

# Syncrowave® 250 DX

Issued February 2003 • Index No. AD/4.2

TIG/Stick Welding  
Power Source 

## Quick Specs



### Industrial Applications

Bicycles  
Aerospace  
Tool Boxes  
Food/Beverage Industry  
Automotive  
Boat Fabrication  
Vocational  
Maintenance and Repair

### Processes

TIG (GTAW)  
Stick (SMAW)  
Pulsed TIG (GTAW-P)  
(Optional)

**Input Power** Requires 1-Phase Power

**Amperage Range** 5–310

**Max. Open-Circuit Voltage** 80

**Rated Output** 200 A at 28 VAC, 60% Duty Cycle  
250 A at 30 VAC, 40% Duty Cycle

**Weight** 389 lb (176 kg)

## The Power of Blue.®

**Squarewave output with AC balance control** features adjustable penetration and cleaning action while increasing arc stability on various aluminum alloys, and helps eliminate tungsten spitting and arc rectification.

**NEW! Built-in cable hangers** on both sides conveniently fold out of power supply to allow all weld cables to be neatly stored to prevent torch or cable damage.

**Last procedure recall** automatically recalls the last procedure set-up when switching polarity. Prevents operator confusion and reduces training time requirements.

**Line voltage compensation** keeps power source constant regardless of fluctuations in input power ( $\pm 10\%$ ).

Standard built-in **preflow** 0.2–5 seconds will purge the weld area prior to welding. Standard built-in **postflow** 0–50 seconds will protect the weld and tungsten when welding is completed.

**Help messages** provide assistance to the operator about output status for machine circuitry.

**Optional built-in pulser** provides a heating and cooling effect on the weld puddle to reduce the heat input and distortion of the material.



Syncrowave 250 DX TIGRunner® with torch shown

**Dual digital meters** allow for quick and easy viewing of actual and preset values of amperage and voltage. Allows for greater accuracy and repeatability in the welding procedure.

**NEW! Built-in consumable storage drawer** located on the front panel allows the operator to store and readily access the needed consumables to be more productive.

**Fan-On-Demand™** reduces maintenance by reducing the amount of airborne contaminants pulled through the machine.

**Lift-Arc™ for DC TIG arc starts** allows TIG starting without the use of high frequency. This feature starts the arc in DC at any amperage without contaminating the weld or the tungsten.

**Adaptive Hot Start™ for Stick arc starts** automatically increases the output amperage at the start of a weld should the start require it. Prevents the electrode from sticking and creating an inclusion.

**Optional built-in sequencer** allows the operator to set a start current that is higher or lower than the welding current. The final slope/final amperage controls provide crater fill and taylor of the weld.

**Selectable starts** allows the operator to choose from three different starting conditions to optimize the application.

**TRUE BLUE**  
3YR. WARRANTY

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

MADE IN **USA**  
APPLETON, WI **USA**



**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



# Specifications (Subject to change without notice.)



Rated Output	Power Factor Correction	60 Hz Amps Input at AC Balance, Rated Load, 1-phase						Welding Amp Range	Max OCV	Dimensions	Weight
		200V	230V	460V	575V	KVA	KW				
200 A, 28 VAC, 60% Duty Cycle, NEMA Class I (40)	Without	88 3.3 *	77 2.8 *	38 1.5 *	31 1.1 *	17.6 .59 *	8.6 .29 *	5-310 A	80 V	H: 36-1/4 in (921 mm) W: 22-1/2 in (572 mm) D: 25 in (635 mm)	389 lb (176 kg)
	With	60 55.3 *	52 49.5 *	26 24.5 *	21 19.6 *	12.06 11.2 *	8.11 .39 *				
250 A, 30 VAC, 40% Duty Cycle, NEMA Class II (40)	Without	110 3.3 *	96 2.8 *	48 1.5 *	38 1.1 *	21.98 .59 *	11.76 .29 *	5-310 A	80 V		
	With	82 55.3 *	71 49.5 *	35 24.5 *	28 19.6 *	16.32 11.2 *	11.81 1.93 *	5-310 A	80 V		

\* While idling.

Rated Output	Power Factor Correction	50 Hz Amps Input at AC Balance, Rated Load, 1-phase						Welding Amp Range	Max OCV	Dimensions	Weight
		200V	230V	460V	575V	KVA	KW				
175 A, 27 VAC, 60% Duty Cycle, NEMA Class I (40)	Without	80 3.3 *	69 2.8 *	35 1.5 *	28 1.1 *	15.9 .59 *	7.4 .29 *	5-310 A	80 V	H: 36-1/4 in (921 mm) W: 22-1/2 in (572 mm) D: 25 in (635 mm)	389 lb (176 kg)
	With	52 55.3 *	45 49.5 *	22 24.5 *	18 19.6 *	10.3 11.2 *	7.3 .39 *				
225 A, 29 VAC, 40% Duty Cycle, NEMA Class II (40)	Without	101 3.3 *	88 2.8 *	44 1.5 *	35 1.1 *	20.2 .59 *	10.2 .29 *	5-310 A	80 V		
	With	74 55.3 *	64 49.5 *	32 24.5 *	26 19.6 *	14.7 11.2 *	10.1 1.93 *	5-310 A	80 V		

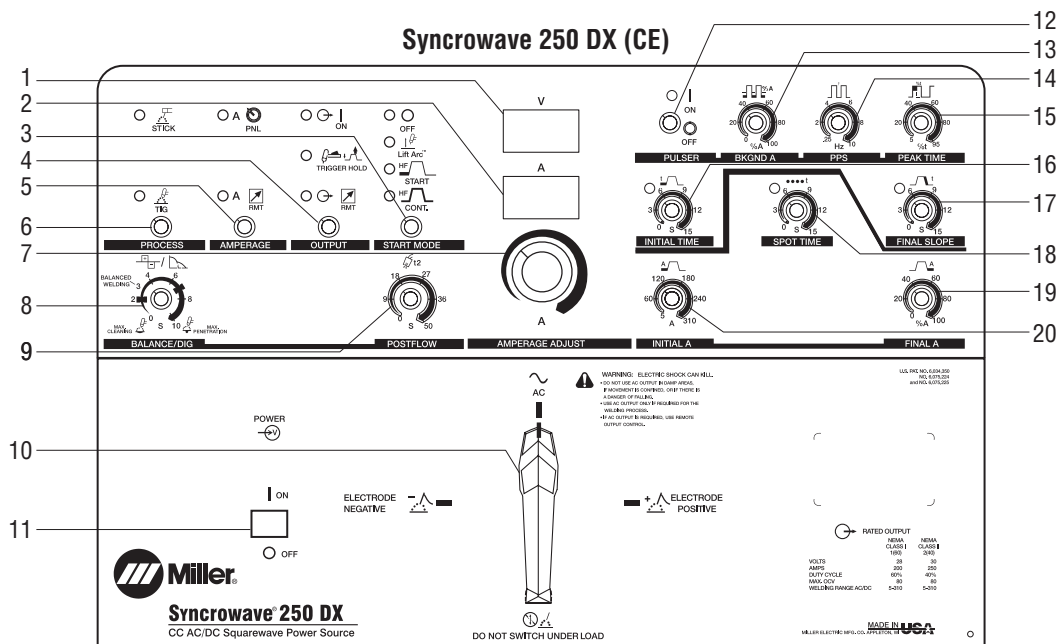
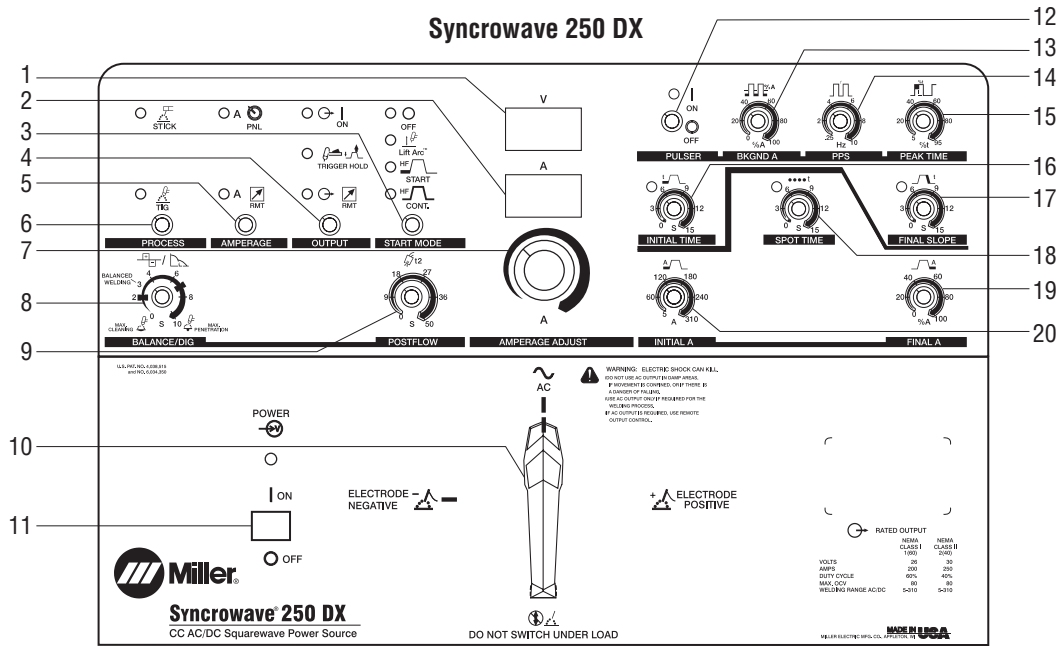
\* While idling.

