



**Millermatic<sup>®</sup>  
MIG  
Welding  
Buyer's  
Guide**

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# Your Personal Guide To MIG Welders

From farmers to metal fabricators, home mechanics to professional motorsports champions — these experts all choose MIG welders to build and repair equipment. MIG welding is easy to learn, makes great welds on a variety of metals, gets the job done quickly, and is cost effective.

But which welder is right for you? Miller Electric put together this buyer's guide to help you make an informed decision. This guide shows you how to select the welder that best satisfies your needs, answers many frequently asked questions, and provides a detailed description of Miller's line of Millermatic® All-In-One MIG welders.

## The Original All-In-One MIG

Miller Electric invented the Millermatic back in 1971. We combined a MIG power source, wire feeder and gun into a single package, dubbing it an All-In-One welder. Today, you can choose from a variety of different brands, but none reflects nearly three decades of continuous Millermatic innovation.

By listening to what you want, we've made the best better. Millermatic — the All-In-One MIG leader.



# Selecting A MIG Welder



## Why Should I Buy A MIG Welder?

A MIG welder, sometimes called a wire welder, creates an arc between a continuously fed filler metal (consumable) electrode and the weldment. Advantages of MIG welding include:

- Welds light-gauge material or thick plates.
- Welds all common metals — carbon steel, stainless steel and aluminum.
- High welding speeds. Up to four times faster than Stick, and nearly double the metal deposition rate.
- Less smoke and no slag to chip off.
- An easy process to learn.

## Can MIG Equipment Also Be Used For Flux Cored Welding?

Yes — just switch the polarity links near the drive system and change from solid wire to flux cored wire. The advantages of Flux Cored welding are:

- Works as well as Stick on rusty or dirty material.
- Deep penetration for welding thick sections.
- Portability; can eliminate need for a shielding gas bottle by using a gasless flux cored wire.
- Gasless, also known as self-shielded flux cored wire, is better suited for outdoor work.

## How Much Amperage Do I Need?

One way of classifying welders is by how much *amperage* they can generate at a given *duty cycle*. Basically, amperage equals heat. Some approximate amperages for MIG welding mild steel are:

Thickness	Amperage
18 gauge	70 – 100
1/8 in	120 – 200
3/16 in	140 – 205
1/4 in	140 – 225
1/2 in	250+

*Note: Amperage requirement varies with wire size, welding position, joint and shielding gas being used.*

## Does Input Power (115 Or 230 Volts) Make A Difference?

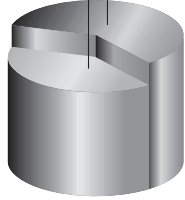
Yes, because power in equals power out. A welder with 230 V/30 amps of input can weld thicker materials than a 115 V/20-amp welder.

## What Does “Duty Cycle” Mean?

Duty cycle is the amount of time during a 10-minute period that a welder can operate at a given amperage without overheating. For thicker metals or bigger jobs, choose a welder with a higher duty cycle.

**Rest Time**  
4 Minutes

**Run Time**  
6 Minutes



**60% Duty Cycle**

## Do I Want A Welder That Can Run Different Wire Diameters?

Yes, for versatility. Using thinner wires, such as .023 or .030 in, prevents burn-through on thin materials. Conversely, using thicker wires, such as .045 in, can help ensure excellent fusion on thicker metals.



## Can Any MIG Unit Weld Aluminum?

No. Aluminum requires a faster wire feed speed because it melts so quickly. If you plan to frequently weld aluminum, use a specially designed MIG welding power source like the Millermatic® Pulser or a special aluminum feeding gun like a Spoolmatic® 30A or Spoolmate™ spool gun paired with a Millermatic 251 or Millermatic 210 power source.



**Spoolmatic 30A**

The Millermatic Pulser is the only all-in-one unit designed to pulse MIG weld thin aluminum to reduce burn-through, minimize distortion and ensure good fusion, even on aluminum as thin as 19 ga.

For the smaller Millermatic power sources like the Millermatic 135 and 175, the optional SGA 100 adapter and Spoolmate™ 3035 spool gun are available for your aluminum applications.



**Spoolmate 3035**

## Can I Use One Shielding Gas For Every Metal?

No. While many people weld on mild steel with straight CO<sub>2</sub>, only a few machines produce good welds with low-spatter (notably the Millermatic 135). Most mild steel applications call for a mixture of 75% Argon and 25% CO<sub>2</sub>, commonly called “75/25.” Aluminum requires pure Argon, whereas stainless steel welds best with a tri-mix.

# Millermatic® Product Specifications

ORIGINAL ALL-IN-ONE MIG PRODUCT	THINNEST – THICKEST* MATERIAL WELDED	AMPERAGE RANGE	DUTY CYCLE
Millermatic® 135	24 ga. – 3/16"	30 – 135 A	90 A at 20%
Millermatic® 175	24 ga. – 1/4"	30 – 175 A	130 A at 30%
Millermatic® 210	22 ga. – 3/8"	30 – 210 A	160 A at 60%
Millermatic® Pulser	19 ga. – 3/8" alum. 22 ga. – 3/8" steel 20 ga. – 3/8" stainless	30 – 200 A	200 A at 30%
Millermatic® 251	22 ga. – 1/2"	30 – 300 A	250 A at 40% 200 A at 60%
Millermatic® 300	22 ga. – 1/2"	40 – 350 A	300 A at 60% 240 A at 100%

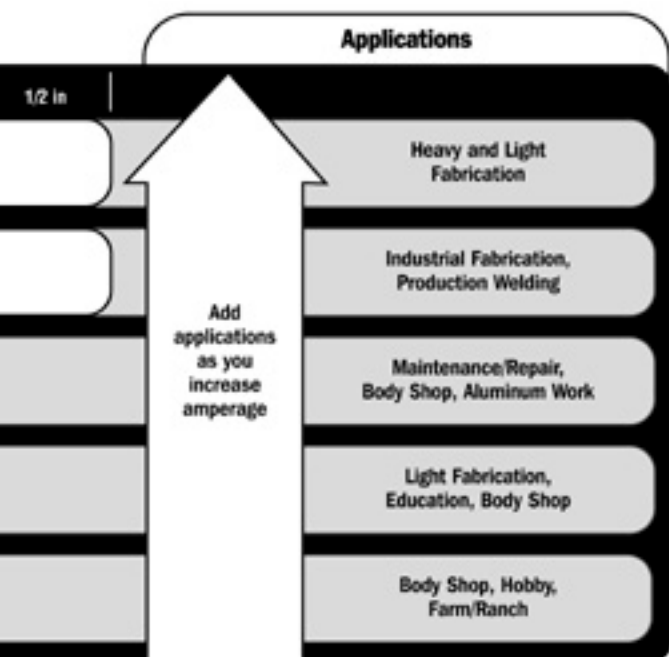
\*Thickest material welded in a single pass.

## Thickness of Material Welded in a Single Pass

Amperage	Thin Gauge	3/16 in	1/4 in	3/8 in
High, 3-Phase	<b>Millermatic® 300</b> 208/230/460 VAC, 60 Hz • 575 VAC, 60 Hz 277 lbs • Spool Gun Ready			
	<b>Millermatic® 251</b> 208/230 VAC, 60 Hz • 230/460/575 VAC, 60 Hz 215 lbs • Spool Gun Ready • Optional Push-Pull Module			
Medium, 1-Phase	<b>Millermatic® 210</b> 208/230 VAC, 60 Hz 200 lbs • Spool Gun Ready		<b>Millermatic® Pulser</b> 208/230/240 VAC, 60 Hz 460/575 VAC, 60 Hz • 225 lbs	
	<b>Millermatic® 175</b> 230 VAC, 60 Hz • 73 lbs			
Low, 1-Phase	<b>Millermatic® 135</b> 115 VAC, 60 Hz • 60 lbs			

APPLICATIONS	TRUE BLUE PAYOFF
Hobby, Body Shop, Farm/Ranch	Combined wire feed speed and infinite voltage control with Wire Feed Speed Tracking.
Light Fabrication, Education	Combined wire feed speed and infinite voltage control with Wire Feed Speed Tracking.
Light Fabrication, Auto Body, Maintenance/Repair, Aluminum Work	More power, soft arc. Seven taps for better high- and low-end control. Gun-On-Demand™
Farm, Sign Manufacturing, Light Fabrication and Repair, Aviation Repair, Auto Body	Most affordable pulsed MIG unit available. Ensures good fusion, eliminates burn-through and warping.
Heavy and Light Industrial Welding, Aluminum Work	Active Arc Stabilizer™ and adjustable run-in speed control provide industry's best arc starts, low-end arc stability. Gun-On-Demand™
Heavy and Light Industrial Welding, Aluminum Work.	Three-phase input power for smooth weld output, low amp draw. Gun-On-Demand™

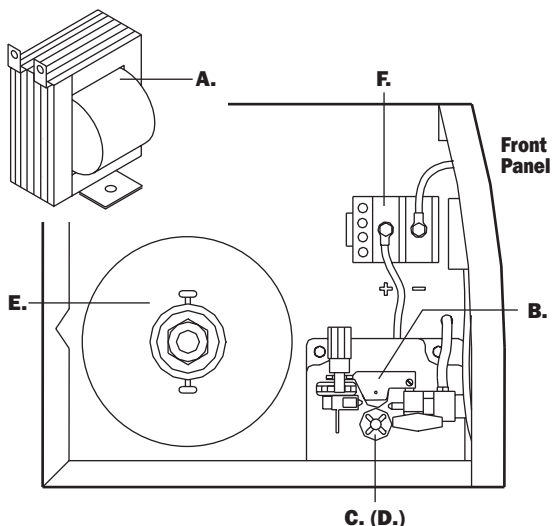
*Thicker material may be welded with multiple passes and proper joint preparation.*





# What Makes A Quality Welder?

When comparing All-In-One MIG welders, look for durable components, a user-friendly design and good safety features. Check out the design features of the Millermatic® family:



**A. Heavy-Duty Transformer.** Built to industrial specifications, the transformer inside a Millermatic withstands years of hard work. We test and rate our machines at 104°F. In hot weather, the Millermatic still welds smoothly long after other welders experience arc flutter.

**B. Cast Aluminum Drive System.** Durable cast aluminum feedhead incorporates spring-loaded tension arm and calibrated tension knob designed to make set up easier and faster.

**C. Drive Rolls.** Dual-groove, quick-change drive rolls provide more flexibility to weld with different wire diameters while providing smooth, positive feeding.

The Millermatic 210, 251 and 300 feature dual gear-driven rolls, driving the wire from top and bottom for a more positive feed (minimizing the chance for arc stumbling due to poor feeding).

**D. Drive Motors.** (Located behind C. Drive Rolls) have gone through extended life testing to ensure years of reliable performance.

**E. Wire Braking.** A good braking system, like that in the Millermatic series, provides the correct wire tension, preventing over-spooling, tangles and sloppy feeding.

**F. Convenient Polarity Reversing.** Millermatic welders feature quick polarity changeover, which makes it easy to switch between hard and flux cored wires. With some competitive units, you have to rewire the machine.

**Contactors.** All Millermetics have either a mechanical or solid-state contactor that keeps the gun electrically cold until you pull the trigger. Some brands don't have this feature.

**Miller's Exclusive "Tip Saver" Short Circuit Protection.** This feature in the Millermatic 135, 175 and 251 shuts down output when tip is shorted to the work. It extends contact tip life and protects internal components from damage. **Trigger reset** permits quick reset at torch rather than unit.

**Fan Cooling.** This protects your investment by keeping a Millermatic's internal components at the designed operating temperature.

**Overload Protection.** Thermal shutdown protects the welder if the airflow is blocked or the fan circuit does not operate.

**Warranty.** Like all Miller welders, we cover the Millermatic with our three-year True Blue® Warranty.



# Product Highlights

## Miller<sup>®</sup>matic 135

For the light-duty or occasional user who wants exceptional performance. The Miller<sup>®</sup>matic 135 provides a smooth low-end arc for welding metals as thin as 24 ga. without burn-through and enough power to provide good penetration on metals up to 3/16 in. thick. It also features Infinite Voltage Control with Wire Feed Speed Tracking which automatically increases or decreases when voltage is adjusted for a broader operating range with finer control.



## Miller<sup>®</sup>matic 175

When the light-duty user needs a little more power, the Miller<sup>®</sup>matic 175 uses 230 V input power to weld materials up to 1/4 in. in a single pass. It also features Infinite Voltage Control with Wire Feed Speed Tracking for automatic adjustment so you can stay in the Sweet Spot even when voltage is changed. At 81 lb. the Miller<sup>®</sup>matic 175 is compact and easily portable, and with a 30 to 175 amp range it provides the extra power you need.



## Miller<sup>®</sup>matic 210

More power, 30 to 210 amp range for larger welding projects, the Miller<sup>®</sup>matic 210 also offers the fine tuning control racing professionals demand. It features seven taps for improved high and low end performance and an industrial, dual-gear driven drive roll system for running large spools of wire. The Miller<sup>®</sup>matic 210 provides a “soft” arc with great wetting action for superior bead appearance. And for aluminum applications, there is a direct hookup for a Spoolmate<sup>™</sup> 3035 spool gun.



## Miller<sup>®</sup> Pulser

The only all-in-one unit specifically designed to pulse MIG thin aluminum, the Miller<sup>®</sup> Pulser is truly innovative. The unit features a 30 to 200 amp range, can weld aluminum as thin as 19 ga. or up to 3/8 in. thick. It comes standard with a Spoolmate™ 3035 spool gun and dual cylinder rack for easy set-up and operation.



## Miller<sup>®</sup> 251

The Miller<sup>®</sup> 251 is an all-in-one MIG welder that provides a superior arc when welding 22 gauge up to 1/2 in. metal. Engineered for performance, the Active Arc Stabilizer™ provides the most consistent arc starts in its class along with optimum weld performance in all settings.



Aluminum welding setup is easy with the direct hookup of the optional Spoolmatic 30A. With Miller's exclusive Gun-On-Demand, simply pull the trigger for either gun and you're ready to weld.

Add the optional Push-Pull Module and an XR gun for professional aluminum wire feed capability. XR-type guns can be directly connected to the Miller<sup>®</sup> 251 with this optional Push-Pull Module. This allows you to use 12 in. rolls of wire instead of the more expensive 1 lb. rolls with the spoolgun.

## Millermatic® 300

Miller's first three-phase all-in-one welder. The Millermatic 300 has the convenience, simplicity and physical size of the Millermatic 251, but uses three-phase input power for a super-smooth arc. Plus, you get 300 amps of weld output at 60% duty cycle and can run 1/16 in. wire. Take on bigger jobs

—you've got the power.



- Unique 4x4 system providing four gear-driven drive rolls for optimum wire feeding performance.
- Easily adapts to aluminum—to add an aluminum spool gun, like the Spoolmatic 30A, just plug it in! No extra module to buy or install.
- Digital meters—so you can preset voltage and wire feed speed to ensure accuracy and reduce practice welds.

For detailed specification sheets or to locate your  
nearest Miller distributor, call:

**1-800-4-A-Miller**  
**(1-800-426-4553)**

**[www.MillerWelds.com](http://www.MillerWelds.com)**



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