



WELDING TECHNOLOGIES



# Welding Control Systems

Quality Without Compromise

# Controls

## About

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As a world leader in welding equipment and welding systems for the automotive industry for more than half a century, ARO is a name which has become synonymous with resistance welding. Clients choose ARO for its proven superiority in state-of-the-art technology, reliability and quality without compromise.

Based in Montval-sur-Loir near Le Mans in France, ARO has a worldwide presence, with branches and production sites in Europe, Asia and North, Central and South America delivering a complete range of services to international customers.



ARO Controls, Montval-sur-Loir, France.



ARO headquarters, Montval-sur-Loir, France.

### Electronics

ARO Controls is the electronics division of ARO and is a world-renowned specialist in resistance weld controls. Located next to ARO headquarters, ARO Controls' state-of-the-art facilities have been specifically developed for the design and manufacture of weld controls.

ARO's continuous programme of research and development embrace the latest technologies to deliver high performance, high quality products at the best possible prices.

#### Our main areas of expertise are:

- Industrial electronics
- Embedded software
- Networking software
- Power electronics
- Motion control
- Electrical cabinet design
- EMC (electromagnetic compatibility)
- PLC programming





# DC Welding

ARO's highly automated control systems have been carefully designed to deliver optimum weld quality alongside maximum adaptability and greater cost savings.

## MFDC Controllers and Cabinets

ARO offers a comprehensive range of MFDC (Medium Frequency Direct Current) inverters with embedded controllers, designed to provide high welding performance under severe conditions.



Built around these Inverters (560A – 800A – 1200A – 2400A), MFDC cabinets can deliver welding currents up to 100 kA, and cover all welding applications:

## Robotic Welding

Compatibility with field buses used in the welding sector (Profinet, Ethernet IP, DeviceNet, Profibus DP, and Interbus-S) provides easy and efficient integration into robotic or automated applications.



Welding current up to 100 kA.

## Manual Welding

ARO welding cabinets are able to manage two manual guns with one or two operators. Investment is therefore drastically reduced while workshop space is saved.



Welding current up to 60 kA.

## Stationary Welding

The wide variety of welding applications with stationary machines is managed by ARO cabinets through numerous programming functions (fast welding, cascade function, roller seam, etc.).

### Benefits

- Energy savings
- High welding currents
- Compact design
- Easy programming via pocket or laptop
- Maximum flexibility and safety
- USB and Ethernet connections for configuration and calibration by computer (laptop or network)
- Field bus communication with robots and PLCs
- Wide choice of options

To guarantee superior weld quality, ARO's Adaptive Welding (AW) can be activated, and, for robotic applications, associated with SQA (Steel Quality Assurance), an innovative process monitoring software.

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For more than 70 years, the name ARO has been synonymous with resistance welding

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Welding current up to 100 kA.

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ARO Controls' cabinets have been used in thousands of installations worldwide

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### Adaptive Welding

Through extensive research and development, ARO has designed an intelligent and efficient control system known as Adaptive Welding (AW). This revolutionary system automatically compensates for process variations to guarantee a far superior weld quality.

Startup and implementation of AW are very simple and intuitive. No specific skill is required: AW is automatically activated after a fast 'learning' phase on a few weld spots. In manual welding, risk of operator error is eliminated, as only one program is necessary for all sheet combinations.

#### Features

- Automatically adapts to changes in material
- Automatically adapts to the presence of resistive materials (glue, etc.)
- Automatic compensation of electrode wear
- Automatic compensation of shunt effects

#### Benefits

- Improved weld quality
- Accelerated equipment start-up (time & cost savings)
- Reduced documentation and maintenance of welding schedules (cost savings)
- Drastic reduction of spatter and expensive reworking
- Reduced off-line quality control expenses
- Easier welding of complex materials (boron steel, TRIP, dual phase, etc.)

### SQA (Steel Quality Assurance)

The SQA option makes a statement about the quality of each weld spot. When a bad spot is detected, it can be automatically re-welded. SQA ensures the stability of the process thanks to a comprehensive online weld quality monitoring.

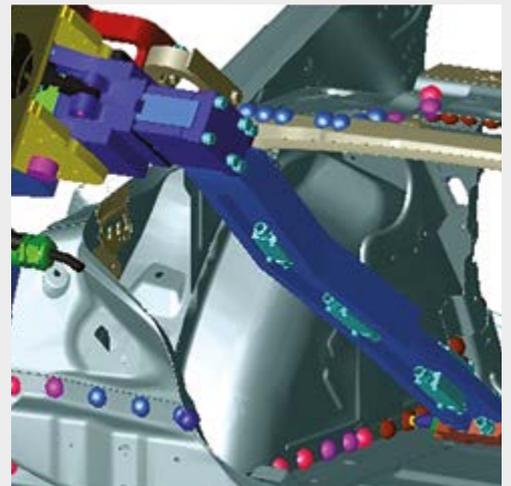
#### Features

- Detection of process disturbances
- User defined QA thresholds
- Easy setup

Compatibility with both standard and AW modes.

#### Benefits

- Cost savings through the reduction of destructive and non destructive tests
- Reduction of production line stops thanks to better anticipation of any troubleshooting





# AC Welding

ARO has, for many years, been recognised as a specialist in AC welding. ARO's proven Control System with its user-friendly and robust interface has been incorporated into many thousands of welding systems around the world.

## Robotic Welding Applications

ARO offers a comprehensive range of robot cabinets compatible with the majority of field buses used in the welding sector such as Interbus-S, DeviceNet, Profibus DP, Profinet and Ethernet IP, therefore facilitating the integration into a robot application. The cabinet is designed to be installed on top of the robot cabinet (any brand), saving floor space.



## Manual Welding Applications

### T1400

The T1400 is a sophisticated, compact welding cabinet based on a standardised design that ensures reliability and safety. It can operate one or two manual guns.



### Features

- Power: 75kVA at 50%
- Network voltage from 380V to 480V
- Up to 60 welding schedules
- Programming via pocket or laptop

Can be networked with ARONET.

## AR01

The AR01 control cabinet stands out for its simplicity and its intuitive HMI. Developed specifically for extreme industrial applications, it can be installed rapidly and simply thanks to the regrouped connections on the back of the unit.



### Features

- Power: 32 or 56 kVA
- Network voltage from 230V to 460V
- 50/60 Hz

## Stationary Machine Applications

ARO welding cabinets offer many functionalities (seam welding, multi welding, cascade function, etc.) to address all welding applications with stationary machines.



### Features

- Power: 36 to 550 kVA
- Network voltage from 200 to 690V
- 50/60 Hz
- Up to 128 welding schedules
- Programming via a pocket or laptop

Can be networked with ARONET.

The world's  
AC welding  
control systems  
of choice

# iBox: Servo Management

iBox: time,  
current and force  
all centralised into  
one powerful  
process controller

For servo-actuated guns and machines, iBox centralises all resistance welding parameters into one process controller!

Programming and monitoring of all welding parameters (time, current, force) are regrouped in just one cabinet, clearly delimiting responsibilities between the robot and the welder.

As a result, almost any 6-axis robot (pneumatic welding, handling, refurbished, etc.) can manage a servo weld gun with just a small modification to its application software. Similarly, any PLC can drive a servo weld gun or servo machine.

Thanks to its position sensing and force sensor management capabilities, iBox provides advanced functionalities that improve the welding process and quality.

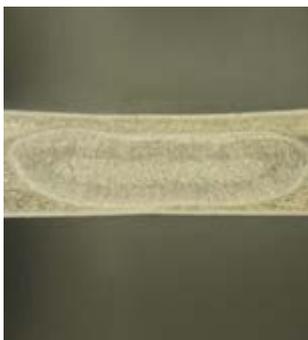


## Benefits: Weld quality

- Welding of demanding materials such as Aluminum, titanium, stainless steel, etc.
- Weld spot repeatability thanks to constant force applied to the electrodes
- Verification of spot indentation and nugget expansion
- Elimination of cracks and porosities in the weld nugget through force step management
- Reduced risk of spatter: force control limits compression of the melted nugget during the welding cycle
- Improved electrode dressing: force control provides for a more accurate dressing to restore the original properties of the electrode's active surface

## Features

- Force control and monitoring
- Force regulation
- Force profiles
- Current / Force synchronisation
- Gap compensation
- Measurement of indentation and nugget expansion
- Optional Servo Equalising management

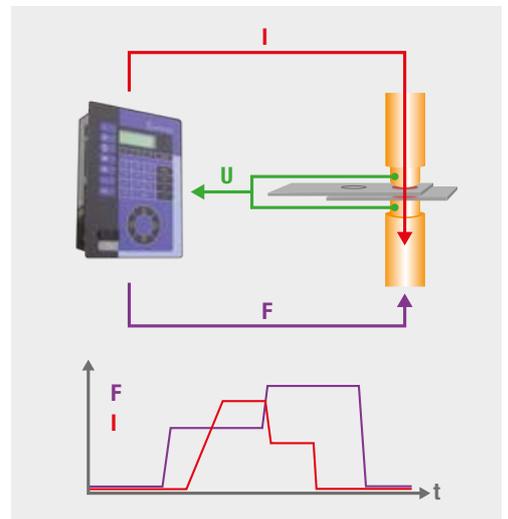


Good nugget.

iBox is available in MFDC and can deliver up to 465 kVA with a 100kA inverter.

## iBox can manage:

- Robot guns
- Stationary machines
- Manual servo guns





# Software

ARO software solutions help streamline production and maximise welding efficiency.

## ARONET

ARO weld controllers can be networked to a central computer running the ARONET software. All the functions of each and every welder can then be accessed in real time on the central computer.

Weld settings can be directly imported from the end-user weld database into the welding controllers.

ARONET can be customised with options such as PART MANAGER to deliver complete reports for each part welded, or SQA for spot by spot process monitoring.

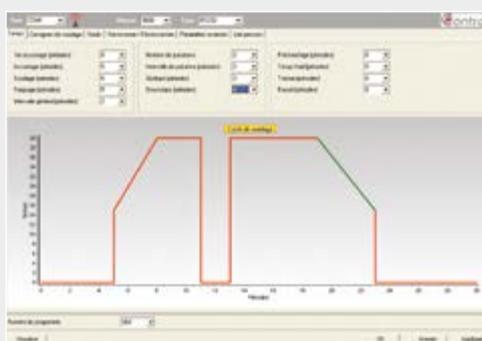
### Benefits of ARONET

- Increased workshop availability
- Traceability of all events and weld results for process improvement and quality assurance
- Powerful and user-friendly interface

These benefits make ARONET a perfect choice for optimised production, quality and maintenance.

## ARODMS

ARODMS is an easy to use off-line programming and archiving software. Weld schedules can also be printed for reference.



### Compatibility

ARONET and ARODMS software are compatible with the most widely used versions of Microsoft Windows, on 64-bit computers and laptops.

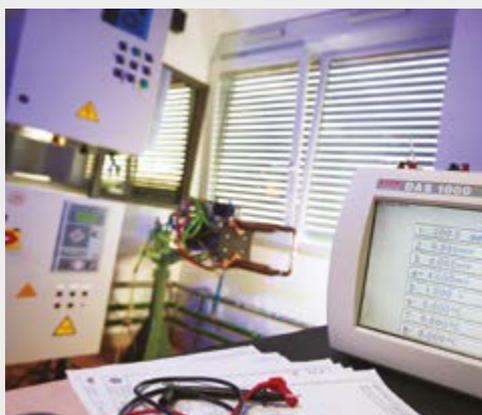
### ARO Service

Complementing ARO's worldwide network of subsidiaries and agents is the ARO Controls service team who provides expert customer support across the globe at every project level, from application consultancy and welding expertise to after sales service and training.

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ARONET:  
The perfect choice  
for optimised  
production

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WELDING TECHNOLOGIES

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Doc. C823GB - 0419 / Issue 2. Due to a policy of continued improvement, we reserve the right to change any specification without prior notice. ERRORS & OMISSIONS EXCEPTED.  
Printed on a Manroland R700 press.



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