder ram (closing of electrodes) while the operator's hands are between the electrodes.**

### OSHA 1910.212(a)(1)

Types of guarding. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by **point of operation**, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are barrier guards, two-hand tripping devices, **electronic safety devices, etc.**

**UNITROL note:** **The SOFT TOUCH sensor board is an "electronic safety device" in that it closes an electro-mechanical relay when it electronically senses that the electrodes are closed on the metal part in the work area prior to application of high force.**

### OSHA 1910.255(b)(4) (resistance welding machines)

Guarding. All press welding machine operations, where there is a possibility of the operator's fingers being under the point of operation, shall be effectively guarded by the use of a device such as an electronic eye safety circuit, two hand controls or protection similar to that prescribed for punch press operation, 1910.217.

**UNITROL note:** **The following sections are all that were recommended for this application:**

### OSHA 1910.217(c)(3)(iii)

A presence sensing point of operation device shall protect the operator as provided in paragraph (c)(3)(i)(a) of this section, and shall be interlocked into the control circuit to prevent or stop slide motion if the operator's hand or other part of his body is within the sensing field of the device during the downstroke of the press slide.

**UNITROL note:** **The electrode on the low-force ram becomes the "sensor" in this system. The "downstroke" of the welder, with the SOFT TOUCH system installed, starts when high pressure is applied to the welder ram.**

### OSHA 1910.217(c)(3)(iii)(b)

The device may not be used as a tripping means to initiate slide motion.

**UNITROL note:** **This SOFT TOUCH circuitry does not initiate any valves. It is only an input into the weld control to indicate part (finger) sensed in between the electrodes.**

### OSHA 1910.217(c)(3)(iii)(c)

The device shall be constructed so that a failure within the system does not prevent the normal stopping action from being applied to the press when required, but does prevent the initiation of a successive stroke until the failure is corrected. The failure shall be indicated by the system.

**UNITROL note:** **At the start of each stroke, SOFT TOUCH checks to see if the sensing system is closed. If it is, the sensor stroke is never started, and the control's display shows the fault. The sensor must be opened before any other action is possible on the welder.**



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