

# Syncrowave® 250 DX/350 LX TIG/Stick Welding Power Source

## Quick Specs



### Light Industrial Applications

Precision Metal Fabrication  
Maintenance and Repair  
Light and Heavy Manufacturing  
Aerospace  
Shipbuilding  
Tube and Pipe  
Automotive  
Vocational

### Processes

TIG (GTAW)  
Stick (SMAW)  
Pulsed TIG (GTAW-P)  
(Optional on 250 DX models)  
Air Carbon Arc (CAC-A)  
**250:** 3/16-in. maximum  
**350:** 1/4-in. maximum

### Input Power

1-Phase Power

**Amperage Range** 250: 3–310 350: 3–400

**Max. Open-Circuit Voltage** 80 VDC

**Rated Output** 250: 250 A at 30 VAC, 40% Duty Cycle  
200 A at 28 VAC, 60% Duty Cycle  
350: 350 A at 34 VAC, 40% Duty Cycle  
300 A at 32 VAC, 60% Duty Cycle

### Net Weight

**Standard:** 250: 378 lb. (172 kg) 350: 496 lb. (225 kg)  
**TIGRunner®:** 250: 478 lb. (217 kg) 350: 596 lb. (270 kg)



Standard Machine

See Page 2 for Additional Features

### Syncrowave Complete Package comes complete with:

- Syncrowave® power source
- Coolmate™ 3CS cooler
- No. 37 running gear
- TIG torch kit with accessories
- Remote foot control
- Four gallons of coolant

**AC balance** control provides adjustable oxide removal which is essential for creating the highest quality aluminum welds.

**Syncro Start™** allows the choice of Soft, Medium or Hot TIG starts based on the tungsten size and application.

**Digital welding meters** display both amperage and voltage for viewing of the actual and preset values for greater accuracy and repeatability in your welding procedure.

**High frequency** for non-contact arc initiation that reduces tungsten and material contamination.

**Last procedure recall** simplifies changing your Syncrowave back and forth from aluminum TIG to stainless TIG to Stick welding. One switch makes all the control panel changes.



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



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An ITW Company  
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International Phone: 920-735-4554  
International FAX: 920-735-4125

**MillerWelds.com**  
  



# Additional Features

**Pulse.** Pulsing can increase puddle agitation, arc stability and travel speeds while reducing heat input and distortion (optional on 250 DX model).

**TIGRunner™ system packages with Coolmate™ 3CS cooler.** A three-gallon cooling system equipped with a visual flow indicator ensures that the coolant is flowing. An external coolant filter stops foreign objects from entering the water-cooled torch cable for better flow and longer life. Extended cooling capacity ensures maximum productivity. Three-year cooler warranty.

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

**Tilted operator interface** provides added convenience to your welding experience.

**Arc timer/cycle counter** records actual welding time and number of arc starts. Great for estimating job costs.

**Squarewave technology.** Developed by Miller in 1976 to improve your weld quality and make TIG welding easier. Provides arc stability when welding aluminum, prevents arc rectification and eliminates tungsten erosion.

**Welding aluminum?** Oxides that form on aluminum melt at temperatures over 3700 degrees Fahrenheit. The aluminum material that is located under this layer of oxide melts at 1200 degrees Fahrenheit. The Syncrowave's **AC Squarewave welding current** automatically removes the layer of oxide which is necessary for producing high quality welds.

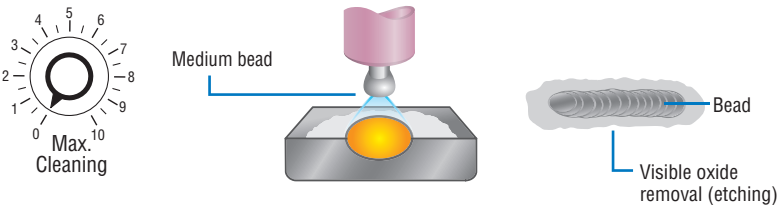
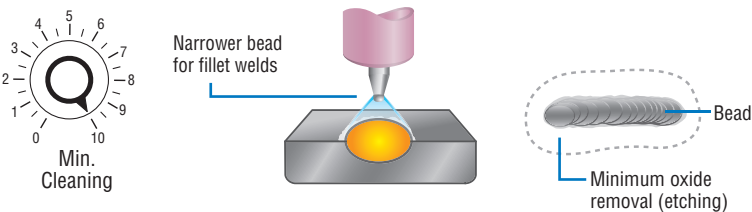
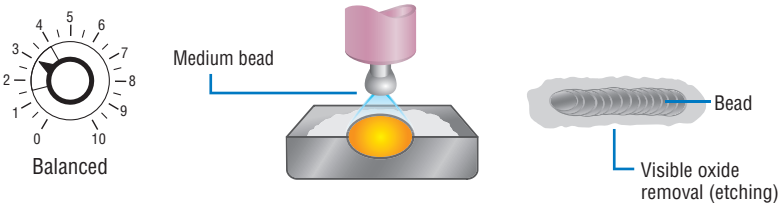
**Do you have power fluctuations?** The Syncrowave compensates for power fluctuation without changing your welding parameters. **Line voltage compensation** works on fluctuating power  $\pm 10$  percent.

**Easy load dual cylinder rack** (see photo at right) minimizes cylinder lifting. Cylinder is not included.

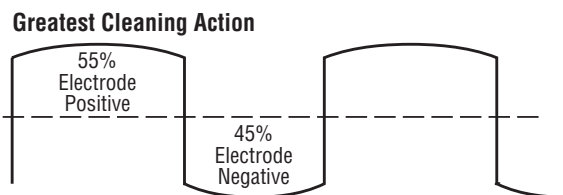
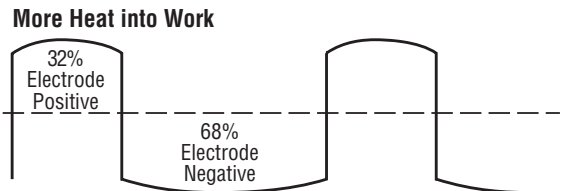
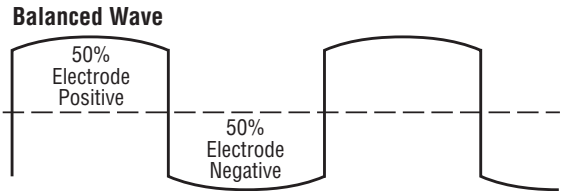


# AC Output: Balance Control

## AC Balance



## Balanced Wave Function



# Specifications (Subject to change without notice.)



Model	Input Power	Welding Amperage Range	Rated Output	Amps Input at AC Balance, Rated Load										Max. OCV	Dimensions	Net Weight
				200V	220V	230V	400V	440V	460V	520V	575V	KVA	KW			
Syncro 250	1-phase, 60 Hz	3-310 A	250 A at 30 V, 40% duty cycle	110	—	96	—	—	48	—	38	22	12	80 V	H: 33.25 in. (845 mm)* W: 22.5 in. (572 mm) D: 25 in. (635 mm)**  with TIGRunner® H: 46 in. (1168 mm)* W: 28.5 in. (724 mm) D: 40.5 in. (1029 mm)**	378 lb. (172 kg)  with TIGRunner® 478 lb. (217 kg)
	1-phase, 50 Hz	3-310 A	225 A at 29 V, 40% duty cycle	101	—	88	—	—	44	—	35	20	10			
Syncro 250 IEC 220/400/ 440/520	1-phase, 50 or 60 Hz	3-310 A	250 A at 30 V, 40% duty cycle	—	100	—	55	50	—	42	—	22	12	80 V	H: 33.25 in. (845 mm)* W: 22.5 in. (572 mm) D: 25 in. (635 mm)**	378 lb. (172 kg)
Syncro 350 All Models	1-phase, 50 or 60 Hz	3-400 A	350 A at 34 V, 40% duty cycle	146	120	128	66	60	65	51	50	30	14	80 V	H: 33.25 in. (845 mm)* W: 22.5 in. (572 mm) D: 25 in. (635 mm)**  with TIGRunner® H: 46 in. (1168 mm)* W: 28.5 in. (724 mm) D: 40.5 in. (1029 mm)**	496 lb. (225 kg)  with TIGRunner® 596 lb. (270 kg)

Notes: See page 6 for Power Factor Correction Kit.

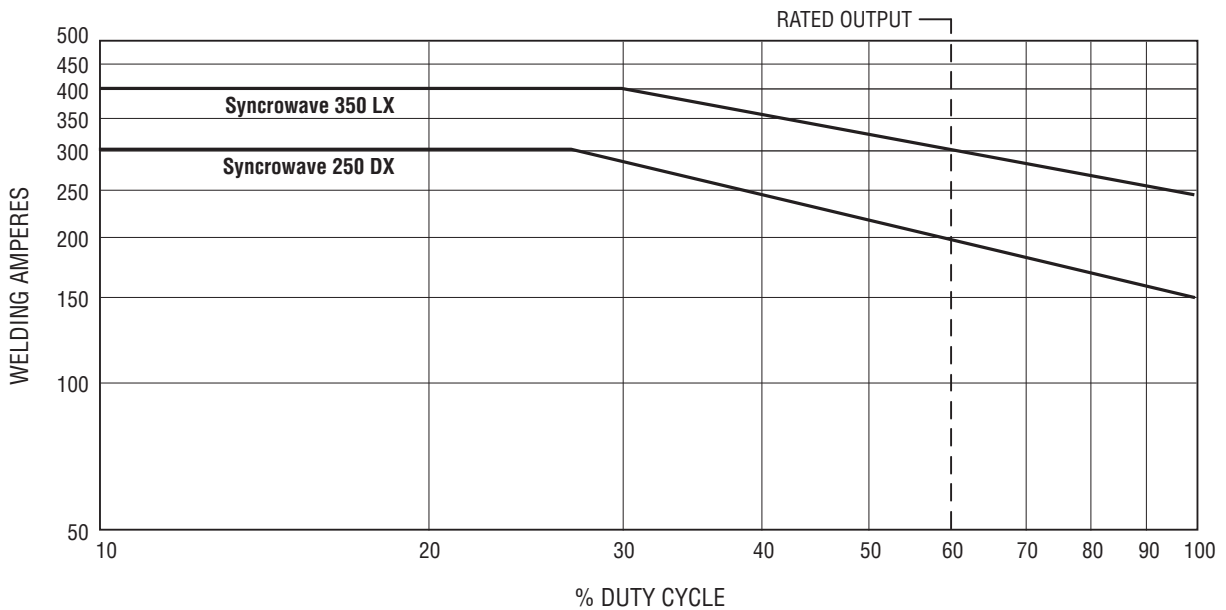
\*Add 3 inches (76 mm) for lift eye. \*\*Add 1.5 inches (38 mm) for handle.

IEC models conform to the following standards: IEC 60974-1: 2005, IEC 60974-10: 2004, and EN 50445

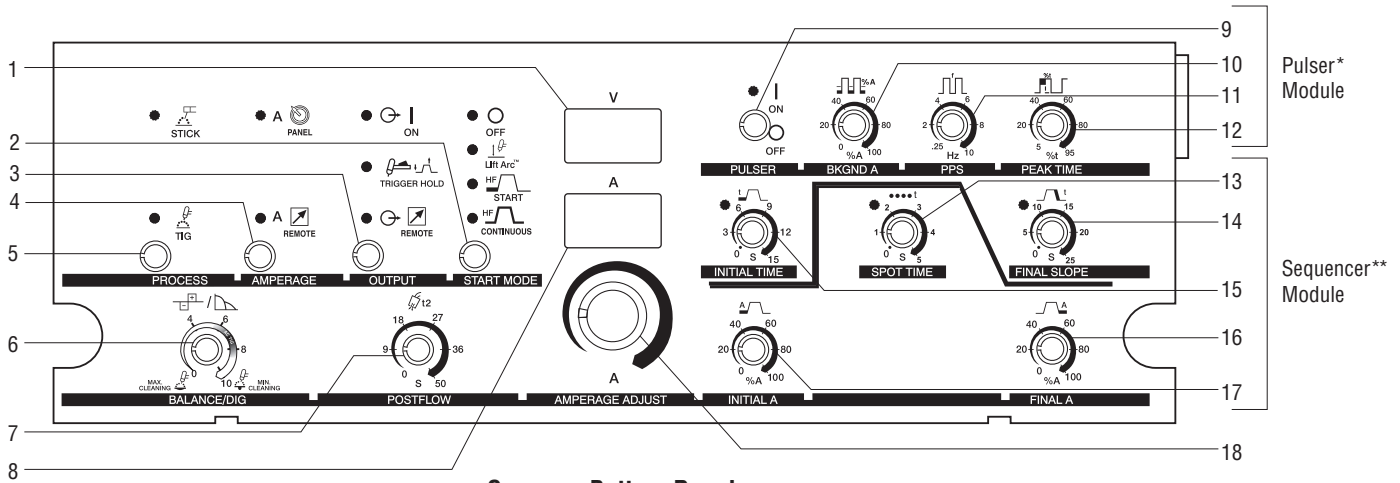
Certified by Canadian Standards Association to both the Canadian and U.S. Standards.

## Performance Data

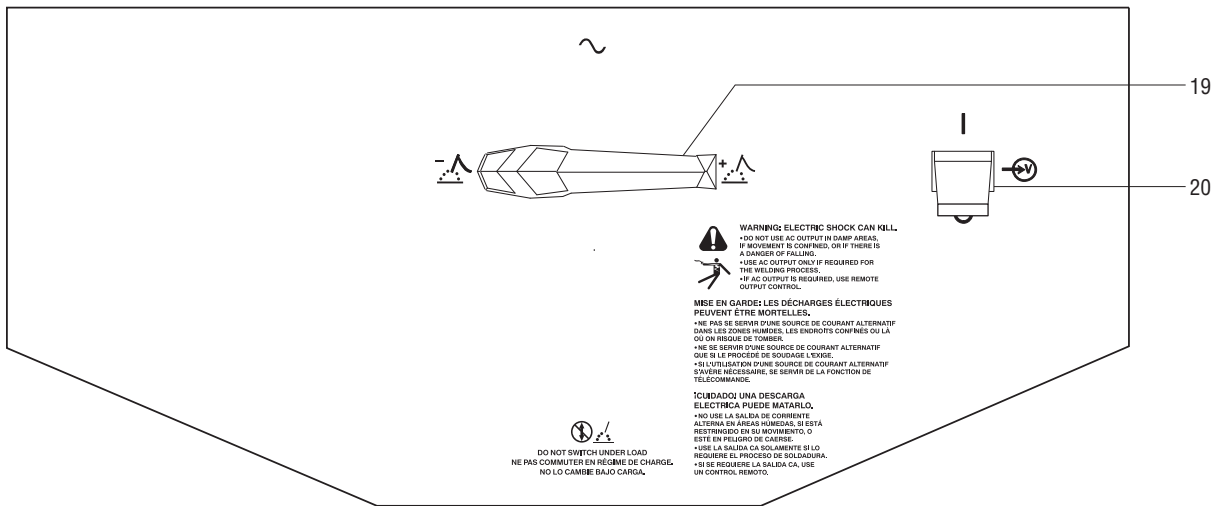
DUTY CYCLE CHART



# Control Panels



Common Bottom Panel



- |   |   |
|---|---|
| 1. Voltmeter Display  | 13. Spot Time Control (0–5 seconds)**         |
| 2. Start Mode Control<br>(Lift-Arc™, HF Start, HF Continuous) | 14. Final Slope Control (0–25 seconds)**      |
| 3. Output Control   | 15. Initial Time Control (0–15 seconds)**     |
| 4. Amperage Control (Panel/Remote)                            | 16. Final Amperage Control (0–100%)**         |
| 5. Process Control (Stick/TIG)                                | 17. Initial Amperage Control (0–100%)**       |
| 6. Balance/Dig Control (0–10)                                 | 18. Amperage Adjustment Control (3–310/400 A) |
| 7. Postflow Time Control (0–50 seconds)                       | 19. Output Selector Switch (AC/DC-/DC+)       |
| 8. Ammeter Display  | 20. Power Switch (On/Off)                     |
| 9. Pulser Control*  |   |
| 10. Background Amps Control (0–100%)*                         |   |
| 11. Pulse-Per-Second Control (0.25–10 Hz)*                    |   |
| 12. Peak Time Control (5–95%)*                                |   |

\*Optional Pulser for 250 DX  
 \*\*Optional Sequencer

# Syncrowave® 250 DX and 350 LX Models/Packages

Standard Model



## Syncrowave Power Sources

### Syncrowave 250 DX

#907 194 (200/230/460 VAC)

#907 195 (230/460/575 VAC)

#907 516 (220/400/440/520 VAC) IEC

### Syncrowave 350 LX

#907 198 (200/230/460 VAC)

#907 199 (230/460/575 VAC)

#907 517 (220/400/440/520 VAC) IEC

*TIG torch connector sold separately. Power cord NOT included.*

Syncrowave TIGRunner



## TIGRunner® Packages

### Syncrowave 250 DX TIGRunner 3CS

#907 194 032 (200/230/460 VAC)

#907 195 032 (230/460/575 VAC)

### Syncrowave 350 LX TIGRunner 3CS

#907 198 032 (200/230/460 VAC)

#907 199 032 (230/460/575 VAC)

Completely assembled. TIGRunner includes Syncrowave power source, Coolmate™ 3CS cooler, No. 37 running gear, and RFCS-14 HD remote foot control.

*TIG torch connector, Dinse-style connector and TIG coolant sold separately. Power cord NOT included.*

Syncrowave Complete  
(Syncrowave TIGRunner,  
TIG Coolant and Torch Kit)

## Complete Packages

### Syncrowave 250 DX Complete

#951 117 (200/230/460 VAC)

#951 118 (230/460/575 VAC)

### Syncrowave 350 LX Complete W-375

#951 622 (200/230/460 VAC)

#951 623 (230/460/575 VAC)

Completely assembled. Includes TIGRunner above (Syncrowave, Coolmate™ 3CS cooler, No. 37 running gear, and RFCS-14 HD remote foot control), plus four gallons of TIG coolant and a water-cooled torch kit (see kits at left) consisting of TIG torch, cable cover, accessory kit, flowmeter regulator, gas hose, torch connector, and work clamp with cable and Dinse-style connector.

*Power cord NOT included.*



W-250 (WP-20) Torch Kit  
for Syncrowave 250 DX TIGRunner



W-375 Torch Kit  
for Syncrowave 350 LX TIGRunner

## Genuine Miller® Options

### Field Options

#### Sequencer Module

**#300 547** Field. For Syncrowave 250/350 Effective with serial number LE282983. Provides a starting current higher or lower than the welding current. Provides final slope and final current for trailing the weld. Provides a spot timer for TIG spot application.

#### Pulser Module

**#300 548** Field. For Syncrowave 250 DX Effective with serial number LE282983. For welding of thin materials. Provides a heating and cooling effect of the weld puddle to reduce heat input and control distortion of the material. Provides 0.25 to 10 pulses per second.

#### Power Factor Correction Kit

**#194 692** Field. For Syncrowave 250 DX  
**#043 757** Field. For Syncrowave 350 LX  
Reduces primary amperage draw by approximately 25 percent allowing the use of smaller breakers/fuses and smaller power cord. Kit does *NOT* reduce the power consumption/electrical bill.

## Genuine Miller® Accessories



#### No. 37 Running Gear #195 282

Includes two 10-inch (254 mm) wheels, two 5-inch (127 mm) casters, two-compartment rack (for gas cylinder(s), and handles. Provides excellent mobility and easy to install.

#### Protective Cover #195 320

Heavy-duty, water- and mildew-resistant. Protects and maintains the finish of the welder.



#### RCCS-14 Remote Contactor and Current Control #043 688

North/south rotary-motion fingertip control attaches to TIG torch using two hook-and-loop fasteners. Great for applications that require a finer amperage control. Includes 26.5-foot (8 m) cord and 14-pin plug.



#### RCC-14 Remote Contactor and Current Control #151 086

East/west rotary-motion fingertip control attaches to TIG torch using two hook-and-loop fasteners. Great for production or contractors that need quick ramp-up. Includes 26.5-foot (8 m) cord and 14-pin plug.



#### RFCS-14 HD Foot Control #194 744

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-foot (6 m) cord and 14-pin plug.



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

Miniature hand control for remote current and contactor control. Dimensions: 4 x 4 x 3.25 inches (102 x 102 x 83 mm). Includes 20-foot (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-foot (8 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-foot (8 m) cord and 14-pin plug.

#### 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)

### 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-foot (27.4 m) operating range.



#### Wireless Remote Hand Control #300 430

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

### Coolant Systems

For more information, see the Miller Coolant Systems literature sheet, Index No. AY7.2.



#### Coolmate™ 3X #300 419

Includes easy-load dual cylinder rack, running gear, handles and 3CS industrial water cooler—a perfect solution for water-cooled TIG torches.



#### Low-Conductivity TIG Coolant #043 810

Sold in multiples of four in one-gallon recyclable plastic bottles. Miller coolants contains a base of ethylene glycol and deionized water to protect against freezing to -37° Fahrenheit (-38° C) or boiling to 227° Fahrenheit (108° C).

## Genuine Miller® Accessories (continued)

### TIG (GTAW) Torch Connectors



#### Water-Cooled TIG Torch Connector #195 377

50-mm Dinse-style with water return line. For use with all Weldcraft™ water-cooled torches.



#### Air-Cooled TIG Torch Connector #195 379

Used to adapt a Weldcraft™ A-200 (WP-26) torch to a Dinse-style connector.

### Educational Materials

To order, please call Miller Literature at 866-931-9732 or visit [MillerWelds.com/resources/tools](http://MillerWelds.com/resources/tools).

#### Gas Tungsten Arc Welding (TIG) Publication #250 833

#### TIG Training DVD #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.

#### Video – GTAW Setup Procedures #108 241

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. 13:00 minutes.

### TIG Welding Gloves



#### Performance TIG Gloves

#263 345 X-Small (Women's)

#263 346 Small (Women's)

#263 347 Medium

#263 348 Large

#263 349 X-Large

Completely unlined, goat grain leather with triple-padded palm.

### Water-Cooled Torch Kits



#### W-250 (WP-20) Torch Kit #300 185

Recommended for Syncrowave 250 DX

- Weldcraft™ W-250 (WP-20) 25-foot (7.6 m) TIG torch with Dinse-style connector
- Torch cable cover
- Work clamp with 15-foot (4.6 m) 1/0 cable and Dinse-style connector
- Flowmeter regulator
- Gas hose (regulator to machine)
- AK4C torch accessory kit includes nozzles, collets, collet bodies and 2% ceriated tungsten electrodes (1/16, 3/32 and 1/8 inch)



#### W-375 Torch Kit #301 268

Recommended for Syncrowave 350 LX

- Weldcraft™ W-375 25-foot (7.6 m) TIG torch with Dinse-style connector
- Torch cable cover
- Work clamp with 15-foot (4.6 m) 1/0 cable and Dinse-style connector
- Flowmeter regulator
- Gas hose (regulator to machine)
- AK4C torch accessory kit includes nozzles, collets, collet bodies and 2% ceriated tungsten electrodes (1/16, 3/32 and 1/8 inch)



#### W-400 (WP-18SC) Torch Kit #300 186

- Weldcraft™ W-400 (WP-18SC) 25-foot (7.6 m) TIG torch with thread lock connector
- Torch cable cover
- Work clamp with 12-foot (3.7 m) 4/0 cable with thread lock connector
- Flowmeter regulator
- Gas hose (regulator to machine)
- AK18C torch accessory kit includes nozzles, collets, collet bodies and 2% ceriated tungsten electrodes (3/32, 1/8 and 5/32 inch)

Note: Requires Water-Cooled TIG Torch Connector #195 377 (sold separately) for Syncrowave 250 DX and 350 LX.

## Tungsten

Tungsten	Amp Range	2% Ceriated (AC/DC)	2% Lanthanated (AC/DC)
1/16 in. (1.6 mm)	70–150 A	WC116X7	WL2116X7
3/32 in. (2.4 mm)	140–250 A	WC332X7	WL2332X7
1/8 in. (3.2 mm)	225–400 A	WC018X7	WL2018X7
5/32 in. (4.0 mm)	300–500 A	WC532X7	WL2532X7

# Ordering Information

Equipment and Options	Stock No.	Description	Qty.	Price
<b>Syncrowave® 250 DX</b>	#907 194	200/230/460 V, 50/60 Hz, Standard Model		
	#907 195	230/460/575 V, 50/60 Hz, Standard Model		
	#907 516	220/400/440/520 V, 50/60 Hz, <b>IEC</b>		
	#907 194 032	200/230/460 V, 50/60 Hz, Syncrowave 250 DX TIGRunner®3X		
	#951 117	200/230/460 V, 50/60 Hz, Syncrowave 250 DX Complete		
	#907 195 032	230/460/575 V, 50/60 Hz, Syncrowave 250 DX TIGRunner®3X		
<b>Syncrowave® 350 LX</b>	#907 198	200/230/460 V, 50/60 Hz, Standard Model		
	#907 199	230/460/575 V, 50/60 Hz, Standard Model		
	#907 517	220/400/440/520 V, 50/60 Hz, <b>IEC</b>		
	#907 198 032	200/230/460 V, 50/60 Hz, Syncrowave 350 LX TIGRunner®3X		
	#951 622	200/230/460 V, 50/60 Hz, Syncrowave 350 LX Complete		
	#907 199 032	230/460/575 V, 50/60 Hz, Syncrowave 350 LX TIGRunner®3X		
<b>Sequencer Module</b>	#300 547	Field. For Syncrowave 250 DX and 350 LX		
	#300 548	Field. For Syncrowave 250 DX		
<b>Pulser Module</b>	#194 692	Field. For Syncrowave 250 DX		
<b>Power Factor Correction Kit</b>	#043 757	Field. For Syncrowave 350 LX		
<b>TIG Torch Kits and Connectors</b>				
<b>Water-Cooled Torch Kits</b>	#300 185	W-250 (WP-20) (recommended for Syncrowave 250 DX)		
	#300 990	W-280 (WP-280)		
	#301 268	W-375 (recommended for Syncrowave 350 LX)		
	#300 186	W-400 (WP-18SC)		
<b>Water-Cooled TIG Torch Connector</b>	#195 377	Connects Weldcraft™ water-cooled torches to Dinse-style connector		
<b>Air-Cooled TIG Torch Connector</b>	#195 379	Connects Weldcraft™ A-200 (WP-26) torch to Dinse-style connector		
<b>Tungsten</b>		See page 7		
<b>Remote Controls</b>				
<b>Wireless Remote Foot Control</b>	#300 429	Foot control with wireless 90-ft. (27.4 m) operating range		
<b>Wireless Remote Hand Control</b>	#300 430	Hand control with wireless 300-ft. (91.4 m) operating range		
<b>RCCS-14</b>	#043 688	North/south fingertip control		
<b>RCC-14</b>	#151 086	East/west fingertip control		
<b>RFCS-14 HD</b>	#194 744	Heavy-duty foot control		
<b>RHC-14</b>	#242 211 020	Hand control		
<b>RMLS-14</b>	#129 337	Momentary/maintained rocker switch		
<b>RMS-14</b>	#187 208	Momentary rubber dome switch		
<b>Extension Cables</b>		See page 6		
<b>Accessories</b>				
<b>No. 37 Running Gear</b>	#195 282			
<b>Protective Cover</b>	#195 320			
<b>Coolmate™ 3X</b>	#300 419	Coolmate 3CS with cart and dual cylinder rack		
<b>TIG Coolant</b> (Must be ordered in quantities of four)	#043 810	1-gallon plastic bottle. Protects against freezing to -37° Fahrenheit (-38° C) or boiling to 227° Fahrenheit (108° C)		
<b>Cable Connectors</b>		<i>Supplied with power source and torch kits</i>		
<b>Dinse-Style Connector 50 mm (1 male)</b>	#042 418	Used to connect weld lead to Dinse terminal machine		
<b>Dinse-Style Connector 50 mm (1 male, 1 female)</b>	#042 419	Used to extend weld cables		
<b>Dinse/Tweco® Adapter</b>	#042 465	Male Dinse to female Tweco		
<b>Dinse/Cam-Lok Adapter</b>	#042 466	Male Dinse to female Cam-Lok		
<b>Gas Tungsten Arc Welding (TIG) Publication</b>	#250 833			
<b>TIG Training DVD</b>	#196 567			
<b>Video – GTAW Setup Procedures</b>	#108 241			
<b>TIG Welding Gloves</b>		See page 7		

Date:

Total Quoted Price:

Distributed by:

