

Submerged Arc Components

Issued Oct. 2004 • Index No. AY/12.0

Submerged
Arc Welding 

Quick Specs

Heavy Industrial Applications

Railcar
Shipbuilding
Heavy Fabrication
Pipe Industry
Pressure Vessel

Processes

Submerged Arc (SAW)
Electroslag (ESW)
GMAW Spray
(with customer-supplied solenoid)

The Power of Blue.®

HDC 1500 DX Controller

Adaptable **AC/DC, CV control** for use in several Sub Arc applications.



Look no further than Miller to find the industry's most advanced Sub Arc welding solutions—featuring the flexible HDC 1500 controllers, and Summit Arc! We offer complete systems that can make you more productive and help lower your weld costs with less power consumption, increased deposition rates, and faster travel speeds!

Summit Arc 1000 and 1250

Three-phase primary power input reduces primary input amperage, input fuse size and input primary cable, with the additional benefit of lower initial hookup costs.

Patented variable balance AC squarewave technology provides six unbalanced variables for optimum performance.

- | | |
|--------------------------|--------------------------|
| 1. 66% EP/34% EN @ 60 Hz | 4. 30% EP/70% EN @ 18 Hz |
| 2. 34% EP/66% EN @ 60 Hz | 5. 60% EP/40% EN @ 18 Hz |
| 3. 70% EP/30% EN @ 18 Hz | 6. 40% EP/60% EN @ 18 Hz |



TRUE BLUE
3YR. WARRANTY

3 years — parts and labor; original main power rectifier parts are warranted for 5 years. Reliability built into each controller.

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



HDC 1500 DX Controller

The HDC 1500 DX is a versatile digital control designed for submerged arc welding. It is compatible with DC or AC power sources and offers CV and Miller's patented CV+C modes. CV+C mode enables operator to pre-set voltage and amperage in lieu of voltage and wire feed speed. This mode also makes adjustments to wire feed while welding to accommodate amperage fluctuations normally associated with changes in electrical stick out or changes in motor speed because of various reasons. This assures consistent amperage like that of constant current and still supplies constant voltage. This means that heat inputs will also remain consistent throughout the weld cycle.



Internal terminal strip is able to integrate with other power sources and peripheral equipment.



Specifications (Subject to change without notice.)

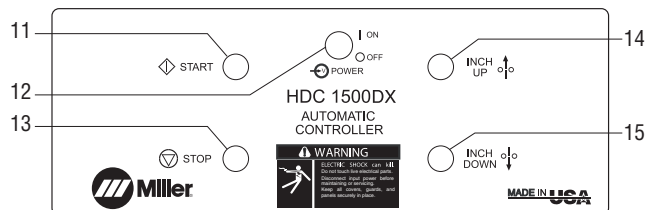
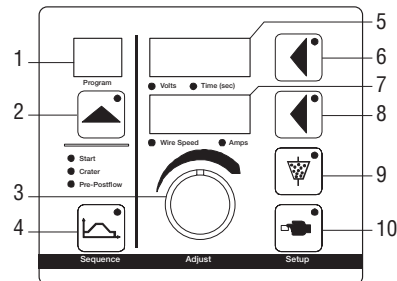


Type of Input from Welding Power Source	Welding Power Source Type	Weld Voltage and Amperage Capacity (AC or DC)	Dimensions	Weight
Single-phase 115 VAC, 3.5 Amps, 50/60 Hz	Constant Voltage (CV), AC or DC, with Remote Contactor and Output Control Capabilities	0–100 V 0–1500 A	H: 7 in (178 mm) W: 11-1/4 in (286 mm) D: 11-1/2 in (292 mm)	18 lb (8.2 kg)

Models with CE specifications are available and manufactured according to the Standards IEC-974-1 and EN-60974-1.

Control Panel

- | | |
|------------------------------|-----------------------|
| 1. Program Display | 9. Flux Push Button |
| 2. Program Push Button | 10. Setup Push Button |
| 3. Adjust Control | 11. Start Button |
| 4. Sequence Push Button | 12. Power Switch |
| 5. Upper Display | 13. Stop Button |
| 6. Upper Display Push Button | 14. Wire Inch Up |
| 7. Lower Display | 15. Wire Inch Down |
| 8. Lower Display Push Button | |



Summit Arc 1000™ /1250 Power Sources (See Literature Index No. AD/7.0 for additional information.)

AC squarewave provides excellent arc starting and positive arc re-ignition throughout the weld cycle for superior arc performance and quality.

Phase-shifting capability and optional variable balance plugs refine arc for specific needs.



Terminal strip provides flexibility for hooking up a remote contactor, voltage and current control, and also running non-Miller products.

Fan-On-Demand™ cooling system only works when needed reducing energy usage and noise.

Specifications (Subject to change without notice.)



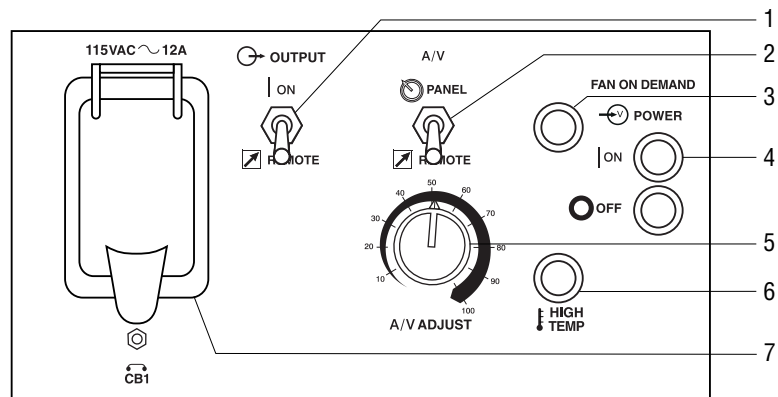
AC or DC Rated Output (Based on a 10 minute duty cycle)	Amperage/Voltage Range	Max. Open-Circuit Voltage	RMS Amps Input at Rated Load Output, 3-Phase at NEMA Load Voltages and Class I Rating					Dimensions	Weight
			400V (50/60 Hz)	460V (60 Hz)	575V (60 Hz)	KVA	KW		
1000 A at 44 V, 100% Duty Cycle; 1250 A at 44 V, 60% Duty Cycle	250–1250 A in CC mode 25–44 V in CV mode	71 V	140 3*	124 3*	100 3*	98 2.37*	53 0.95*	H: 44 in (1118 mm) W: 27-1/4 in (692 mm) D: 46 in (1168 mm)	1225 lb (540 kg)

*While idling.

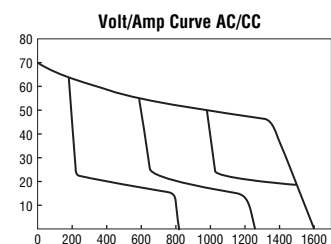
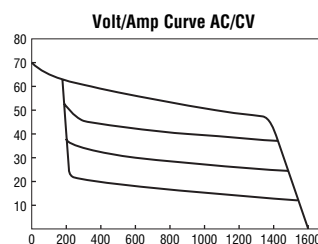
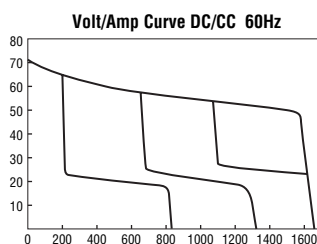
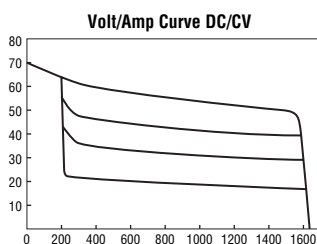
Control Panel

1. Output Control Switch
2. A/V (Amperage/Voltage) Control Switch
3. Power On Indicator Light
4. Power Pushbutton Switch
5. A/V (Amperage/Voltage) Adjustable Control
6. High Temperature Shutdown Indicator Light
7. Duplex Receptacle
(115 VAC, 12 A on 460 and 575 V models;
230 VAC, 16 A on 400 V models)

Note: CC/CV Switch is mounted inside access area.



Performance Data



Dimension™ 652/812 and 1000/1250 Power Sources (See Lit. Index No. DC/19.2 for additional information.)

The powerful Dimensions provide outstanding versatility, plus the endurance and high amperage output to handle the biggest heavy industrial applications.

DC multiprocess capability, versatility and outstanding performance in CV and CV processes.

Line voltage compensation keeps welding parameters constant even when input voltages change $\pm 10\%$. Eliminates need to change welding parameters throughout the day.

Fan-On-Demand™ cooling system only works when needed reducing energy usage and noise.



15 amp 115 VAC duplex receptacle allows operators the flexibility to run grinders, drills, coolers, etc. from the power source without the need for additional 115 VAC power in the weld area.

Power efficient for exceptional value and return on your investment.

Digital meters for presetting and monitoring welding voltage or amperage for more precise control.

Remote control capability allows operators fine tuning capability at an extended distance.

Specifications (Subject to change without notice.)



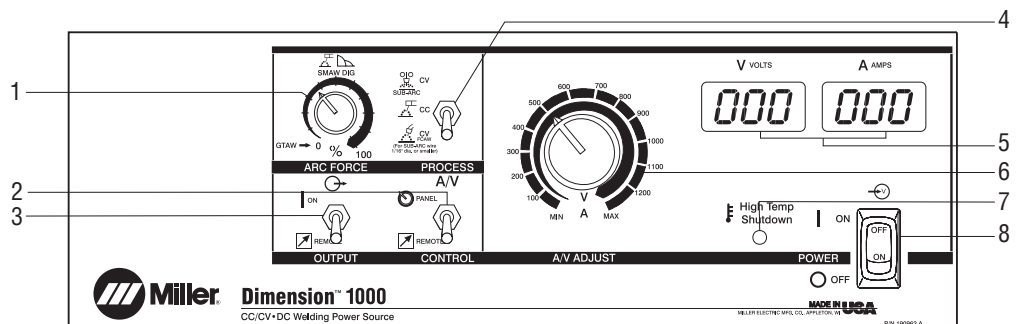
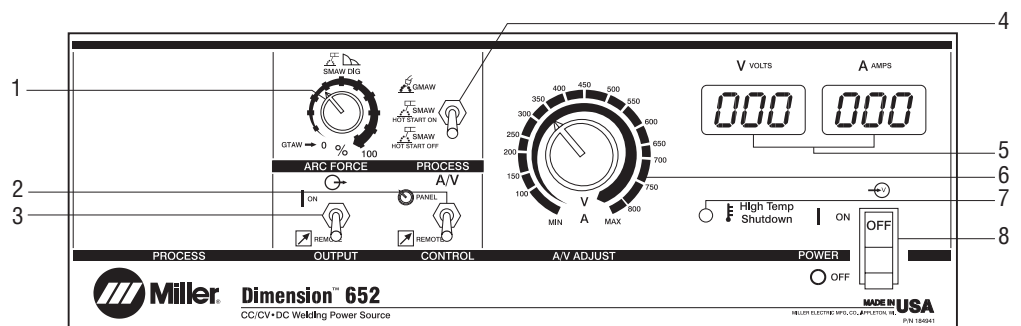
Model	Rated Output	Mode	Amperage/Voltage Range	Max. Open-Circuit Voltage	Amps Input at Rated Load Output, 3-Phase, 50/60 Hz								Dimensions	Weight
					230 V	380 V	400 V	440 V	460 V	575 V	KVA	KW		
Dimension 1000/1250	1000 A at 44 VDC, 100% Duty Cycle; 1250 A at 44 VDC, 60% Duty Cycle	CC	100–1250 A	66 VDC	180	109	104	94	90	72	73	53	H: 27-1/4 in (692 mm) W: 22-1/4 in (565 mm) D: 36 in (914 mm)	644 lb (292 kg)
		CV	10–65 V	38 VDC										
Dimension 652/812	650 A at 44 VDC, 100% Duty Cycle	CC	50–815 A	72 VDC	126	77	73	66	63	50.4	50	34.8		545 lb (247 kg)
		CV	10–65 V	70 VDC										

(Without CE) certified to both the Canadian and U.S. Standards for welding equipment.

50/60 Hz models with CE Specifications are manufactured according to the Standards IEC-974-1 and EN-60974-1.

Control Panels

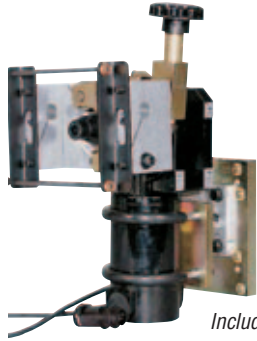
- Arc Force (DIG) Control
- Remote Amperage/Voltage Control Switch
- Output Switch (Contactor)
- Process Switch
- Digital Meters
- Amperage/Voltage Adjustment Control
- High Temperature Shutdown Indicator Light
- Power Switch with Indicator Light



Components and Accessories

RAD Wire Drive Assemblies

Miller offers either standard- or high-speed 115-volt heavy-duty wire drive assemblies. The RAD-400 has a wire feed speed range of 0–400 inches per minute (0–10 MPM). The RAD-780 has a wire feed speed range of 0–780 inches per minute (0–19.8 MPM). Included adapter plate allows mounting to 2-1/2", 4-1/4", and 4-5/8" bolt-hole patterns.



RAD-400
#195 265*
Standard-speed, right-angle wire drive assembly.

RAD-780
#195 266*
High-speed, right-angle wire drive assembly.

Included adapter plate allows mounting to 2-1/2", 4-1/4", and 4-5/8" bolt hole patterns.

Drive Rolls

"V" Knurled drive rolls for use with hard-shelled cored wires.

- 1/16 in (1.5 mm) #132 955
- 5/64 in (2.0 mm) #132 960
- 3/32 in (2.4 mm) #132 961
- 7/64 in (2.8 mm) #132 962
- 1/8 in (3.2 mm) #132 963
- 5/32 in (3.9 mm) #193 700
- 3/16 in (4.7 mm) #193 701
- 7/32 in (5.5 mm) #193 702



Flux Handling Equipment



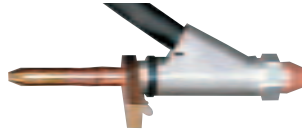
Flux Hopper with Valve
#194 775
Flux hopper with patented automatic flux valve will carry 25 lb of flux. The opening is sized to allow hook-up of any flux-hopper-mounted recovery system. A slag screen is also provided.

Inline Mechanical Flux Valve #043 997
Manually operated flux valve designed to fit within flux tube. This gives you the flexibility to position the valve anywhere between the flux hopper and the torch.

Flux Recovery Systems

- Weld Engineering 1-508-839-9875
- American Vacuum 1-800-321-2849
- Invincible 1-800-282-6999

Submerged Arc Torches



OBT 600 #043 923
600 amp, 100 percent duty cycle torch with concentric flux flow nozzle. Can be used with 1/16–7/32 in (1.6–5.5 mm) wire.

OBT 600 Torch Body Extensions

- 1 inch #043 967
- 2 inch #043 969
- 4 inch #043 973
- 6 inch #043 975



OBT 1200 #043 900
1200 amp, 100 percent duty cycle torch with concentric flux flow nozzle. Can be used with 1/16–7/32 in (1.6–5.5 mm) wire. OBT 1200 features a replaceable breakaway adapter end to prevent costly damage should torch run into an obstruction.

OBT 1200 Torch Body Extension #043 981

Overall length with extension is 9 in. Actual length of extension is 8-1/2 in.

Torch Contact Tips

Wire Size	OBT 600	OBT 1200
1/16 in (1.6 mm)	#192 700	#192 141
5/64 in (2.0 mm)	#192 701	#199 026
3/32 in (2.4 mm)	#192 702	#192 142
7/64 in (2.8 mm)	#192 703	#200 771
1/8 in (3.2 mm)	#192 704	#192 143
5/32 in (4.0 mm)	#192 705	#192 144
3/16 in (4.8 mm)	#192 706	#192 136
7/32 in (5.6 mm)	#192 707	#200 756

Accessories

Wire Straightener #199 733
For RAD-400 (standard-speed) or RAD-780 (high-speed) wire drive assembly. For wires 1/16–7/32 in (1.6–5.6 mm)

Burden Resistor Relay Kit
#198 215 (For Dimension)
#195 393 (For Summit Arc)
Option needed for touch sense start.

Parallel Kit #194 711
Allows easy connection of two Miller power sources for increased amperage applications.

Swivel Mount #071 294*
The wire drive assembly attaches to the swivel mount allowing a 360° rotation for quick torch positioning across the weld joint. Can be mounted directly to 90° angle mounting brackets or cross slides.

90° Angle Mounting Bracket #082 175*
When a bi-directional adjustment (across and with the weld) is desired, two swivel mounts can be installed using the 90° angle mounting bracket.

Cross Slide #195 411*
Allows 6 inches of travel adjustment. Two units can be stacked to provide vertical and horizontal movement.

Heavy-Duty Cross Slide #194 783
One-inch diameter, precision, hardened and ground guide rods provide a perfect path for the sealed linear bushings, and smooth accurate movement of the weld head. Allows for 6" of travel adjustment and has a load capacity of 200 lb. Recommended for tandem.



Wire Reel
#108 008
For 60 lb (27 kg) coil of wire. Requires Spool Support Assembly (#119 438).

Spool Support Assembly #119 438
For 60 lb (27 kg) wire reel.

Cable Kit for HDC 1500 Controllers
#195 308
Includes 30 ft (9 m) 14-pin interconnect cable and 10 ft (3 m) motor cable.

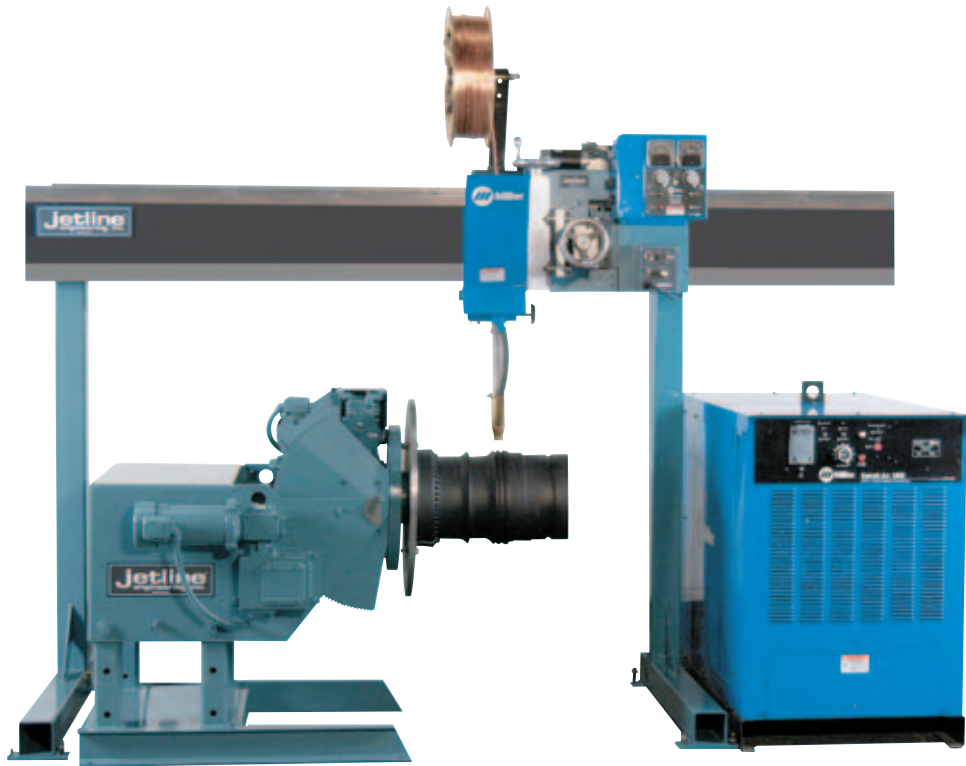
Motor Extension Cable #195 342
25 ft (7.6 m) extension for the motor cable supplied in kit #195 308.

Extension Cables
25 ft (7.6 m) #043 725
50 ft (15 m) #043 726
75 ft (23 m) #043 727
14-pin welding power source control cable. Extends distance between power source and controller.

Shunt Control
#195 052 For HDC 1500A or HDC 1500DX
For power sources without 14-pin current feedback.

*Swivel mount, wire drive assemblies, 90° angle mounting bracket and cross slide have 4-1/4" x 4-1/4" bolt-hole pattern. **Not recommended for tandem.**

Typical Submerged Arc



Note: Sub Arc packages do not include all equipment shown. Miller accessories are listed on back page. Miller equipment will interface with all manufacturers.

Sidebeam travel carriage and table available from third party manufacturers.

*For information, contact
Jetline 949-951-1515
Panjiris 314-776-6893*

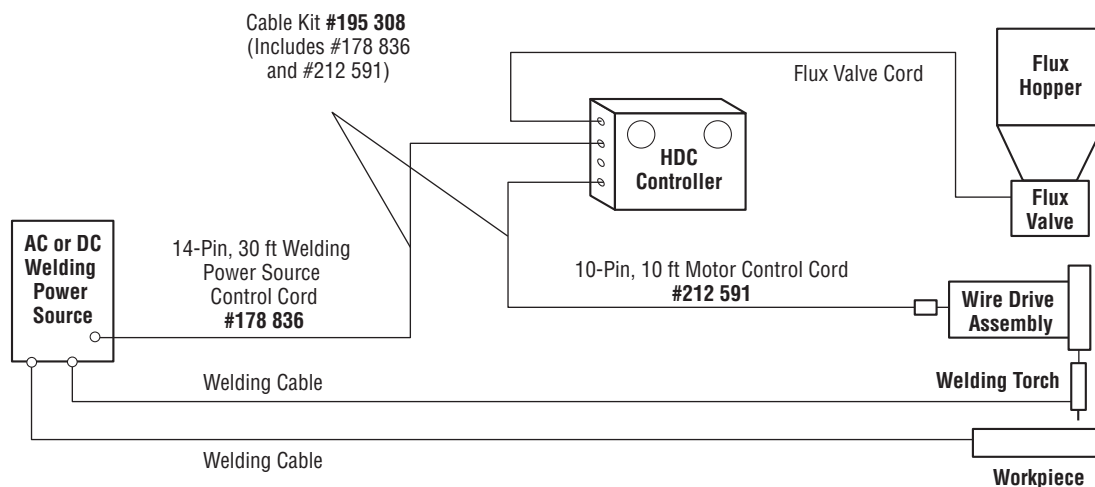
Typical Package Includes:

- Power Source (DC or AC/DC)
- Control (analog or digital)
- Cable Kit
- Motor Drive
- Torch
- Wire Straightener
- Flux Hopper

See back page for ordering information and additional accessories.

Note: A shunt control is needed for non-Miller power sources and older Miller power sources.

Typical Installation



Recommended Power Sources

Summit Arc 1000™	#903 530 460 V #903 599 575 V
Summit Arc 1250	#903 570 400 V, 50/60 Hz
Deltaweld® Series	See Lit. Index No. DC/16.2
Deltaweld 652	#903 396 230/460/575 V, 60 Hz
Deltaweld 852	#903 397 380/400/440 V, 50/60 Hz #903 397-01-3 380/400/440 V, 50/60 Hz w/CE

Dimension™ Series	See Lit. Index No. DC/19.2
Dimension 652	#903 379 230/460/575 V, 60 Hz
Dimension 812	#903 259 380/400/440 V, 50/60 Hz #903 482 380/520 V, 50/60 Hz #903 259-01-4 380/400/440 V, 50/60 Hz w/CE
Dimension 1000	#903 650 230/460/575 V, 60 Hz
Dimension 1250	#903 691 380/400/440 V, 50/60 Hz #903 691-01-1 380/400/440 V, 50/60 Hz w/CE

Ordering Information

Equipment and Options	Stock No.	Description	Qty.	Price
HDC 1500 A	#195 302 #195 302-01-1	With CE		
HDC 1500 DX	#195 215 #195 215-01-1	With CE		
RAD Drive Motors				
RAD-400	#195 265	Standard-speed right-angle drive motor		
RAD-780	#195 266	High-speed right-angle drive motor		
Drive Rolls		See chart on page 6		
Flux Handling Equipment				
Flux Hopper with Valve	#194 775	25 lb capacity		
Inline Mechanical Flux Valve	#043 997	Manually operated		
Flux Recovery Systems		See page 6		
Torches				
OBT 600	#043 923	600 amp, 100% duty cycle, air-cooled		
OBT 600 Torch Body Extensions	#043 967 #043 969 #043 973 #043 975	1 inch 2 inch 4 inch 6 inch		
OBT 1200	#043 900	1200 amp, 100% duty cycle, air-cooled		
OBT 1200 Torch Body Extension	#043 981	9 inch		
Contact Tips		See chart on page 6		
Accessories				
Wire Straightener	#199 733	For 1/16–7/32 in (1.6–5.6 mm) wire		
Burden Resistor Relay Kit	#198 215 #195 393	Required for touch-sense operation with Dimensions and Deltawelds Required for touch-sense operation with Summit Arc		
Parallel Kit	#194 711			
Swivel Mount	#071 294	Provides 360° rotation		
90° Angle Mounting Bracket	#082 175	Allow bi-directional movement		
Cross Slide	#195 411	Provides 6-in travel adjustment, load capacity of 150 lb		
Heavy-Duty Cross Slide	#194 783	Provides 6-in travel adjustment, load capacity of 200 lb		
Wire Reel	#108 008	For 60 lb (27 kg) coil, requires Spool Support Assembly #119 438		
Spool Support Assembly	#119 438	Support for 60 lb reels		
Cable Kit for HDC 1500 Controllers	#195 308	Includes 30 ft (9 m) 14-pin interconnect cable and 10 ft (3 m) motor cable		
Motor Extension Cable	#195 342	25 ft (7.6 m) motor cable extension		
Extension Cables	#043 725 #043 726 #043 727	25 ft (7.6 m), 14-pin 50 ft (15.2 m), 14-pin 75 ft (22.9 m), 14-pin		
Shunt Control for HDC 1500 A/DX	#195 052	Provides current feedback from competitive power sources		

Date:

Total Quoted Price:

Distributed by:

