

# Maxstar® 350 and 700

Issued January 2011 • Index No. DC/24.0

TIG/Stick Welding  
Power Source 

## Quick Specs



### Industrial Applications

Precision Metal Fabrication  
Tube Mills  
Pipe and Tube Fabrication  
Tool and Die  
Exotic Material Fabrication  
Pressure Vessel Fabrication

### Processes

TIG (GTAW)  
Pulsed TIG (GTAW-P)  
Stick (SMAW)  
Air Carbon Arc (CAC-A)  
350: 1/4 in maximum  
700: 3/8 in maximum


**Input Power** 208–575 V, 3- or 1-Phase

**Amperage Range** 350: 3–350 A  
700: 5–700 A

**Rated Output** 350: 300 A at 32 V, 60% Duty Cycle  
700: 600 A at 44 V, 60% Duty Cycle

**Weight** 350: 135.5 lb (61 kg)  
700: 198 lb (90 kg)

## The Power of Blue.®

**AUTOLINE**  Allows for any input voltage hookup (208–575 V) with no manual linking, providing convenience in any job setting. Ideal solution for dirty or unreliable power.

**Blue Lightning™** high-frequency arc starter for non-contact arc initiation. Provides more consistent arc starts and greater reliability compared to traditional HF arc starters. Easy to set and increases productivity.

**Lift-Arc™** start provides arc starting without the use of high frequency.

**Meter calibration** allows meters to be calibrated for certification.

**120 V auxiliary power** receptacle for cooling system or small tools.

**Wind Tunnel Technology™** protects internal electrical components from airborne contaminants, extending the product life.

**Fan-On-Demand™** power source cooling system operates only when needed, reducing noise, energy use and the amount of contaminants pulled through the machine.



Maxstar 350

Maxstar 700

**Program memory** features 9 independent program memories that maintain/save your parameters.

### DC TIG Features

**Exceptionally smooth** and precise arc for welding exotic materials.

**High-speed DC TIG pulse controls.** Pulse frequency capable of pulsing 5000 pulses per second. Pulsing adds arc stability, reduces heat input and warpage and can increase travel speeds. Other parameters include peak amperage, peak time and background amperage.

### DC Stick Features

**Tailored arc control (DIG)** allows the arc characteristic to be changed for specific applications and electrodes. Smooth running 7018 or stiffer, more penetrating 6010.

**Hot Start™** adaptive control provides positive arc starts without sticking.

**Auto-postflow** calculates the length of postflow time based on the amperage setting. This eliminates the need to independently set the postflow time for different amperages. This feature preserves your tungsten and prevents porosity.



Power source is warranted for 3 years, parts and labor.  
Original main power rectifier parts are warranted for 5 years.

MADE IN USA  
APPLETON, WI



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

**Equipment Sales US and Canada**  
Phone: 866-931-9730  
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International FAX: 920-735-4125

**Web Site**  
www.MillerWelds.com



# Specifications (Subject to change without notice.)



Model	Input Power	Welding Amperage Range	Max. Open-Circuit Voltage	Rated Output	Amps Input at Rated Load Output, 50/60 Hz								Dimensions	Net Weight	
					208 V	230 V	400 V	460 V	575V	KVA	KW				
Maxstar 350	Three-Phase	3–350 A	75 VDC 10–15 VDC*	250 A at 30 V, 100% Duty Cycle	27	24	14	12	9	9.7	9.3	H: 24-3/4 in (629 mm) W: 13-3/4 in (349 mm) D: 22 in (559 mm) <b>with TIGRunner®</b> H: 45-1/8 in (1146 mm) W: 23-1/8 in (587 mm) D: 43-3/4 in (1111 mm)	135.5 lb (61 kg)  <b>with TIGRunner®</b> 308 lb (140 kg)		
				300 A at 32 V, 60% Duty Cycle	33	30	17	15	12	12	11.5				
				Single-Phase	3–350 A	75 VDC 10–15 VDC*	180 A at 27.2 V, 100% Duty Cycle	32	32	—	14			11	6.4
	Single-Phase	5–700 A	75 VDC 10–15 VDC*	225 A at 29 V, 60% Duty Cycle	41	37	—	19	15	8.6	8.2				
				500 A at 40 V, 100% Duty Cycle	67	60	35	30	24	24	23			H: 34-1/2 in (876 mm) W: 13-3/4 in (349 mm) D: 22 in (559 mm)	198 lb (90 kg)
				600 A at 44 V, 60% Duty Cycle	89	80	46	40	32	32	31				
Single-Phase	5–700 A	75 VDC 10–15 VDC*	360 A at 34 V, 100% Duty Cycle	77	70	—	35	28	16	15					
Maxstar 700	Three-Phase	5–700 A	75 VDC 10–15 VDC*	450 A at 38 V, 60% Duty Cycle	106	96	—	48	38	22	21				

Certified by Canadian Standards Association to both the Canadian and U.S. Standards. All CE models conform to the applicable parts of the IEC 60974 series of standards.

\*Indicates sense-voltage for Lift-Arc TIG and Low OCV Stick.

## Performance Data

### DUTY CYCLE

#### Maxstar 350

##### 3-PHASE

%	AMPERAGE
30%	350 A
60%	300 A
100%	250 A

#### Maxstar 700

##### 3-PHASE

%	AMPERAGE
30%	700 A
60%	600 A
100%	500 A

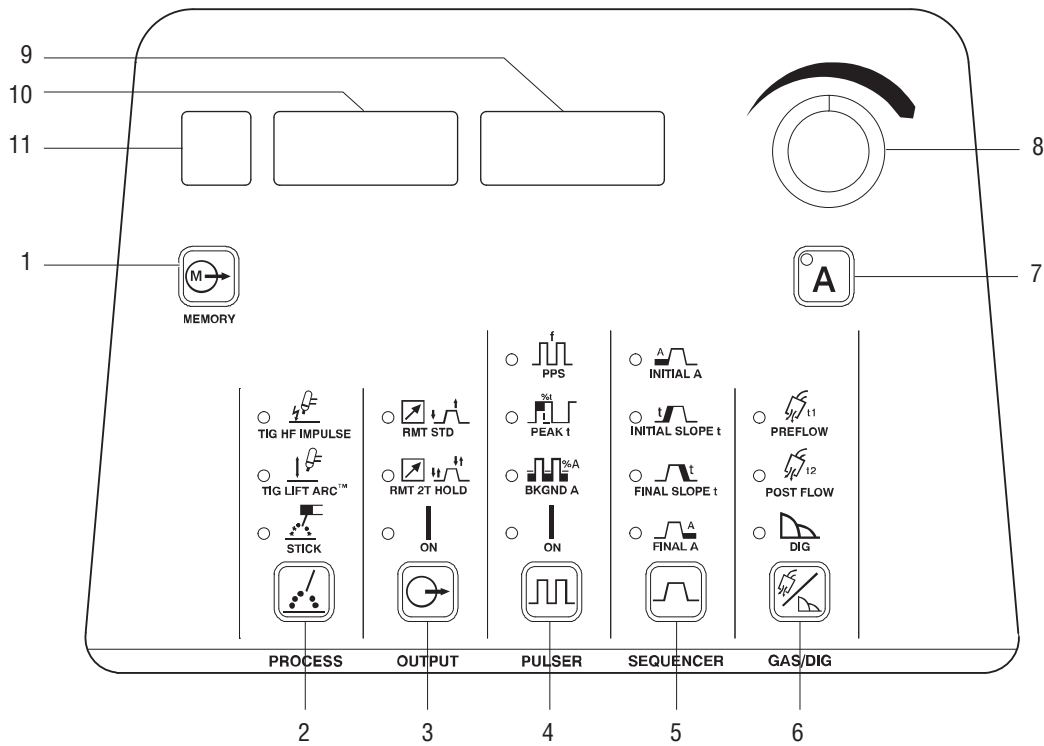
##### 1-PHASE

%	AMPERAGE
10%	350 A
30%	250 A
60%	225 A
100%	180 A

##### 1-PHASE

%	AMPERAGE
10%	700 A
30%	500 A
60%	450 A
100%	360 A

# Maxstar® 350 and 700 Control Panel



## Control Panel Parameter Values

<b>1. Memory</b>	18 Combinations (9 DC TIG) (9 DC Stick)
<b>2. Process/ Arc Starting</b>	TIG: HF Impulse, Lift Arc STICK: Adaptive Hot Start
<b>3. Output Control</b>	Standard Remote, 2T Trigger Hold, Output ON
<b>4. Pulser Control</b>	Pulses per Second DC: 0.1–5000 PPS Peak Time 5–95% Background Amps 5–95%
<b>5. Sequencer Control</b>	Initial Amps Maxstar 350: 3–350 A Maxstar 700: 5–700 A  Initial Slope 0.0–50.0 Seconds Final Slope 0.0–50.0 Seconds Final Amps Maxstar 350: 3–350 A Maxstar 700: 5–700 A

<b>6. Gas/DIG Prewflow</b>	0.0–25.0 Seconds
<b>Postflow</b>	Auto Postflow, Adjust 0.0–50 Seconds
<b>DIG</b>	0–100%
<b>7. Amperage Control</b>	
<b>8. Encoder Control</b>	
<b>9. Ammeter Display</b>	
<b>10. Voltmeter Display</b>	
<b>11. Memory Display</b>	

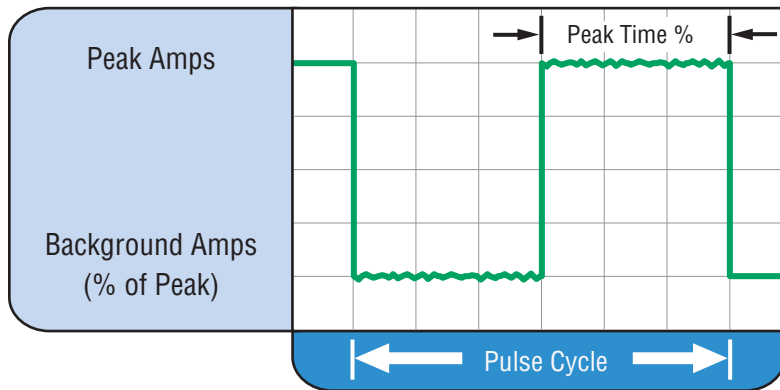
<b>Additional Setup Parameter Values</b>	
<b>Preprogrammed Starts</b>	
Maxstar 350	.020–3/16 in Tungsten
Maxstar 700	.040–1/4 in Tungsten
<b>Programmable Starts</b>	
Amperage	Maxstar 350: 3–200 A Maxstar 700: 5–200 A
Time	1–200 Milliseconds
Ramp Time	0–250 Milliseconds
Minimum Amperage	Maxstar 350: 3–25 A Maxstar 700: 5–25 A
<b>Additional Triggers</b>	3T, 4T, Mini Logic, 4T Momentary
<b>Spot/Weld Timer</b>	0.0–999 Seconds
<b>OCV</b>	Low OCV, Normal OCV
<b>Stick Stuck Check</b>	On/Off
<b>Lockouts</b>	Four levels
<b>Arc Timer</b>	0.0–9999 Hours and 0–59 Min
<b>Cycle Counter</b>	0–999,999 Cycles
<b>Meter Calibration</b>	±0–20.0 Amps ±0–20.0 Volts

# Pulse TIG Controls

## High Speed DC TIG-Pulse Controls

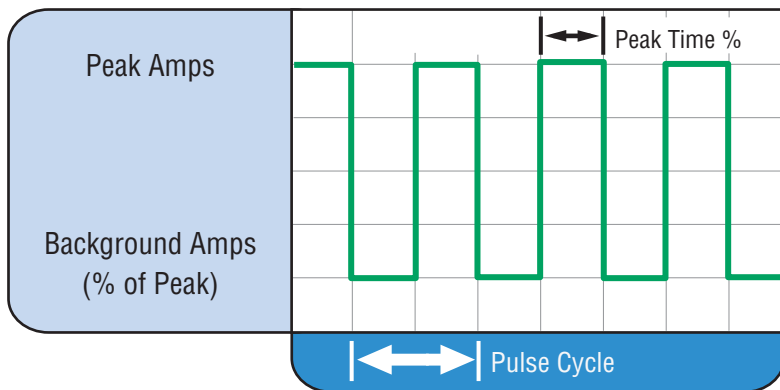
- **PPS Pulses per second (Hz):** DC = 0.1 – 5,000 PPS
- **% ON – % Peak Time:** 5 - 95% (Controls the amount of time during each pulse cycle at the PEAK amperage.)
- **Background Amps:** 5 – 99% (Sets the low-pulse amperage value as a % of the Peak Amps.)

### CONVENTIONAL PULSED TIG



Typically from 1 to 10 PPS. Provides a heating and cooling effect on the weld puddle and can reduce distortion by lowering the average amperage. This heating and cooling effect also produces a distinct ripple pattern in the weld bead. The relationship between pulse frequency and travel speed determines the distance between the ripples. Slow pulsing can also be coordinated with filler metal addition and can increase overall control of the weld puddle.

### HIGH SPEED PULSED TIG



In excess of 40 PPS, Pulsed TIG becomes more audible than visible — causing increased puddle agitation for a better as-welded microstructure. Pulsing the weld current at high speeds — between a high Peak and a low Background amperage — can also constrict and focus the arc. This results in maximum arc stability, increased penetration and increased travel speeds (Common Range: 100 – 500 PPS).

The Arc-Sharpener effects of high speed pulsing are expanded to new dimensions. The ability to pulse at 5,000 PPS further enhances arc stability and concentration potential — which is extremely beneficial to automation where maximum travel speeds are required.



## Maxstar® Power Sources

**Maxstar® 350 #907 334 (CSA)**  
(Auto-Line™ 208–575 VAC)

**Maxstar® 350 #907 334-02-1 (CE)**  
(Auto-Line™ 380–575 VAC)

**Maxstar® 350 with Automation Interface Connection #907 334-00-2 (CSA)**  
(Auto-Line™ 208–575 VAC).  
Includes factory-installed #195 516.

All models include 8 ft (2.4 m) primary cord, (2) Dinse 50 connectors, and DVD Setup Video (#251 116).

*Note: TIG torch adapter must be ordered separately.*

**Maxstar® 700 #907 103 (CSA)**  
(Auto-Line™ 208–575 VAC)

**Maxstar® 700 #907 103-02-1 (CE)**  
(Auto-Line™ 380–575 VAC)

Includes (2) thread lock weld cable connectors (#225 029), (1) water-cooled thread lock torch adapter (#225 028) for #18 or #20 torches, and DVD Setup Video (#251 116).

*Note: Primary cord and TIG torch must be ordered separately.*



## TIGRunner® Package

**Maxstar 350 TIGRunner® #907 334-00-1 (CSA)**

*Completely assembled.*

Package includes:

- Maxstar® 350 (#907 334)
- Coolmate™ 3.5 Coolant System
- Cart with the following features: single cylinder rack, foot pedal holder, (3) cable/torch holders, (2) TIG electrode filler holders and a convenient drawer for tungsten and consumable storage

*Note: Torch package and coolant must be ordered separately.*



## Complete Package

**Maxstar 350 Complete #951 400 (CSA) w/Wireless Foot Control**  
**#951 399 (CSA) w/Foot Control**

*Completely assembled.*

Package includes:

- Maxstar® 350 TIGRunner® (#907 334-00-1)
- Wireless Remote Foot Control (#300 429) or RFCS-14 HD Foot Control (#194 744)
- 25 ft (7.6 m) Weldcraft CS310 torch
- Torch cable cover
- CS310AKC torch accessory kit includes shielding cups, collets, collet bodies and 2% cerium tungsten electrodes (1/16, 3/32, and 1/8 in)
- Smith regulator/flowmeter HM2051A-580
- Gas hose (regulator to machine)
- Water-cooled Dinse torch adapter
- 15 ft (4.6 m) 1/0 weld lead with clamp (work or ground lead) and Dinse connector
- 4 gallons of pre-mixed low-conductivity coolant (#043 810)

## Torch Kits



### 250 A Water-Cooled Torch Kit #300 185

- 25 ft (7.6 m) Weldcraft® WP20 torch
- Torch cable cover
- AK4C torch accessory kit includes shielding cups, collets, collet bodies and 2% cerium tungsten electrodes (1/16, 3/32 and 1/8 in)
- Smith® regulator/flowmeter HM2051A-580
- Gas hose (regulator to machine)
- Water-cooled Dinse torch adapter
- 15 ft (4.6 m) 1/0 weld lead with clamp (work or ground lead) and Dinse connector



### 300 A Water-Cooled Torch Kit #300 183 *Recommended for Maxstar 350*

- 25 ft (7.6 m) Weldcraft® CS310 torch
- Torch cable cover
- CS310AKC torch accessory kit includes shielding cups, collets, collet bodies and 2% cerium tungsten electrodes (1/16, 3/32 and 1/8 in)
- Smith® regulator/flowmeter HM2051A-580
- Gas hose (regulator to machine)
- Water-cooled Dinse torch adapter
- 15 ft (4.6 m) 1/0 weld lead with clamp (work or ground lead) and Dinse connector



### 400 A Water-Cooled Torch Kit #300 186 *Recommended for Maxstar 700*

- 25 ft (7.6 m) Weldcraft® WP18SC torch
- Torch cable cover
- AK18C torch accessory kit includes shielding cups, collets, collet bodies and 2% cerium tungsten electrodes (3/32, 1/8 and 5/32 in)
- Smith® regulator/flowmeter H1954D-580
- Gas hose (regulator to machine)
- Water-cooled thread lock torch adapters
- 12 ft (3.7 m) 4/0 weld lead with clamp (work or ground lead)

### Automation Interface Connection Kit #195 516 Field

Provides control of power source welding parameters through a 28-pin receptacle. The 28-pin receptacle replaces the standard 14-pin receptacle and requires a PLC controller to operate the power source. Ideal for automated equipment integration.

### Weld Current Sensor #300 179 Field

Detects when work clamp is not connected and prevents expensive damage to disconnect devices and input power cord and wiring.

## Educational Materials

To order these items, distributors can call the Miller Literature Distribution Center at 1-920-735-4356, or FAX 1-920-735-4011.

### Gas Tungsten Arc (TIG) Welding Book #170 555

86 pages — 8-1/2 x 11 in. A comprehensive text on all aspects of the GTAW process. Filled with figures and tables to illustrate process technique and equipment setup. Glossary of TIG terms also provided.

### Simulator and Setup CD-ROM #233 558

### DVD Setup Video #251 116

Video topics include Tungsten Selection, Setup Menus, DC Pulse, Sequencer, Balance and Frequency Settings. (Included with machine.)

## Tungsten

Tungsten is 7 in length and available in pkgs of 10. Order from Miller Parts.

### 2% Ceriated (orange) for AC/DC applications

- #WC040X7 .040 in, 10–80 A
- #WC116X7 1/16 in, 70–150 A
- #WC332X7 3/32 in, 140–250 A
- #WC018X7 1/8 in, 225–400 A
- #WC532X7 5/32 in, 300–500 A

### 1.5% Lanthanum (gold) for AC/DC applications

- #WLO40X7 .040 in, 10–80 A
- #WL116X7 1/16 in, 70–150 A
- #WL332X7 3/32 in, 140–250 A
- #WLO18X7 1/8 in, 225–400 A
- #WL532X7 5/32 in, 300–500 A

### 2% Thoriated (red) for DC applications only

- #WTO40X7 .040 in, 10–80 A
- #WT116X7 1/16 in, 70–150 A
- #WT332X7 3/32 in, 140–250 A
- #WTO18X7 1/8 in, 225–400 A
- #WT532X7 5/32 in, 300–500 A

## TIG Welding Gloves

Order from Miller Parts.



### Industrial TIG Welding Gloves #249 199 Large

#249 200 X-Large  
Unlined pigskin leather palm with reinforced palm patch.



### TIG Welding Gloves #249 178 Medium

#249 179 Large  
#249 180 X-Large  
Durable goatskin back and palm with flame-resistant cotton fleece back.



### TIG Welding Gloves (Short Cuff) #249 181 Medium

#249 182 Large  
#249 183 X-Large  
Durable pigskin back and goatskin palm with 3-in cuff.

## Genuine Miller Accessories (continued)



**Runner Cart #300 244**  
Designed to accommodate Dynasty® or Maxstar® 350 or 700 power sources and a Coolmate™ 3.5 Cooler. Cart features single cylinder rack, foot pedal holder,

(3) cable/torch holders, (2) TIG electrode filler holders and a convenient drawer for tungsten and consumable storage.



**Coolmate™ 3.5 #300 245**  
Designed to integrate with the Dynasty® and Maxstar® 350 and 700 power sources. For use with water-cooled torches rated up to 600 amps. 3.5 gallon capacity.



**TIG Coolant #043 810**  
Sold in multiples of 4. Pre-mixed low-conductivity Miller coolant contains ethylene glycol and deionized water to protect from freezing and boiling -37° to 227°F (-38° to 108°C). 1-gallon plastic recyclable bottles.



**Water-Cooled Dinse #195 377**  
For Maxstar® 350. Used to adapt WP20, WP18, and CS310 to dinse-style connector. Order from Miller Parts.



**Water-Cooled Thread Lock #225 028**  
For Dynasty and Maxstar 700. Used with (WP125, WP24W, WP25, WP20, WP18, WP12, CS310, CS410, WP22, WP27) water-cooled torch. Order from Miller Parts.

## Remote Controls and Switches



**Wireless Remote Foot Control #300 429**  
For remote current and contactor control. Receiver plugs

directly into the 14-pin receptacle of Miller machine. 90 ft (27.4 m) operating range.



**RFCS-14 HD Foot Control #194 744**  
Maximum flexibility is accomplished with a recon-

figurable cord that can exit the front, back or either side of the pedal. Foot pedal provides remote current and contactor control. Includes 20 ft (6 m) cord and 14-pin plug.



**RMLS-14 Switch #129 337**  
Momentary- and maintained-contact rocker switch for contactor control. Push forward for maintained contact and backward for momentary contact. Includes 26.5 ft (8 m) cord and 14-pin plug.



**Wireless Remote Hand Control #300 430**

For remote current and contactor control. Receiver plugs directly into the 14-pin receptacle of Miller machine. 300 ft (91.4 m) operating range.



**RHC-14 Hand Control #242 211 020**

Miniature hand control for remote current and contactor control. Dimensions: 4 x 4 x 3-1/4 in (102 x 102 x 83 mm). Includes 20 ft (6 m) cord and 14-pin plug.



**RMS-14 On/Off Control #187 208**

Momentary-contact switch for contactor control. Rubber-covered pushbutton dome switch ideal for repetitive on-off applications. Includes 26.5 ft (8 m) cord and 14-pin plug.



**RCCS-14 Remote Contactor and Current Control #043 688** 14-pin plug North/south rotary-motion fingertip control fastens to TIG torch using two Velcro® straps. Great for applications that require a finer amperage control. Includes 26.5 ft (8 m) control cord.

**Extension Cables for 14-Pin Remote Controls**

#242 208 025 25 ft (7.6 m)  
#242 208 050 50 ft (15.2 m)  
#242 208 080 80 ft (24.4 m)

# Ordering Information

Equipment and Options	Stock No.	Description	Qty.	Price
Maxstar® 350	#907 334	Auto-Line™ 208–575 VAC, 50/60 Hz, <b>CSA</b> . 8 ft primary cord		
Maxstar® 350 International	#907 334-02-1	Auto-Line™ 380–575 VAC, 50/60 Hz, <b>CE</b> . 8 ft primary cord		
Maxstar® 350 with Automation Interface Connection	#907 334-00-2	Auto-Line™ 208–575 VAC, 50/60 Hz, <b>CSA</b> . 8 ft primary cord		
Maxstar® 350 TIGRunner®	#907 334-00-1	Auto-Line™ 208–575 VAC, 50/60 Hz, <b>CSA</b> . 8 ft primary cord. <i>Requires coolant</i>		
Maxstar® 350 Complete with Wireless Remote Foot Control	#951 399	Auto-Line™ 208–575 VAC, 50/60 Hz, <b>CSA</b> . 8 ft primary cord		
Maxstar® 350 Complete with Foot Control	#951 400	Auto-Line™ 208–575 VAC, 50/60 Hz, <b>CSA</b> . 8 ft primary cord		
Maxstar® 700	#907 103	Auto-Line™ 208–575 VAC, 50/60 Hz, <b>CSA</b>		
Maxstar® 700 International	#907 103-02-1	Auto-Line™ 380–575 VAC, 50/60 Hz, <b>CE</b>		
<b>TIG Torch Kits</b>				
Weldcraft® 250 A Water-Cooled Torch Kit	#300 185	See page 6		
Weldcraft® 300 A Water-Cooled Torch Kit	#300 183	See page 6. Recommended for Maxstar 350		
Weldcraft® 400 A Water-Cooled Torch Kit	#300 186	See page 6. Recommended for Maxstar 700		
Weldcraft® 200 A Air-Cooled Torch	#WP2625RM	For Maxstar 350 only. Adapter #195 379 required. <i>Order from Miller Parts</i>		
Consumables and Tungsten		Distributor: See Miller Parts Catalog		
Gas Cylinder, Hose and Fittings				
<b>Remote Controls</b>				
Wireless Remote Foot Control	#300 429	Foot control with wireless 90 ft (27.4 m) operating range		
Wireless Remote Hand Control	#300 430	Hand control with wireless 300 ft (91.4 m) operating range		
RCCS-14	#043 688	North/south fingertip control		
RFCS-14 HD	#194 744	Heavy-duty foot control		
RHC-14	#242 211 020	Hand control		
RMLS-14	#129 337	Momentary/maintained rocker switch		
RMS-14	#187 208	Momentary rubber dome switch		
Extension Cables	#242 208 025 #242 208 050 #242 208 080	25 ft (7.6 m) 50 ft (15.2 m) 80 ft (24.4 m)		
<b>Accessories</b>				
Runner™ Cart	#300 244	See page 7		
Coolmate™ 3.5	#300 245	<i>Requires coolant</i>		
TIG Coolant	#043 810	Sold in multiples of four in 1-gallon plastic bottles		
Automation Interface Kit	#195 516	Field. Provides required automation connections		
Weld Current Sensor	#300 179	Field. Installation required.		
Gas Tungsten Arc (TIG) Welding Book Simulator and Setup CD-ROM	#170 555 #233 558	<i>Order at <a href="http://MillerWelds.com/resources/tools">MillerWelds.com/resources/tools</a></i>		
DVD Setup Video	#251 116	Included with machine		
Torch Adapters		<i>Supplied with power source and torch kits</i>		
Water-Cooled Dinse	#195 377	Used to connect water-cooled torch to Dinse terminal machine. For WP20, WP18 and CS310 (adapter included in Complete Package). <i>Order from Miller Parts</i>		
Water-Cooled Thread Lock	#225 028	Used to connect water-cooled torch to Dynasty/Maxstar 700. <i>Order from Miller Parts</i>		
Cable Connectors		<i>Supplied with power source and torch kits</i>		
Dinse Connector 50 mm (1 male)	#042 418	Used to connect weld lead to Dinse terminal machine		
Thread Lock Connectors (2 male)	#225 029	Used to connect weld lead to Dynasty 700 or Maxstar 700. <i>Order from Miller Parts</i>		
Dinse Connector 50 mm (1 male, 1 female)	#042 419	Used to extend weld cables		
Tweco® Terminal Adapter	#042 465	Male Dinse to female Tweco		
Cam-Lok Terminal Adapter	#042 466	Male Dinse to female Cam-Lok		
<b>Miscellaneous</b>				
Stick Electrodes				
Welding and Work Cables				
Welding Gloves and Helmet				

Date:

Total Quoted Price:

Distributed by:

