







# Automatic M™

## Microprocessor Weld Control

### Processes

-  MIG (GMAW) Welding
-  Pulsed MIG (GMAW-P) Welding
-  Adaptive Pulsed MIG (GMAW-P) Welding
-  Flux Cored (FCAW) Welding



Automatic M; an AMD-4R right-hand drive motor with gas valve, voltage sensing, and quick-change drive rolls; and a set of 10 ft (3 m) cables.

The Automatic M™ microprocessor-based weld control brings superior programmability and process control to fixed automation and to robots lacking weld control capabilities. The Automatic M comes ready to operate, with eight preprogrammed synergic pulse programs.

For versatility across ITW Welding Automation welding platforms, the Automatic M puts the full programmable strength to work for you.

### Applications

- Automotive
- Aircraft
- Recreational equipment
- Farm equipment
- Construction equipment

### Features

Features	Benefits
Single panel	Ability to do MIG, pulsed MIG and adaptive pulsed MIG with no need for an additional panel.
Customized programs	Easily modified to meet your specific application requirements.
Optional data card	Allows copying customized programs to other Miller Automatic M, Robotic Interface II™ or 64M feeders, or it can be used as a security device to protect programs/processes.
Large display	Easy to set up and program via buttons and LCD display. Wire feed speed, trim and voltage can be read from a distance.
Preprogrammed synergic pulse programs	Includes eight preprogrammed synergic pulse programs for fast start-up in typical pulse applications.
Remote program select	Allows changing program from the system or optional remote operator pendant.
Error messages displayed and LED indicators	Facilitate troubleshooting and getting back on-line. LED indicators for gas, wire and weld enable.
E-stop	Prevents welding outside of defined parameters.
Fixture interface	Includes 17 dedicated inputs, 4 dedicated outputs and 2 user-defined outputs for fixture interface or control.
Quick disconnect	Makes it easy to interface a PLC or other control system.
Two arc monitors	Shuts system down if voltage or amperages fall outside user defined values.
Arc time counter	Keeps track of arc time and weld cycles.
Optional remote pendant	For remote program selection and control to weld parameters.

### Interface Console Specifications *(Subject to change without notice.)*

Input Power	Welding Power Source Type	Welding Processes	Wire Feed Speed Range	Wire Diameter Range	Dimensions	Weight
From power source: single-phase, 115 VAC, 5 amps, 50/60 Hz	CV DC with contactor and 14-pin remote control for MIG. CV/CC DC inverter with contactor and 17-pin remote control for MIG, pulsed MIG, and Flux Cored .	MIG, pulsed MIG, and Flux Cored	Standard: 50–780 IPM (1.3–19.8 MPM) [Speeds while using MIG. With pulsed MIG (GMAW-P), speed ranges may be more limited.]	.030–1/16 in (0.8–1.6 mm)	H: 15 in (381 mm) W: 16 in (406 mm) D: 8-1/2 in (216 mm)	Net: 33 lb (15 kg) Ship: 38 lb (17.2 kg)
Power Source Setup	Connections to all Devices	Terminal Strips for RCPT	Diagnostic LEDs	I/O Indicator LEDs	Environmentally Sealed Unit	Mounting Method
Programmable	Bottom	Standard	Standard	Standard (inside unit)	Standard	Wall

### Optional Pendant Specifications *(Subject to change without notice.)*

Program Selection	Control Capacity	Dimensions	Net Weight
8 programs	Single microprocessor weld control	H: 11-3/4 in (298 mm) W: 7-1/4 in (184 mm) D: 4 in (102 mm)	2.5 lb (1.2 kg)

**Ordering Information**  See back page.



**Miller Electric Mfg. Co.**  
An Illinois Tool Works Company  
1635 West Spencer Street  
Appleton, WI 54914 USA

**International Headquarters**  
Phone: 920-735-4505  
USA FAX: 920-735-4134  
Canadian FAX: 920-735-4169  
International FAX: 920-735-4125

**Web Site**  
www.MillerWelds.com

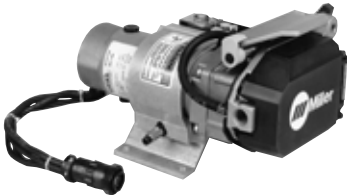


## System Components

- Automatic M console, which includes spool support assembly
- Other accessories required to complete system**
- AMD-4 left-hand or right-hand drive, which includes gas valve, voltage sensing lead and quick-change drive rolls.
- Cables—choice of 10 ft (3 m), 30 ft (9.1 m), or 50 ft (15.2 m) for the following:
  - Motor cable with voltage sensing
  - 14-pin interconnecting cable
  - 17-pin interconnecting cable
  - Voltage-sensing work cable
- Drive roll kit

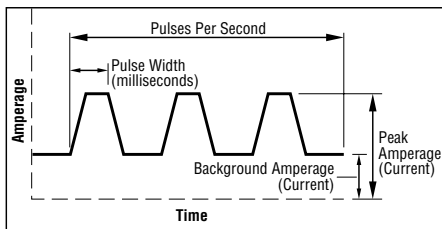


AMD-4G left hand drive



AMD-4R right hand drive

## Pulsed MIG Wave Form



## Capabilities

### Software Features

- Programmable sequences
- Power source range
- System process type
- Arc timer/counter
- Programmable outputs
- Arc monitor – on/off
- Pulse welding
- Arc outage detection – on/off
- Wire stick check
- Programmable error shutdown
- Security lockout
- Arc start hot/standard
- Remote parameter inc./dec. ( $\pm$ )
- Wire feed – std. (high/low future plan)
- Wire type – hard/soft wire
- Software version display
- Soft pulse arc
- Auto retract
- Polarity sensor
- Weld current monitor
- Ground current sensor

### Front Panel Features

- E-stop
- Wire retract/advance
- Purge
- Display select
- Error reset
- Display meter – digital voltage
- Display meter – digital IPM
- Display meter – ammeter
- Weld on/off – dry run
- Manual weld

## Parameter Ranges

Minimum voltage:	0.0–25.0 V
Maximum voltage:	25.0–99.9 V
Minimum amperage:	0–50 amps
Maximum amperage:	50–999 amps
Inductance:	0.0–99%
Purge:	0.0–25.0 sec
Arc time:	0–9,999.99 hours, 0–999,999 cycles
Wire feed display:	IPM/MPM
Jog IPM:	50–400
Arc voltage error monitor:	0.1–9.9 V 0.1–25 sec
Arc amperage error monitor:	Set: 50–999 Range: 0–99 Time: 9.9 sec.

### Pendant Features

- E-stop
- Wire retract/advance
- Purge
- Start button
- Stop button
- Error reset
- Program select
- Weld on/off – dry run
- Manual weld

### Digital Inputs

- Start
- Stop
- Jog forward
- Jog reverse
- Purge
- Program select (3 bits)
- Error reset
- Arc enable
- Increment parameters
- Decrement parameters
- Select parameter – inc./dec. ( $\pm$ )
- Test weld
- Flow switch input (Water or gas flow switch compatible)
- E-stop





### Digital Outputs

- (2) User-defined programmable outputs
- (4) dedicated outputs
- Arc on
- Wire stick
- Error output – all errors
- Arc enabled/dry run

Burnback:	10.0–38.0 V, (not functional in pulse) 0–0.25 sec
Postflow:	0–9.9 sec
Preflow:	0–9.9 sec
Run-in:	10.0–38.0 V, 50–780 IPM, 0–2.5 sec
Weld cycle:	Trim (arc length): 0–99, 50–780 IPM, 0–25 sec (only for momentary start method)
Crater:	Trim: 0–99, 50–780 IPM, 0–2.5 sec

## Drive Roll Kits (Order from Miller Service Parts.)

Select drive roll kits from chart below according to type and wire size being used. Drive roll kits include necessary guides and feature an anti-wear sleeve for the inlet guide.

Wire size	"V" groove for hard wire 	"U" groove for soft wire or soft-shelled cored wires 	"V" knurled for hard-shelled cored wires 	"U" cogged for extremely soft wire or soft-shelled cored wires (i.e., hard facing types) 
.030 in (0.8 mm)	#151 025	—	—	—
.035 in (0.9 mm)	#151 026	#151 036	#151 052	—
.040 in (1.0 mm)	#151 190	—	—	—
.045 in (1.1/1.2 mm)	#151 027	#151 037	#151 053	#151 070
.052 in (1.3/1.4 mm)	#151 028	#151 038	#151 054	#151 071
1/16 in (1.6 mm)	#151 029	#151 039	#151 055	#151 072
.068/.072 in (1.8 mm)	—	—	#151 056	—
5/64 in (2.0 mm)	—	#151 040	#151 057	#151 073
3/32 in (2.4 mm)	—	#151 041	#151 058	#151 074

## Nylon Wire Guides For feeding aluminum wire. (Order from Miller Service Parts.)

Wire size	Inlet guide	Intermediate
.047 in (1.2 mm)*	#151 203	#151 204
1/16 in (1.6 mm)*	#151 205	#151 206
3/32 in (2.4 mm)*	#151 207	#151 208

Note: "U" groove drive rolls are recommended when feeding aluminum wire. \*2-1/2 ft outlet cables recommended.

## Options and Accessories

### Drive Motor Adapter Bracket #178 237

Adapts AMD-4 motors to A1D-4 mounts.

Note: Other brackets require drive motor (#178 237) adapter brackets.

### 37-pin Plug #193 020

For connecting user's interface cord to 37-pin socket receptacle on Automatic M. Strain relief attaches 37-pin plug to customer-supplied cord.

### Data Cards

XMT® 304 #043 390

Blank data card #155 910



### Remote Pendant Control #043 267

Requires remote pendant cable.

## Cables

### Motor Cables with Voltage Sensing

- #178 099 10 ft (3 m)
- #178 100 30 ft (9.1 m)
- #178 101 50 ft (15.2 m)

### 14-pin Interconnecting Cables

- #178 102 10 ft (3 m)
- #178 103 30 ft (9.1 m)
- #178 104 50 ft (15.2 m)

### 17-pin Interconnecting Cables\*

- #178 105 10 ft (3 m)
- #178 106 30 ft (9.1 m)
- #178 107 50 ft (15.2 m)

\* Pulse only.

### Voltage-sensing Work Cables

- #178 238 10 ft (3 m)
- #178 239 30 ft (9.1 m)
- #178 240 50 ft (15.2 m)

### Remote Pendant Cables (optional)

- #178 108 10 ft (3 m)
- #178 109 30 ft (9.1 m)
- #178 110 50 ft (15.2 m)

### Adapter for Pulse #043 551

Required when using an inverter.

## Wire Handling

### Wire Straightener

- #141 580 For .035–.045 in (0.9–1.1 mm) wire
  - #141 581 For 1/16–1/4 in (1.6–6.4 mm) wire
- Reduces cast to wire, increases service life of liner and contact tubes, while preventing wire drift when welding with a long wire stickout.

Note: Two can be stacked for two-direction straightening.

### Inlet Cable

- #080 428 10 ft (3 m)
- One cable end connects to inlet of wire drive assembly, and the other end has an isolated bracket to connect to wire supply.

## Mounting Brackets

### Swivel Mount #071 294 Field

Allows a 360° rotation for quick gun positioning across the weld joint.

### Angle Mounting Bracket

#082 556 For A1 and A1D

Designed to replace the standard ball joint mounting assembly when using the swivel mount. Recommended for tight spaces.

### 90° Angle Mounting Bracket #082 175

For bidirectional adjustments (across and with the weld), install two swivel mounts using the 90° angle mounting bracket.

### Cross Slide #194 695

Provides 6 in (152 mm) travel adjustment. Two units can be stacked as shown to provide vertical and horizontal movement. (The load curve listed later with the weld oscillator is also applicable.) See Lit. Index No. AU/6.0.

### Remote Gun Mount #079 938

Mounts gun to a fixture, cross slide, oscillator, etc., away from wire drive assembly. Provides 15° swivel adjustment for gun positioning. Outlet cable required. See Lit. Index No. AU/5.0.

### Weld Oscillator and Motorized Cross Slides

See Lit. Index No. AU/6.0.

## Recommended Power Sources

Deltaweld®	Lit. Index No. DC/16.2
Dimension™	Lit. Index No. DC/19.2
XMT® 304	Lit. Index No. DC/18.8
XMT® 456	Lit. Index No. DC/18.8
Invision™ 456P	Lit. Index No. DC/20

## Water Coolant Systems

Coolmate™ 3	<b>#043 007</b>	115 VAC
	<b>#043 008</b>	230 VAC
Coolmate™ V3	<b>#043 009</b>	115 VAC
Coolmate™ 4	<b>#042 288</b>	115 VAC
Coolant	<b>#043 810</b>	

## MIG Welding Guns

GA-50	<b>#044 085</b>	Lit. Index No. AU/5.0
GW-60A	<b>#086 819</b>	Lit. Index No. AU/5.0
GA-30A1	<b>#091 970</b>	Lit. Index No. AU/5.0
GA-50CA	<b>#097 656</b>	Lit. Index No. AU/5.0

# System Checklist and Quotation Sheet

Equipment and Options	Stock No.	Description	Qty.	Price
<b>Automatic M</b>	<b>#043 268</b>	Includes wire spool		
Drives	<b>#178 095</b>	AMD-4G left hand drive		
	<b>#178 098</b>	AMD-4R right hand drive		
Motor Cables with Voltage Sensing (1 required)	<b>#178 099</b>	10 ft (3 m)		
	<b>#178 100</b>	30 ft (9.1 m)		
	<b>#178 101</b>	50 ft (15.2 m)		
14-pin Interconnecting Cables (1 required)	<b>#178 102</b>	10 ft (3 m)		
	<b>#178 103</b>	30 ft (9.1 m)		
	<b>#178 104</b>	50 ft (15.2 m)		
17-pin Interconnecting Cables (1 required for pulse only)	<b>#178 105</b>	10 ft (3 m)		
	<b>#178 106</b>	30 ft (9.1 m)		
	<b>#178 107</b>	50 ft (15.2 m)		
Voltage-sensing Work Cables (1 required)	<b>#178 238</b>	10 ft (3 m)		
	<b>#178 239</b>	30 ft (9.1 m)		
	<b>#178 240</b>	50 ft (15.2 m)		
Adapter (pulse only)	<b>#043 551</b>			
Remote Pendant Cables	<b>#178 108</b>	10 ft (3 m)		
	<b>#178 109</b>	30 ft (9.1 m)		
	<b>#178 110</b>	50 ft (15.2 m)		
Drive Roll Kit		See table on page 3		
<b>Accessories</b>				
Drive Motor Adapter Bracket	<b>#178 237</b>			
Data Cards	<b>#043 390</b>	For XMT® 304		
	<b>#155 910</b>	Blank data card		
Remote Pendant Control	<b>#043 267</b>	Requires remote pendant cable		
Wire Straightener	<b>#141 580</b>	For .035–.045 in (0.9–1.1 mm) wire		
	<b>#141 581</b>	For 1/16–1/4 in (1.6–6.4 mm) wire		
Inlet Cable	<b>#080 428</b>	10 ft (3 m)		
Swivel Mount	<b>#071 294</b>			
Angle Mounting Bracket	<b>#082 556</b>			
90° Angle Mounting Bracket	<b>#082 175</b>			
Cross Slide	<b>#194 695</b>			
Remote Gun Mount	<b>#079 938</b>			
Weld Oscillator	<b>#008 644</b>	See Lit. Index No. AU/6.0		
Adapter Plate	<b>#045 623</b>	See Lit. Index No. AU/6.0		
MSC-2 Motorized Cross Slide Control	<b>#098 380</b>	See Lit. Index No. AU/6.0		
<b>Date:</b>				<b>Total Quoted Price:</b>



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