



KEEPING SPOT WELDER OPERATORS SAFE

By Roger Hirsch, President, Unitrol Electronics Inc.

WHO KNEW THAT PEOPLE WERE GETTING INJURED ON SPOT WELDERS!

I never thought spot welder safety was such a big deal until recently. Here is the story:



Last Fall we received a panic call from a company that had a large number of our Unitrol SOLUTION resistance welding controls. After two accidents in their resistance welding department within a two-month period of time, OSHA was threatening to close their welding department down if an acceptable way of guarding the welder's electrodes could not be found.

THE PROBLEM: Because of the parts being spot welded, the welder operators had to hold parts in a way that put their fingers close to the electrodes. They tried to change the fixtures so that a margin of safety was achieved, but that only slowed down production and was not even possible for the majority of parts that they welded.

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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 move parts near the electrode and would be in the light curtain zone. Also, when jobs were changed and the electrodes adjusted, very fine tuning of the light curtain system would have been required.

SECOND IDEA: They then decided to install a **RING GUARD** system. With this type of guard, a wire loop on the end of a rod is set around the top welding electrode. The loop is sent downward at the beginning of each weld before the electrode starts to move. The electrode will not close if the loop stops short of a set distance (as would happen if the loop contacted a finger).

Ring guard systems were installed on six welders and then shown to the OSHA advocate. He said this application of a ring guard would not pass an OSHA inspection. The problem was that a ring guard could be *easily* defeated by the operator. Also, he pointed out that the actual safety value of a ring guard was completely dependent on the mechanical adjustment of the wire ring by the setup person. In other words, ***the only time it was safe was when the ring was set at the proper height and the operator did not bend or rotate it out of place.***

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He explained that a safety system had to be installed that did not depend on any operator settings or adjustments. And when electrodes were changed or holders were adjusted to alter the electrode location, the safety system had to continue to operate *without the need to make adjustments*.

THE SOLUTION: Unitrol took up the challenge and developed **SOFT TOUCH**, a fully **passive** patent-pending system that provides very low electrode force when the area between the electrodes is not safe, and only applies full electrode force when it is safe to do so. This new development was done using **electronic sensing** rather than mechanical switches or moving parts.

HOW SOFT TOUCH WORKS: SOFT TOUCH is a **fully passive fail-safe system** that is controlled by the Unitrol SOLUTION welding control. Because SOFT TOUCH is part of the control and not just an add-on system, it is fully integrated into the welding sequence. This means that the system works "right out of the box" without the need to wire together and program multiple components.



SOFT TOUCH installed on a 200KVA press welder

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 ram is hundreds of pounds, the electrode force produced will be 40 lbs or less.
2. The SOLUTION control checks to see if metal is detected between the electrodes and within a maximum time. This is done from electronic signals inside the welder and does not use any external sensors.
3. If metal is **not** detected within this time, the electrodes open and remain there until the foot or hand switch has been released. At the same time, the SOLUTION display shows that the **DETECT TIME** has been exceeded.
4. If metal **is** detected within this time, full welding force is applied and the normal welding sequence is completed.

REDUNDENT SYSTEM: If desired, a limit switch can be added to the welder and adjusted to close when the space between the electrodes is less than 1/4". In this case, the SOLUTION control has to see both that there is metal between the electrodes **and** that the limit switch has been closed. This is useful where the weld surfaces on parts, such as C-shaped loops, are not touching at the start of a weld sequence and use the electrodes to push them together.

FULLY PASSIVE: There are **no operator adjustments**. Even if electrode height is changed or welding pressure is adjusted, the SOFT TOUCH system operates **without any setting changes**. In fact, there is nothing for the operator to adjust. All settings are locked in the cabinet.

THE RESULT: The company installed SOFT TOUCH on one welder, and it cleared the OSHA advocate's inspection. They eventually installed 22 systems and are back to operating on a 3-shift production schedule.

ADDING SOFT TOUCH TO YOUR WELDER: The SOFT TOUCH system is only available for installation on new and existing Unitrol SOLUTION welding controls. The kit includes a padlockable NEMA-12 enclosure that houses the precision pressure setting components, and special valves that are to be added to the welder's existing solenoid valve.

SEE THE MOVIE: You can see a short video of SOFT TOUCH as well as OSHA sightings on Unitrol's web site: www.unitrol-electronics.com.

Your Unitrol authorized distributor can help you size a SOLUTION control with the SOFT TOUCH feature for any spot welder including PRESS WELDERS, ROCKER ARM WELDERS, and TRANSGUNS.



padlockable NEMA-12 regulator box

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