Rated Output	Power Factor Correction	50/60 Hz Amps Input at AC Balance, Rated Load, 1-phase						Welding Amp Range	Max OCV	Dimensions	Weight
		220V	400V	440V	520V	KVA	KW				
200 A, 28 VAC, 60% Duty Cycle, NEMA Class I (40)	Without	82 3.0 *	45 1.6 *	41 1.4 *	35 1.2 *	17.6 .59 *	8.6 .29 *	5-310 A	80 V	H: 36-1/4 in (921 mm) W: 22-1/2 in (572 mm) D: 25 in (635 mm)	389 lb (176 kg)
	With	61 45.9 *	34 25.1 *	31 22.8 *	26 23.2 *	12.06 11.2 *	8.11 .39 *				
250 A, 30 VAC, 40% Duty Cycle, NEMA Class II (40)	Without	100 3.0 *	55 1.6 *	50 1.4 *	42 1.2 *	21.98 .59 *	11.76 .29 *	5-310 A	80 V		
	With	81 45.9 *	44 25.1 *	40 22.8 *	34 23.2 *	16.32 11.2 *	11.81 1.93 *	5-310 A	80 V		

\* While idling.

Certified by Canadian Standards Association to both Canadian and U.S. Standards. Conforms to European standards.

# Control Panel



- 1. Voltmeter Display
- 2. Ammeter Display
- 3. Start Mode Control
- 4. Output Control
- 5. Amperage Control

- 6. Process Control
- 7. Amperage Adjustment
- 8. Balance/Dig Control
- 9. Postflow Control
- 10. Output Selector Switch

- 11. Power Switch
- 12. Pulse On/Off Control\*
- 13. Background Amps Control\*
- 14. Pulse Frequency Control\*
- 15. Peak Time Control\*

- 16. Initial Time Control\*
- 17. Final Slope Control\*
- 18. Spot Time Control\*
- 19. Final Amperage Control\*
- 20. Initial Amperage Control\*

