AUTOMATION

The Benefits of Semi-Automated Welding and Cutting

Wel-Handy Multi with WU-1 Weaver

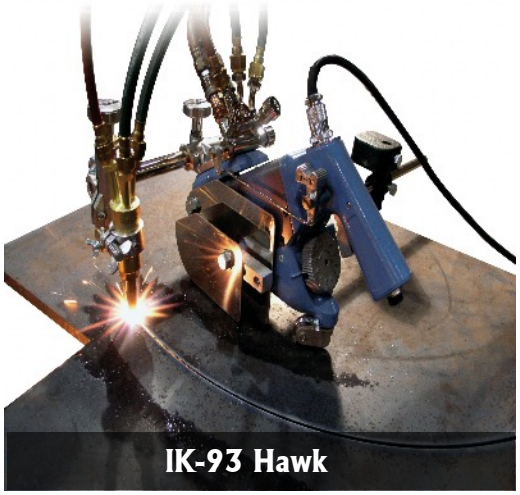
IK-12 Beetle

KOIKE ARONSON, INC. / RANSOME

Features & Benefits

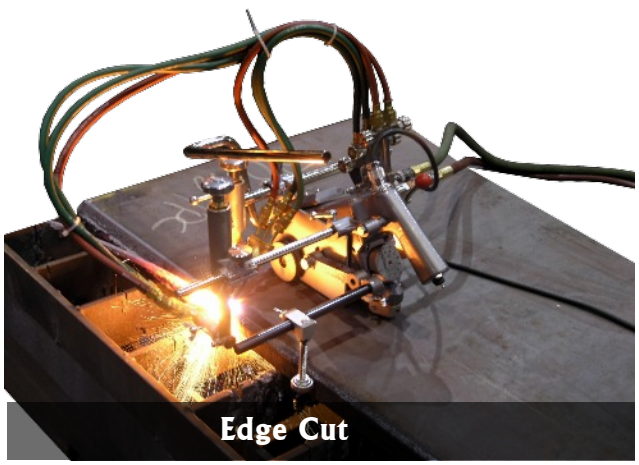
- **Arc Time**
  Reduces arc time per weldment by up to 250%
- **Overwelding**
  Filler metal usage decreased by up to 60%
- **Distortion**
  Reduces distortion and improves fit up
- **Accuracy**
  Mechanized cutting and welding reduces clean up and improves fit-up
- **Deposition**
  Maintains filler metal deposition at the highest rate possible
- **Welding Fumes**
  Fumes are reduced by up to 60%
- **Gas Usage**
  Shielding gases are reduced by up to 60%
- **Defects**
  Rework and scrap are reduced considerably
- **Worker Fatigue**
  Operator efficiency and productivity improves
- **Safety**
  Safety is increased by allowing the operator to stand away from sparks and fumes

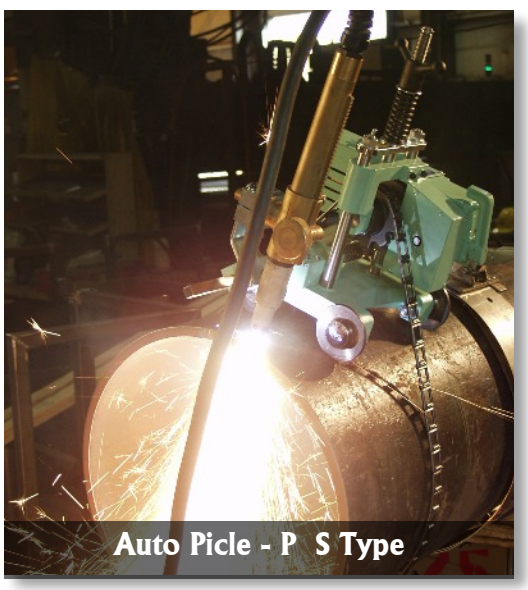
Why should I automate my cutting or welding?
Automation of welding and cutting not only improves quality and production times. It saves money in measurable ways that are very often overlooked. Our portable welding and cutting machines are used by a wide range of customers, from one man mobile welding businesses to large shipyards with hundreds of welders and cutters.


IK-93 Hawk

Semi-Automated Cutting Benefits
Semi-Automated cutting is often used to cut plate or pipe to size, add holes, shape cut and to prepare joints for welding. A wide range of benefits are attributed to high quality cuts before assembly, machining or before performing a weld.

1. Clean, square cuts with little dross and very easy to clean up. Grinding is often unnecessary.
2. Accuracy of cuts ensures good fit up and reduces the need to fill in areas with weld.
3. Bevels performed for V-grooves are at the proper angle and the root face is consistent throughout the whole length of the cut. Proper cutting prepares the surface to reduce discontinuities and minimize the amount of weld required.
4. High quality cutting can be performed with less skilled labor. Often just an operator is required after initial setup.
5. The operator's exposure to fumes, sparks, ultraviolet rays and intense heat can be minimized.
6. Operator fatigue is greatly minimized and therefore worker production increases.


Edge Cut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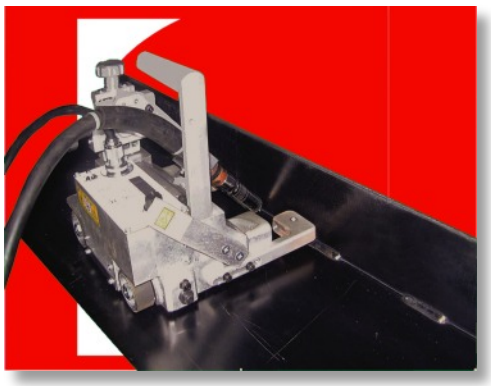
Semi-Automated Welding Benefits

Many of our current customers often find many unexpected benefits to semi-automated welding with a Koike portable machine. Often they are looking to improve quality and productivity and overlook the cost savings that can amount to thousands of dollars every month. Essentially by taking the welding gun out of the welders hand and mounting it on a welding carriage you have exact control over many of the essential variables in the welding process.



Travel Speed

Travel speed is a critical part of the welding process. Even the best welder can not achieve constant travel speed throughout the entire weld. It is typical for most welders to over weld by at least 10% as a safety against a less desirable under weld.
As the welder starts to fatigue, accuracy in welding can decrease even further. The results are both over welding and under welding. As an example, if a 1/4" fillet weld is required and the welder over welds it by just 1/16" this represents a 57% percent increase in welding wire, gases and fumes.

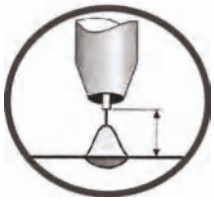
Transverse Gun

The transverse gun angle is essential in creating balanced weld legs. Unbalanced weld legs also increase over weld. In addition, the shape of the welding bead is affected and can lead to welding defects that require costly rework or scrapping of the weldment. This is a very difficult variable to control during a manual welding process versus Koike's welding carriages that maintain an exact transverse gun angle all day, every day.

Gun Travel

Maintaining the proper travel angle assures good bead shape, proper weld fusion and penetration into the base metal. Each Koike welding carriage is designed to be used in the push position or the drag position. Consistent control of this variable results in high quality welds.

Contact Tube to Work



The contact tip to work distance is also key in creating quality welds. This set distance helps assure good penetration and avoids overheating of the base metal which can create unwanted distortion in the weldment. Incomplete penetration and fusion will also result in welding defects.

Electrode Position

The electrode position is a key variable that requires careful control. Improper electrode position can create undesirable undercutting and result in incomplete fusion and/or penetration into the base metal. Again, these faults can be avoided by mechanizing the welding process.

How much money could you save?

Misconceptions about the true benefits of automated cutting and welding abound. Often it is thought that productivity and quality are the only benefits that automation can provide. Thoughts of machines running three shifts a day in order to pay-back a large capital investment may cross ones mind. However, nothing could be further from the truth. In fact, Koike's line of semi-automated portable cutting and welding carriages prove that automation is affordable and makes sense.

One of our many customers describes Koike's portable Wel-Handy Multi carriage:

"Basically, we were able to take the hand torch from the welder and mount it on the carriage. It was really that simple! We were able to use the same welding settings, only now the welder was able to concentrate on the actual weld without becoming fatigued. The most obvious increase in production was the amount of weld that was done in a day. The same welder that was producing 110 feet of weld a day was now able to produce 250 to 300 feet of weld a day. As the semi-automated system was used, we discovered new benefits that provided a tremendous amount of cost savings and improved our operators working environment"

The below example is designed to provide a simple example of cost savings. Additional cost savings are realized as productivity improves, clean up is minimized and rework is reduced. The welder is thereby able to keep non-arc time to a minimum. In general, working conditions for the welder improve by reducing worker fatigue and minimizing exposure to sparks and fumes.

Fillet Weld Flux Core Arc Welding	1/4"	5/16" (1/16" over weld)	Savings
Length of Welds	3,000 ft	3,000 ft	–
Filler Needed	427.60 lb.	704.06 lb.	272.46 lb.
Total Arc Time	94 hrs.	166 hrs.	72 hrs.
Labor Cost + Overhead	$45/hr.	$45/hr.	–
Total Gas Cost	$136	$242	$106
Wire Cost per lb.	$1.90	$1.90	–
Total Labor Cost + Overhead	$4,234	$7,470	$3,236
Total Wire Cost	$812	$1,338	$526
Total Cost	$5,182	$9,050	$3,868

Give us a call and let us show you how we can make metal-working more profitable for you.

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