

# Magnetic Arc Control Systems



The Cyclomatic Series Magnetic Arc Control has been redesigned to provide the stability and precision a microprocessor control offers.

Two new microprocessor controllers are available: Model 8020 is compatible with four older style probes; Model 8040 dual axis controller uses the 4613A probe.

Magnetic arc control provides even heat distribution, prevents undercutting, eliminates excessive porosity, ensures sufficient penetration, and evens out the weld puddle. Combined with a magnetic probe, a magnetic field is created around the arc to precisely position, oscillate, and stabilize it.

The Magnetic Arc System bolts onto your present automatic or semi-automatic welding torch and goes immediately to work solving some of welding's toughest problems. By adding stability and control over arc oscillation and positioning, the Magnetic Arc Control ensures a quality weld, even when welding on exotic metals.

## Specifications

| Control Unit  | Model 8020   | Model 8040   |
|---------------|--|--|
| Sweep         | Adjusts speed of oscillation, 1-50 oscillation per second                          | N/A  |
| Frequency     | N/A  | Adjusts speed of oscillation, 1-50 oscillation per second  |
| Amplitude     | Magnetic Field Strength Adjustment, proportional to arc length (approx. ratio 1:1) | Independent Arc Placement Adjustment for each axis, proportional to arc length (approx. ratio 1:1) |
| Position      | Arc Placement Adjustment, proportional to arc length (approx. ratio 1:1)           | Independent Arc Placement Adjustment for each axis, proportional to arc length (approx. ratio 1:1) |
| Dwell Ratio   | 1:1 to 100:1 on eight side of weld seam  | NA   |
| Dwell Control | Independently variable left and right  | NA   |
| Final Taper   | Reduces Magnetic Field Strength (Amplitude) from 0-15 seconds to match downslope   | Reduces Magnetic Field Strength (Amplitude) from 0-15 seconds to match downslope                   |
| Input Power   | 115/220 VAC, 50/60 Hz  | 115/220 VAC, 50/60 Hz  |
| Cooling       | Air/convection   | Air/convection   |
| Dimensions    | 9.75 x 4 x 11.75 (248 x 102 x 300 mm)  | 9.75 x 4 x 11.75 (248 x 102 x 300 mm)  |
| Weight        | 12 lb (5.4 kg)   | 12 lb (5.4 kg)   |

# CYCLOMATIC SERIES MAGNETIC ARC CONTROL



### 4604 Magnetic Probe

This single tip, water-cooled probe works well in tight clearances and adapts to conventional torches.



### 4608C Magnetic Probe

This dual tip probe slips over a conventional TIG torch and can be used either for cross-seam weaving or in-line weaving.



### 4613A Magnetic Probe

With four independently controlled magnetic coils, the 4613A probe has the highest capacity for multiple arc and weld bead profiles. This probe, coupled with the 8040 Controller, provides the ability to shift the entire arc pattern relative to the weld seam with position controls.



### 4615 Magnetic Probe







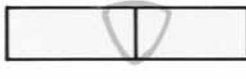









This twin-tip, side mount probe is capable of delivering the full 600 gauss magnetic field to the welding arc.

| Magnetic Probe           | 4604                    | 4608C                   | 4613A                   | 4615   |
|--------------------------|-------------------------|-------------------------|-------------------------|--|
| Max Field Strength       | 300 gauss max           | 300 gauss max           | 300 gauss max           | 600 gauss max  |
| Cable Length             | 8 ft (2.5 m)            | 8 ft (2.5 m)            | 10 ft (3 m)             | 10 ft (3 m)  |
| Weight                   | 5 lb (2.3 kg)           | 4 lb (1.8 kg)           | 5 lb (2.3 kg)           | 7 lb (3.2 kg)  |
| Controller Compatibility | 8020                    | 8020                    | 8040                    | 8020   |
| Standard Tips            | 1030-0096<br>1 required | 1033-0203<br>2 required | 1030-0657<br>4 required | 1030-0240 left<br>1030-0231 right<br>1 each required |

Probe extensions, tip extensions, and custom tips are available for some probes; contact the factory for details.

# CYCLOMATIC SERIES MAGNETIC ARC CONTROL

Cyclomatic's Magnetic Arc Control System solves the five main problem areas of automatic arc welding. Any one of these problems can result in an unsatisfactory weld. This is especially so when exotic alloys are fabricated and when the end product is subjected to elevated temperatures, high pressures, unusual stress, or vibration patterns.

| PROBLEM   | SOLUTION  |  |
|---|---|--|
|  <p>Arc blow or wander causing misplaced bead and unsatisfactory penetration.</p>  |  <p>Uniform penetration achieved with Cyclomatic's control system.</p>   | <p>Cyclomatic's ability to control and direct the arc and control heat distribution between the parts being joined significantly improves uniformity of penetration and provides consistent, uniform welds.</p>  |
|  <p>Large gap causing excessive drop-through and root-side undercut.</p>   |  <p>Uniform penetration achieved with Cyclomatic's control system.</p>   |  |
|  <p>Sharp crevices in butt weld.</p>  <p>Flat fillet with sharp crevices on both members.</p> |  <p>Minimize undercutting with Cyclomatic's control system.</p>                 | <p>Cyclomatic solves these problems by sweeping the arc back and forth across the desired weld line, thereby directing the required amount of heat to the weld edges, which widens and flattens the bead.</p>  |
|  <p>Lack of fusion in V and U grooves.</p>    |  <p>Uniform sidewall fusion achieved with Cyclomatic's control system.</p>  | <p>Inadequate sidewall fusion in multipass groove joints is prevented by the capability of the Cyclomatic to oscillate the arc in the groove, directing the thermal energy to the desired position.</p>  |
|  <p>Typical porosity caused by gaseous products generated in melted base metal.</p>  |  <p>Sound welds achieved with Cyclomatic's control system.</p>   | <p>The stirring action of the oscillator will materially aid in the elimination of porosity and its resultant defects, regardless of cause.</p>  |
|  <p>Insufficient heat on thick member prevents proper penetration and fusion to thin member.</p>   |  <p>Uniform penetration on thick and thin members with no undercutting — with Cyclomatic's control system.</p>   | <p>Cyclomatic's ability to control the proportion of time the arc dwells on either side of the desired weld line makes it possible to place the welding energy exactly where it is needed to achieve uniform penetration and eliminate undercutting when members of different cross sections are joined.</p> |

# CYCLOMATIC SERIES MAGNETIC ARC CONTROL

## Ordering Information

| Part Number  | Description   |
|--|---|
| <b>System Packages</b>   |   |
| 8020-4604  | Model 8020 Control with 4604 Probe  |
| 8020-4608C   | Model 8020 Control with 4608C Probe   |
| 8020-4615  | Model 8020 Control with 4615 Probe  |
| 8040-4613A   | Model 8040 Control with 4613A Probe   |
| System packages consist of: <ul style="list-style-type: none"> <li>• Microprocessor control unit with 7.5' (2.3 m) power cable</li> <li>• Probe assembly with 8' (2.4 m) or 10' (3.3 m) cable</li> <li>• 12' (3.6 m) remote interface cable</li> <li>• Operators manual</li> </ul> |   |
| Extension cables are available - contact Jetline for further details.  |   |
| <b>Individual Components</b>   |   |
| 043511   | Model 4608C Probe with 8' (2.5 m) cable   |
| 043512   | Model 4604 Probe with 8' (2.5 m) cable  |
| 043515   | Model 4615 Probe with 10' (3.3 m) cable   |
| 043571   | Model 4613A Probe, 2 Axis, with 10' (3.3 m) cable (for use with the 8040 control) |
| Probe assemblies include standard probe tip(s), attachment links, torch clamp, and water hoses with fittings.  |   |
| 8020   | Single Axis Control Unit  |
| 8040   | Dual Axis Control Unit  |

See Jetline price list for complete ordering information

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engineering

An Illinois Tool Works Company

15 Goodyear St., Irvine, California 92618 USA

Tel: (949) 951-1515 • Fax: (949) 951-9237 • E-mail: sales@jetline.com

Web Page: [www.jetline.com](http://www.jetline.com)

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Dimensions and specifications are subject to change without notice.

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