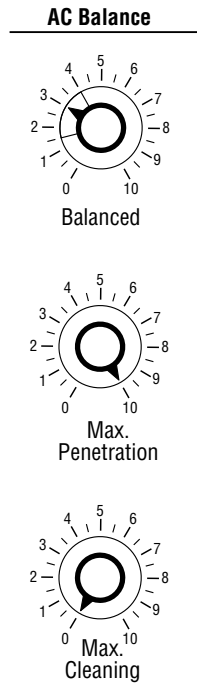
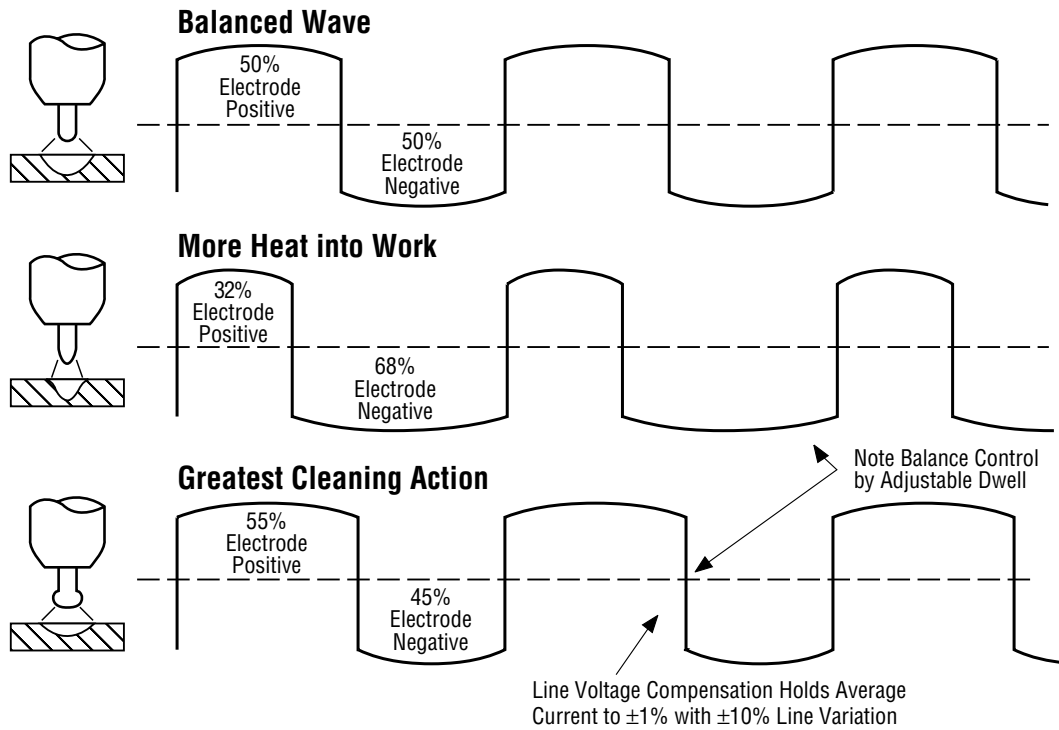
\*Optional

## Control Panel Parameter Values

A. Preflow (s)	0.2–5	E. Background Amperage (%A)	0–100*	I. Initial Amperage (A)	5–310*
B. Balance/Dig	0–10	F. Pulse Frequency (Hz)	.25–10.0*	J. Spot Time (s)	0–15*
C. Postflow (s)	0–50.0	G. Peak Percent Time (%)	5–95*	K. Final Slope Time (s)	0–15*
D. Weld Amperage (A)	5–310	H. Initial Time (s)	0–15*	L. Final Amperage (%A)	0–100*

\*Optional

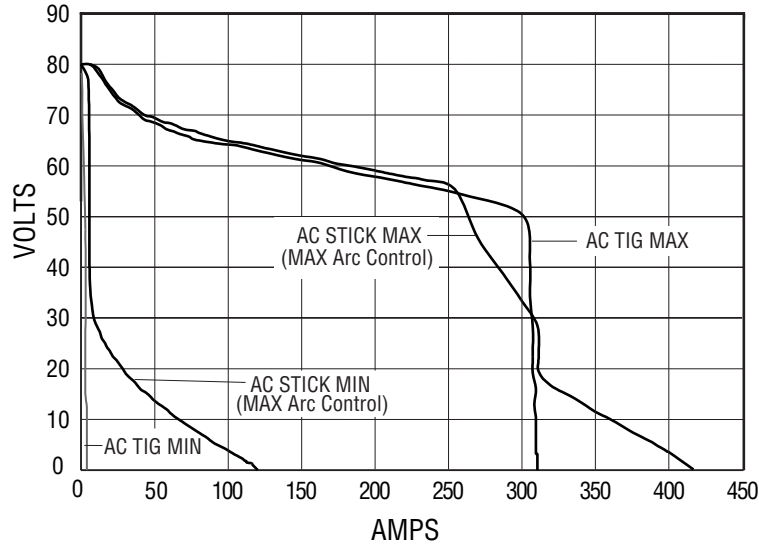
# Balanced Output Control



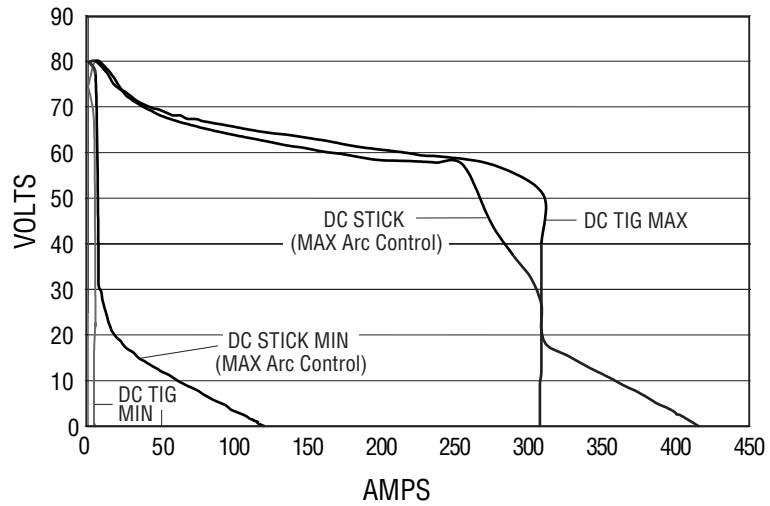
## Balanced Wave Function

# Performance Data

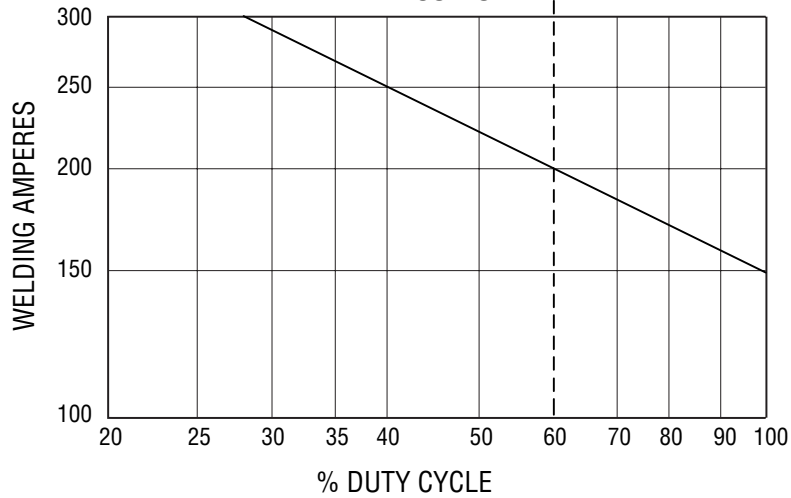
### AC V/A CURVE



### DC V/A CURVE



### RATED OUTPUT



## Genuine Miller Options

### TIGRunner Packages

**Syncrowave 250 DX TIGRunner® #903 765**  
Includes Syncrowave 250 DX (model #903 726), Cool Runner™ 3X, No. 32 Running Gear, and remote foot control (completely assembled). Also includes 45V11 TIG block.

**Syncrowave 250 DX TIGRunner® with Torch #903 765-01-1**  
Includes Syncrowave 250 DX (model #903 726), Cool Runner™ 3X, No. 32 Running Gear, and remote foot control (completely assembled). Also a 25 ft, 250 amp water-cooled DB20M25R Diamondback™ torch, work clamp, 45V11 TIG block, 10 ft gas hose, regulator/flowmeter, cable cover and an AK-4 accessory kit.

**Pulser Module #194 694** Field  
For welding of thin materials. Provides heating and cooling effect of the weld puddle. Provides 0.25 to 10 pulses per second.

**Sequencer Module #043 897**  
Provides a starting current higher or lower than the welding current. Provides final slope and final current for trailing the weld. Provides a spot control for TIG spot application.

**Power Factor Correction Kit #194 692** Field

## Genuine Miller Accessories



**No. 32 Running Gear #194 997**  
Includes two 10 in (254 mm) wheels, two 5 in (127 mm) casters, two-compartment rack (for gas cylinder(s) or Coolmate V3 coolant system), and handles. Provides excellent mobility and easy to install.



**RCCS-14 Remote Contactor and Current Control #043 688** 14-pin plug  
For all Miller solid-state power sources after serial number JK674521. 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.



**RMS-14 On/Off Control #187 208**  
For all Miller solid-state power sources after serial number JK674521. 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.



**RCC-14 Remote Contactor and Current Control #151 086** 14-pin plug  
For all Miller solid-state power sources after serial number JK674521. Side-to-side rotary-motion fingertip control fastens to TIG torch using two Velcro® straps. Great for production or contractors that need quick ramp-up. Includes 26.5 ft (8 m) control cord.



**RHC-14 Hand Control #129 340**  
Miniature hand control for remote current and contactor control. Dimensions: 4 in (102 mm) x 4 in (102 mm) x 3-1/4 in (82 mm). Includes 20 ft (6 m) cord and 14-pin plug.

### Remote Controls and Switches



**RFCS-14 HD Foot Control #194 744**  
For all Miller solid-state power sources after serial number JK674521. This new design increases stability with a larger base, and durability with a heavier cord. Maximum flexibility is accomplished with a reconfigurable 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**  
For all Miller solid-state power sources after serial number JK674521. 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.

**Extension Cords for 14-Pin Remote Controls**  
#122 973 25 ft (7.6 m)  
#122 974 50 ft (15.2 m)  
#122 975 75 ft (23 m)



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

To order this item, distributors can call the Miller Literature Distribution Center at 1-920-751-2120, or FAX 1-920-751-2121. 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.

### Video—GTAW Setup Procedures #108 241

To order this item, distributors can call the Miller Literature Distribution Center at 1-920-751-2120, or FAX 1-920-751-2121. 13:00 minutes. A detailed demonstration on preparing your equipment for TIG welding. Uses a Syncrowave 250 power source, but topics fit any TIG setup including air-or water-cooled systems. In-depth discussion of tungstens and gases.

### TIG Training CD #196 567

Designed for anyone who's looking to better understand the TIG process. Easy to understand instruction, proven teaching steps, and expert advice help to create a more effective academic approach to training. Subject areas covered include system components, process fundamentals, electrical theory, safety, power source operation.

### TIG (GTAW) Torches

#### Diamondback™ TIG Torches

The NEW Diamondback line of ergonomically designed TIG torches from Miller Electric complements the most popular TIG power source line available today. The Diamondback torch line includes both air-cooled and water-cooled models. The air-cooled models range in size from 125 to 200 A. The water-cooled models include 250 and 350 A torches. All models are standard with a rigid head. See Diamondback TIG Torch Selector Guide.



### Water Coolant Systems

For more information, see the Miller Coolant Systems literature sheet, Index No. AY/7.2.

#### Coolmate™ 3

#043 007 115 VAC  
#043 007-01-2 115 VAC, CE  
#043 008 230 VAC  
#043 008-01-2 230 VAC, CE

For use with water-cooled torches rated up to 600 amps. Unique paddle-wheel indicator, external filter and easy-fill spout.

#### Coolmate™ V3

#043 009 115 VAC  
#043 009-01-2 115 VAC, CE

For use with water-cooled torches rated up to 500 amps. Vertical design conveniently mounts to Miller cylinder rack in place of one cylinder.

#### Coolmate™ 4

#042 288 115 VAC  
#042 288-01-5 115 VAC, CE

For use with water-cooled torches rated up to 600 amps. Tough molded polyethylene case with carrying handle.

#### CoolRunner™ 3X

#043 994 115 VAC  
#043 994-01-1 115 VAC, CE

Provides the perfect solution for industrial, water-cooled TIG applications. For water-cooled TIG torches rated up to 500 amps.

#### Low Conductivity Coolant #043 810

Sold in cases of four 1-gallon recyclable plastic bottles. Miller coolants contain a base of ethylene glycol and deionized water to protect against freezing to -37°F (-38°C) or boiling to 227°F (108°C). Also contains a compound that resists algae growth.

# Ordering Information

Equipment and Options	Stock No.	Description	Qty.	Price
<b>Syncrowave® 250 DX</b>	<b>#903 726</b>	200/230/460 V, 50/60 Hz, Standard Model		
	<b>#903 765-01-1</b>	Syncrowave 250 TIGRunner® with torch (includes #903 726 model)		
	<b>#903 765</b>	Syncrowave 250 DX TIGRunner® (includes #903 726 model)		
	<b>#903 757</b>	220/400/440/520 V, 50/60 Hz, English, Standard Model		
	<b>#903 758</b>	230/460/575 V, 50/60 Hz, Standard Model		
	<b>#907 159-01-1</b> <b>#903 759</b>	230/460/575 V, 50/60 Hz, TIGRunner® with Torch 220/400/440/520 V, 50/60 Hz, <b>CE</b> , Standard Model		
Pulser Module	<b>#194 694</b>	Field		
Sequencer Module	<b>#043 897</b>	Field		
Power Factor Correction Kit	<b>#194 692</b>	Field		
<b>TIG Accessories</b>				
No. 32 Running Gear	<b>#194 997</b>			
Diamondback™ TIG Torches		See Diamondback TIG Torch Selector Guide		
Consumables and Tungsten		See Diamondback TIG Torch Selector Guide		
Gas Cylinder				
Gas Hose and Fittings				
<b>Water Coolant Systems</b>				
Coolmate™ 3	<b>#043 007</b>	115 VAC		
	<b>#043 007-01-2</b>	115 VAC, <b>CE</b>		
	<b>#043 008</b>	230 VAC		
	<b>#043 008-01-2</b>	230 VAC, <b>CE</b>		
Coolmate™ V3	<b>#043 009</b>	115 VAC, Upright		
	<b>#043 009-01-2</b>	115 VAC, <b>CE</b> , Upright		
Coolmate™ 4	<b>#042 288</b>	115 VAC		
	<b>#042 288-01-5</b>	115 VAC, <b>CE</b>		
Cool Runner™ 3X	<b>#043 994</b>	115 VAC		
	<b>#043 994-01-1</b>	115 VAC, <b>CE</b>		
Low Conductivity Coolant	<b>#043 810</b>			
Coolant System Hoses				
<b>Stick Accessories</b>				
Stick Hook-Up Kit	<b>#173 851</b>	2/0 cable, 50 ft (15.2 m). Includes electrode holder, weld cable, and work cable with clamp		
Stick Electrodes				
<b>Remote Control</b>				
RFCS-14HD	<b>#194 744</b>	Heavy-duty foot control		
RCCS-14	<b>#043 688</b>	North/south fingertip control		
RCC-14	<b>#151 086</b>	Side-to-side fingertip control		
RMLS-14	<b>#129 337</b>	Momentary/maintained rocker switch		
RMS-14	<b>#187 208</b>	Momentary rubber dome switch		
RHC-14	<b>#129 340</b>	Hand control		
<b>Miscellaneous</b>				
Extension Cords	<b>#122 973</b>	25 ft (7.6 m)		
	<b>#122 974</b>	50 ft (15.2 m)		
	<b>#122 975</b>	75 ft (22.9 m)		
Welding Cables				
Work Cable and Clamp				
Welding Gloves and Helmet				

Date:

Total Quoted Price:

Distributed by:

