

# The 3 Key Things to Consider



**WeldComputer**  
The Technology Leader in Resistance Welding

## Before You Buy or Upgrade Your Resistance Welding Machine to Avoid a Costly Decision

### Get more out of your existing resistance welding machine by upgrading your control.

If you are in the market for a new resistance welding machine, this article might save you tens of thousands of dollars. Our team collaborates with resistance welding manufacturers to help solve problems of reliability and inconsistent weld performance.

Often, the conversation becomes which machine to buy to replace their old welder. More times than not, it turns out that their existing machine can perform just as well (and often better) than a newer welding machine by simply upgrading their weld control.

But how can a 50-year-old machine deliver better performance, better reliability, and last longer into the future than a brand new machine purchased today?

We will describe how you can determine if your existing machine can achieve similar results at a fraction of the cost of purchasing and installing new resistance welding equipment.

### New does not always mean better.

Conventional wisdom suggests a new machine may perform better than an older one because of technological improvements from decades of research and development. I am here to tell you that your old machine from decades ago can still outperform a brand new machine in weld consistency, reliability, and throughput. It all comes down to your control.



Advancements in welding control and monitoring technology are the driving factors responsible for the improvements in resistance weld reliability that manufacturers enjoy today.

Upgrading your existing machine — like an old Sciaky resistance welder — with an adaptive wave synthesis control can easily enable an older machine to perform at, or better than, a brand new machine for a fraction of the cost.

To find out if this can apply to your existing machine, you need to inspect three elements:

#### 1. The Smoothness of the Moving Ram

Here is an analogy: Picture two file cabinets next to each other. One has more than 20 years of use, but the drawer tracks use roller bearings that help the drawer glide open and shut. The other file cabinet is newer with side-mount drawer slides, but when you open and close it, you can feel the metal grinding and adding friction that does not allow it to open and close as freely as the roller bearings drawer.

Even though the older drawer is decades old, it can still open and close better because it produces less friction than newer technology. Unfortunately, the same situation has become a fundamental issue with the moving ram on some of today's more recent machines. Any bit of binding and friction can lead to inconsistencies and nonlinearities in weld quality. This can be seen on any machine equipped with a WeldComputer control with monitoring.

For best welding performance, the ram must be able to move freely with low friction. Simple actions like re-machining the ram surface, replacing the roller bearings and piston, or the diaphragm can get your ram performing better than a new welding machine.

## 2. Sturdy Frame Rigidity

Frame rigidity is essential to minimize the deflection and bending of support linkages under the high electrode forces used for welding. Any inconsistencies in deflection of the lower arm can impair weld quality and consistency.

Older machine frames are generally heavier and made with more metal than many new machines. And for resistance welding consistency, heavier is better.

Machine weight allows the machine supports to deflect and vibrate less, meaning more consistent welds than a lighter, newer machine.

The takeaway: Just because a machine is newer and lighter does not mean it is better.

## 3. Transformer Characteristics

The two basic types of transformers used in welding machines are AC transformers and DC transformers.

- **AC Transformer:** The 50/60Hz AC transformer is most associated with older commercial welding machines. Many older welders for aerospace applications – like Sciaky welders – use a Three-Phase Frequency Converter transformer.
- **DC Transformer:** While there are still many old machines with three-phase DC transformers, most newer machines are now outfitted with a Medium Frequency Direct Current (MFDC) transformer. These newer machines have been most commonly outfitted with a weld control that is only compatible with an MFDC transformer.

Anyone trying to retrofit an existing machine that uses an AC transformer or Frequency Converter transformer will often be advised to replace the transformer with a new MFDC transformer or purchase an entirely new machine.

Unfortunately, this is not always the best decision for your welding application.

Not only is it expensive to rip-and-replace, but it could also result in degraded process performance and shorter lifespan compared to what can be achieved with a new wave synthesis control to drive your existing transformer.

Wave synthesis control technology ensures compatibility with any resistance welding transformer regardless of type — Frequency Converter, Single-phase, Three-phase DC, or MFDC – and will immediately improve the performance of any welding machine in any application:

- **Save on energy and power:** Inverter wave synthesis technology allows you to achieve the same power balance across a three-phase supply, and energy efficiency comparable to MFDC. An independent study from a major machine manufacturer documented 45% energy savings simply from swapping out the existing conventional control on their AC welder with a WeldComputer wave synthesis control.
- **Weld with higher precision:** Conventional SCR controls operating a 60 Hertz AC transformer or Frequency Converter transformer provide you one point of adjustment over that 16.66-millisecond cycle. MFDC systems, which typically operate at 1,000 hertz, provide 17 points of adjustment over the same cycle time. Comparing that to swapping out the control on an existing AC welder with a WeldComputer wave synthesis control, as many as 266 adjustments are performed over that same cycle time. The result is far greater granularity of control with the existing AC or Frequency Converter transformer than achievable with MFDC. More adjustment means greater precision and greater immunity from power line fluctuations.
- **Reduce welding issues:** Welding with a higher granularity of control using an AC or Frequency Converter transformer can benefit your welding process in a number of ways.
  - Shorten weld times
  - Reduce expulsions
  - Extend the life of your electrodes
  - Reduce susceptibility to damage or degradation of the transformer from things like overcurrent and momentary loss of water coolant

All of that to say your existing transformer may be superior to a new transformer in every respect. In most cases, an existing 50-year-old AC or Frequency Converter transformer can provide longer future service life than a brand new MFDC transformer.

And when combined with a WeldComputer wave synthesis control, welding operations achieve better control granularity and better reliability than using another control with an MFDC transformer.

## Your Decision: Upgrade or buy a new machine?

To review, here are the three key questions you need to ask yourself before upgrading:

***Does my current machine's ram motion perform equal or better than a new welder?***

***Does my current machine have a better frame than a new welder?***

***Does my current machine have a transformer that will work better for me and last longer into the future than the transformer in a new welder?***

If the answer to all three questions is "yes," refurbishing the old welding machine and replacing the existing control with a WeldComputer wave synthesis control may be the right choice to achieve both the best welding performance and best value.

That said, while a WeldComputer wave synthesis control is the clear top performance choice for the control, the best solution path for the machine may not be as obvious.

Sometimes a new machine has benefits that outweigh upgrading your existing equipment. After all, it takes both a top performance control and a top performance machine to deliver the highest performance welding.

## WeldComputer's experts are here to help

Our team is here to act as a trusted partner for any manufacturer looking to determine their next step. Whatever the size and scope of your resistance welding application, WeldComputer can help you select the best value machine solution for your business.

We have connections to experienced resistance welding machine designers and builders to ensure you are getting the best solution (and value) for your business. And if you do decide to get a new machine, we can help

you verify that the machine meets critically important electrical and mechanical performance standards before you sign off on the equipment.

If you're looking to mount a new resistance welding control and/or monitor on your machine to get improved performance, we can help there, too. WeldComputer manufactures the only inverter control that can drive the Frequency Converter Transformer, and deliver superior performance and reliability than achieved with MFDC systems.

We have helped many manufacturers, including the U. S. Air Force, avoid costly purchases of brand new machines by retrofitting their existing welding equipment with the controls necessary to achieve better weld consistency and uptime than they would see with brand new equipment.

If you are in the market for a new resistance welding machine, looking to replace your old welder, or are curious about the latest technology that can improve your resistance welding operation, our experts can help you determine the best course of action to meet your needs and provide the best value solution.

***Let our trusted experts help you make the right decision for your operation with a FREE consultation!***



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