

# Subarc DC Series

Issued August 2011 • Index No. DC/19.8

**Submerged Arc  
Welding Power Source** 

## Quick Specs

### Heavy Industrial Applications

Railcar  
Shipbuilding  
Heavy Fabrication  
Pipe Manufacturing  
Pressure Vessel

### Processes

Submerged Arc (SAW)  
Stick (SMAW)  
Air Carbon Arc Cutting  
and Gouging (CAC-A)

### Input Power

Requires 3-Phase Power

### Rated Output

**650/800:** 650 A at 44 VDC, 100% Duty Cycle  
**1000/1250:** 1000 A at 44 VDC, 100% Duty Cycle

### Weight

**650/800:** 545 lb (247 kg)  
**1000/1250:** 644 lb (292 kg)

## The Power of Blue.®

**DC multiprocess capability** provides versatility and outstanding arc performance in SAW (Submerged Arc) and CC (Stick, Carbon Arc Gouging).

**Internal digital voltage control (DVC)** enables operator to preset weld voltage in the CV mode before striking an arc.

**Built-in arc control** lets you get in tight without sticking the electrode. An electrode compensation circuit ensures consistent arc control performance regardless of the electrode size.

**Hot Start™** makes it easier to start difficult-to-start Stick electrodes such as E-6010 and E-7018.

**Line voltage compensation** ensures consistent weld performance by keeping output power constant even if primary input power varies by  $\pm 10\%$ .

**Simple control panel** features single range amperage/voltage adjustment. Provides easy, efficient operation.

**Digital voltmeter and ammeter** are easy to read, even at 30 ft (9.2 m).



Subarc DC 650 shown.

**14-pin receptacle** provides quick, direct connection to Miller 14-pin wire feeders and accessories.

**115 V duplex receptacle** provides 15 amps of auxiliary power.

**Remote on/off capabilities** allow operator to turn power source on/off from a distance.

**Remote voltage control** allows operator to change voltage from SAW Control.

**Power efficient** for exceptional value and return on your investment.

**Fan-On-Demand™** operates only when needed reducing noise, power consumption, and the amount of airborne contaminants pulled through the machine.

**Enclosed circuit boards** provide additional protection from contaminants resulting in longer service life.

**Power cord strain relief** provided for your convenience at installation.

**Thermal overload protection** light indicates power shutdown. Helps prevent machine damage if the duty cycle is exceeded or airflow is blocked.



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**



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An Illinois Tool Works Company  
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Appleton, WI 54914 USA

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**Web Site**  
[www.MillerWelds.com](http://www.MillerWelds.com)



# Subarc DC 650/800 Specifications (Subject to change without notice.)



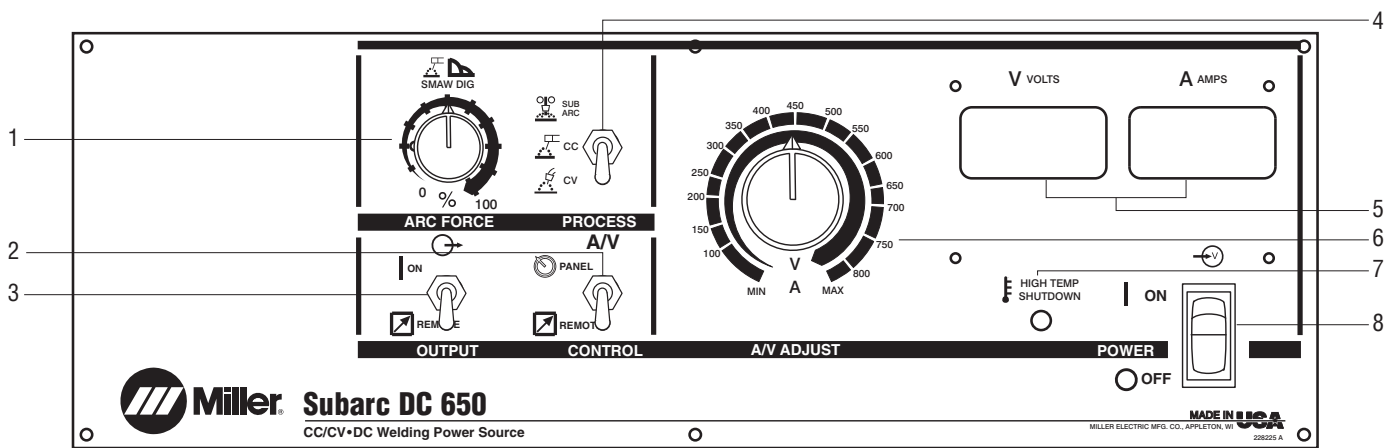
Rated Output	Amperage/Voltage Range	Max. Open-Circuit Voltage*	Amps Input at Rated Output, 50/60 Hz										Dimensions	Net Weight
			230 V	380 V	400 V	440 V	460 V	520 V	575 V	KVA	KW			
650 A at 44 VDC, 100% Duty Cycle	50–815 A in CC mode 10–65 V in CV mode	72 VDC	126	77	73	66	63	54	50.4	50	34.8	H: 27-1/4 in (692 mm) including lift eye W: 22-1/4 in (565 mm) D: 36 in (914 mm) including strain relief	545 lb (247 kg)	
			3.8**	1.9**	1.8**	1.6**	1.9**	1.1**	1.4**	1.52**	0.76**			

\*Open-circuit voltages in CV mode are factory set at values less than indicated for CC. \*\*While idling.

60 Hz model (650) is certified by Canadian Standards Association to both the Canadian and U.S. Standards.

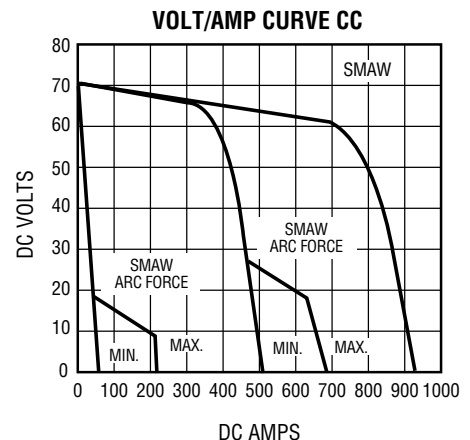
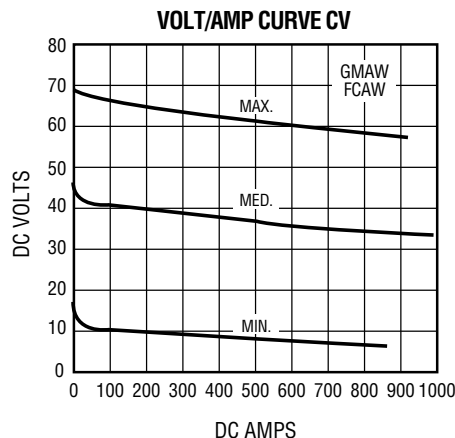
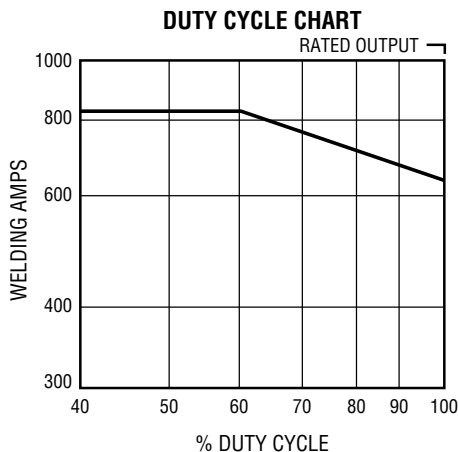
50/60 Hz model (800) with CE Specifications is manufactured according to the Standard IEC-60974-5.

## Control Panel



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

## Performance Data



# Subarc DC 1000/1250 Specifications (Subject to change without notice.)



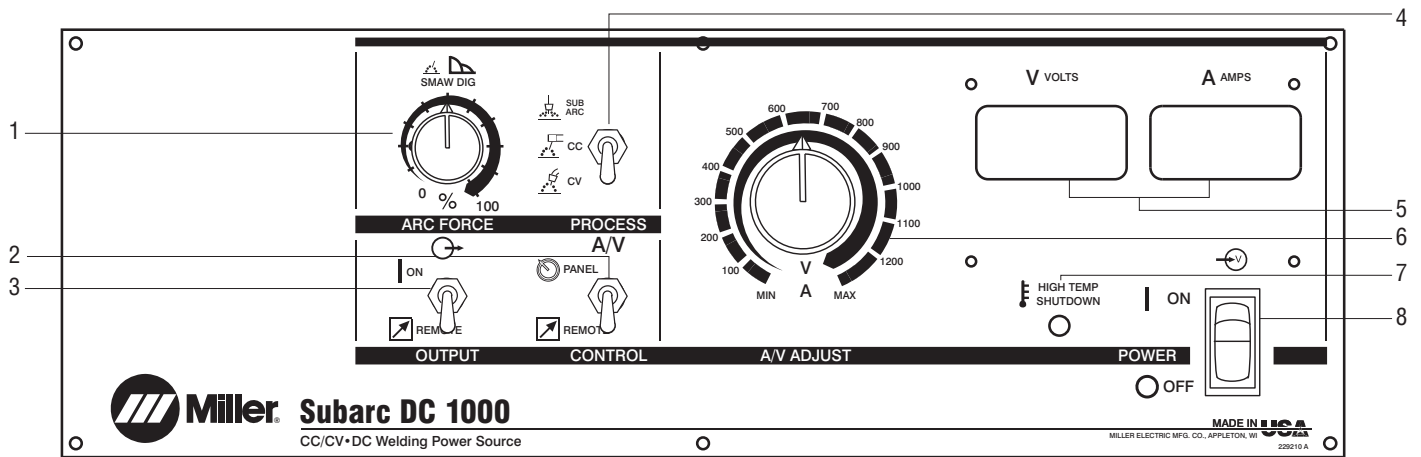
Rated Output	Amperage/Voltage Range	Max. Open-Circuit Voltage*	Amps Input at Rated Output, 50/60 Hz								Dimensions	Net Weight
			230 V	380 V	400 V	440 V	460 V	575 V	KVA	KW		
1000 A at 44 VDC, 100% Duty Cycle	100–1250 A in CC mode	66 VDC	180	109	104	94	90	72	73	53	H: 27-1/4 in (692 mm) including lift eye W: 22-1/4 in (565 mm) D: 36 in (914 mm) including strain relief	644 lb (292 kg)
	10–60 V in CV mode	38 VDC	5.8**	5.2**	5.0**	4.5**	2.9**	2.4**	3.2**	0.5**		

\*Open-circuit voltages in CV mode are factory set at values less than indicated for CC. \*\*While idling.

60 Hz model (1000) is certified by Canadian Standards Association to both the Canadian and U.S. Standards.

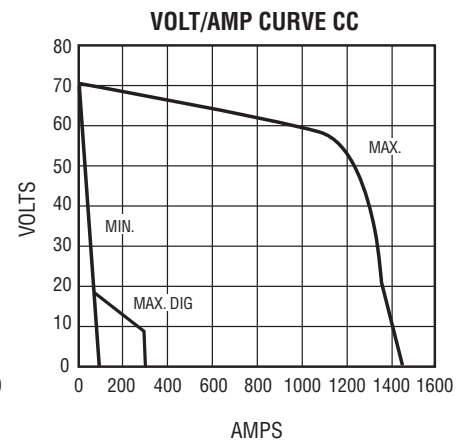
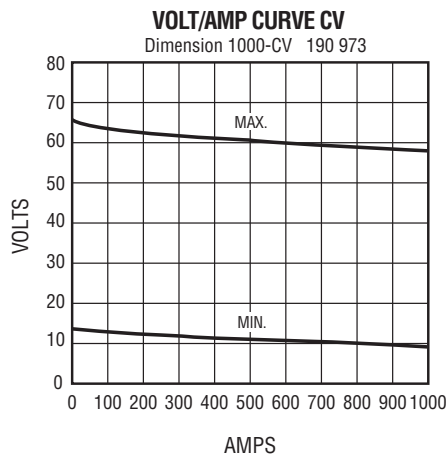
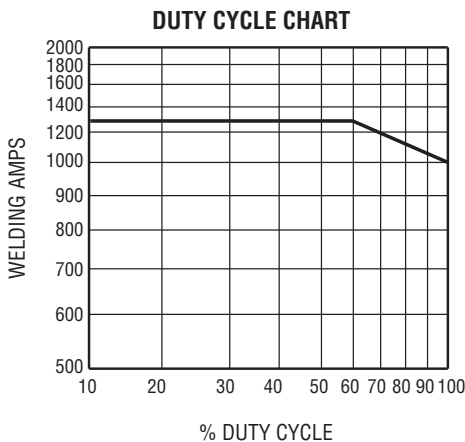
50/60 Hz model (1250) with CE Specifications is manufactured according to the Standard IEC-60974-5.

## Control Panel



- 1. Arc Force (DIG) Control
- 2. Remote Amperage/Voltage Control Switch
- 3. Output Switch (Contactor)
- 4. Process Selector Switch
- 5. Digital Meters
- 6. Amperage/Voltage Adjustment Control
- 7. High Temperature Shutdown Light
- 8. Power Switch with Indicator Light

## Performance Data



# HDC 1500 A and 1500 DX Controllers



HDC 1500 A (Analog Controller)

Internal terminal strip is able to integrate with positioners, sidebeams, turning rolls and other peripheral equipment.



HDC 1500 DX (Digital Controller)

## Specifications (Subject to change without notice.)

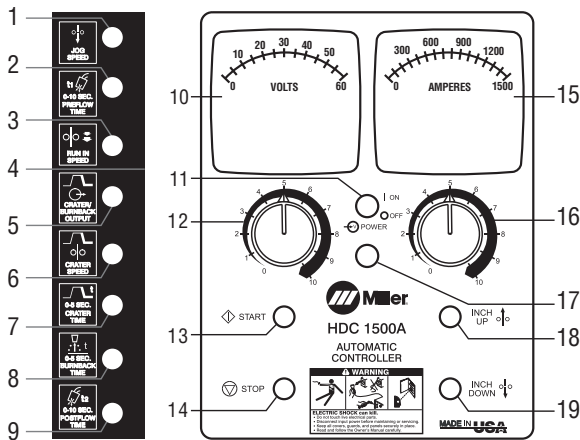


Controller	Type of Input from Welding Power Source	Welding Power Source Type	Weld Voltage and Amperage Capacity (AC or DC)	Dimensions	Weight
HDC 1500 A	Single-phase 115 VAC, 3.5 Amps, 50/60 Hz	Constant Current (CC), Constant Voltage (CV), AC or DC, with Remote Contactor and Output Control Capabilities	0–60 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)
HDC 1500 DX	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		

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

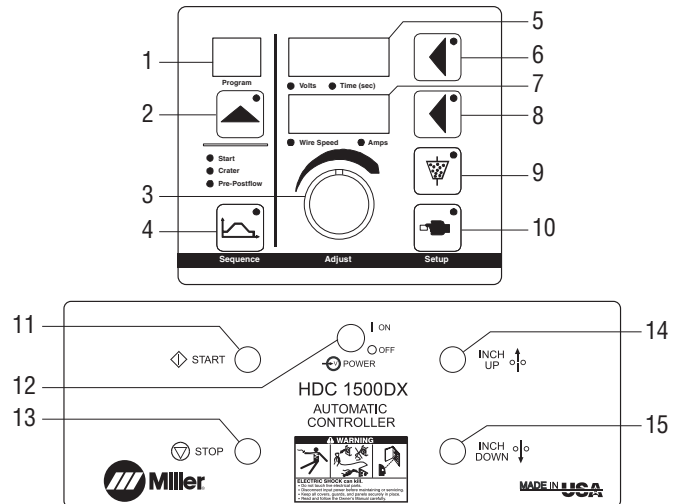
Manufactured according to the Standard IEC-60974-5.

## HDC 1500 A and 1500 DX Control Panels



HDC 1500 A (Analog Controller)

- |   |                                  |
|---|----------------------------------|
| 1. Jog Speed  | 10. Voltage Meter                |
| 2. Preflux Time 0–10 Seconds                            | 11. Power Switch                 |
| 3. Run-In Speed   | 12. Output Control Knob          |
| 4. CC/CV Switch (Located on Right Side of Access Panel) | 13. Start Button                 |
| 5. Crater/Burnback Output                               | 14. Stop Button                  |
| 6. Crater Speed   | 15. Amperage Meter               |
| 7. Crater Time 0–5 Seconds                              | 16. Wire Feed Speed Control Knob |
| 8. Burnback Time 0–5 Seconds                            | 17. Indicator Light              |
| 9. Postflow Time 0–10 Seconds                           | 18. Wire Inch Up                 |
|   | 19. Wire Inch Down               |



HDC 1500 DX (Digital Controller)

- |                              |                       |
|------------------------------|-----------------------|
| 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 |                       |

## Miller Tractor (For more information, see Literature Index No. DC/19.9.)

The Miller Tractor is a highly flexible self-contained welding unit comprised of a travel system and a variety of quality engineered components designed to produce precision, high-quality Submerged Arc welds.

Tractor comes complete with a main mounting mast and handle assembly, mounting arm for one wire reel, vertical and horizontal 4 x 4 inch slides, control support arm and one set of two adjustable guide roll arms.

The friction drive heavy-duty travel carriage utilizes a positive chain drive powering four rubber-tired wheels (operating temperature -30° to 125°F [-34° to 51°C]) with a closed-loop tach feedback for accurate speed control. A manual clutch enables freewheeling movement of the carriage. Remote pendant control box houses forward/stop/reverse switch and infinitely variable 4-turn speed potentiometer as well as LED display in IPM or cm/min. Available with either the HDC 1500 DX or 1500 A (see page 4).

### Package Includes:

- Tractor
- HDC weld controller
- RAD-400 drive motor
- Cable kit
- 25 lb (11.3 kg) capacity flux hopper with valve
- 60 lb (27 kg) wire reel
- Wire straightener
- OBT 600 torch
- Tractor guide rolls
- Remote start/stop control

*Note: Order drive rolls, contact tips, and extension cords of appropriate length separately.*

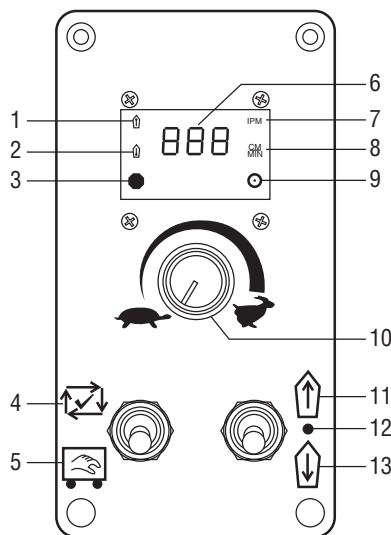


## Specifications (Subject to change without notice.)

Wire Feed Speed	Wire Size Range	Max. Incline	Gun Positioning Slides	Supply Voltage (from HDC 1500)	Drive Motor	Max. Spool Size Capacity	Travel Speed	Dimensions*	Weight
20–400 IPM (0.5–10 m/min)	3/32–7/32 in (2.4–5.6 mm)	30° depending on mounting configuration	4 in (101.6 mm) vertical and horizontal stroke	115 VAC, 1-Phase, 50/60 Hz, 200 watts	24 VDC permanent magnet gear motor	60 lb (27 kg)	4–66 IPM (0.1–1.68 m/min)	H: 43-3/8 in (1102 mm) D: 35-1/2 in (903 mm)	162 lb (73 kg) without flux/wire

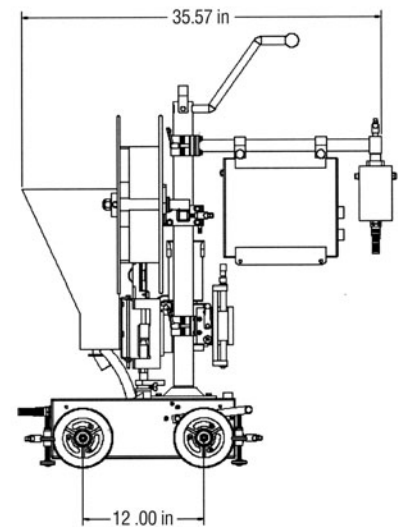
\*Width will vary depending on how system is configured.

## Tractor Speed Control Panel and Line Drawings



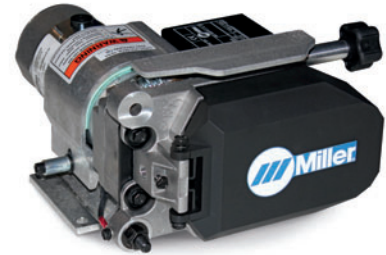
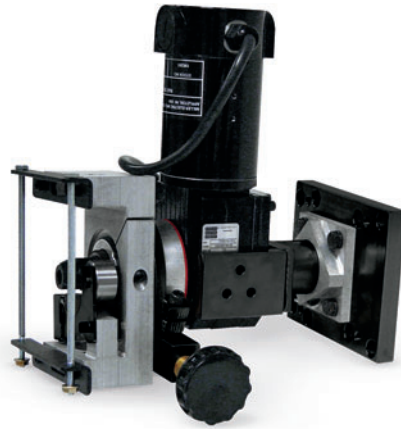
1. Forward Motion Command Indicator
2. Reverse Motion Command Indicator
3. Hold (Stop) Mode Active Indicator
4. Auto Enable Mode
5. Manual Carriage Mode

6. Speed and Parameter Display
7. Speed Display Indicator
8. Speed Display Indicator (Calibrated in Centimeters per Minute)



9. Programming Mode Indicator (Flashing)
10. Speed Adjustment
11. Command Forward Motion
12. Neutral
13. Command Reverse Motion

# Wire Drive Assemblies



**RAD-100 #300 474**  
Heavy-duty, right-angle wire drive assembly designed for automated strip clad applications.

**RAD-400 #195 265** Standard-speed  
**RAD-780 #195 266** High-speed  
Right-angle wire drive assembly includes adapter plate allowing mounting to 2-1/2, 4-1/4, and 4-5/8 inch bolt hole patterns.

**SAW4 #300 481**  
Standard-speed wire drive assembly for smaller than 1/8 in wires.

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

Model	Input Power	Rating	Motor Speed	Ratio	Rated Torque	Rated Output Speed	Wire Feed Speed	Wire Diameter Range	Input Weld Circuit Rating	Input Power Cord	Weight
RAD-100	115 VDC	1/5 HP	2500 RPM	120:1	290 in-lb	21 RPM	—	—	—	2 ft (0.6 m)	13.9 lb (6.3 kg)
RAD-400	115 VDC	1/4 HP, 85 RPM	—	—	—	—	20–400 IPM (0.5–10 m/min)	5/64–7/32 in (2.0–5.6 mm)	100 Volts, 1000 Amps, 100% Duty Cycle	2 ft (0.6 m)	33 lb (15 kg)
RAD-780	115 VDC	1/4 HP, 143 RPM	—	—	—	—	30–780 IPM (0.7–19.8 m/min)	1/16–1/8 in (1.6–3.2 mm)	100 Volts, 1000 Amps, 100% Duty Cycle	2 ft (0.6 m)	33 lb (15 kg)
SAW4	115 VDC, 0.75 A	1/8 HP, 180 RPM	—	9.2:1	—	—	50–780 IPM (1.3–19.8 m/min)	.045–3/32 in (1.1–2.4 mm)	—	2 ft (0.6 m)	16.5 lb (7.5 kg)

## Drive Rolls

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



#132 955 1/16 in (1.5 mm)

#132 960 5/64 in (2.0 mm)

#132 961 3/32 in (2.4 mm)

#132 962 7/64 in (2.8 mm)

#132 963 1/8 in (3.2 mm)

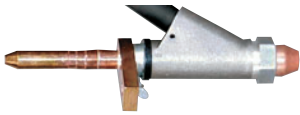
#193 700 5/32 in (3.9 mm)

#193 701 3/16 in (4.7 mm)

#193 702 7/32 in (5.5 mm)

# Components and Accessories

## Submerged Arc Torches



**OBT 600 #043 923**  
600-amp, 100% 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**  
**#043 967** 1 inch  
**#043 969** 2 inch  
**#043 973** 4 inch  
**#043 975** 6 inch



**OBT 1200 #043 900**  
1200-amp, 100% 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

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

## Flux Handling Equipment



**Flux Hopper with Valve #194 775**  
Flux hopper with 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. Includes 11 ft power cord.

**Flux Hopper Extension Cable #300 484**  
10 ft (3 m) power cord extension cable for Flux Hopper.

**Flux Recovery Systems**  
 Weld Engineering 1-508-842-2224  
 American Vacuum 1-800-321-2849  
 Invincible 1-800-282-6999

## Accessories



**Parallel Control Box #194 711**  
Must be used when paralleling two units.

**Wire Straightener**  
**#199 733** For RAD-400 and RAD-780.  
Optimized for 1/8 in (3.2 mm) or larger wires.  
**#141 581** For SAW  
For wires smaller than 1/8 in (3.2 mm).

**Light-Duty Cross Slide #195 411**  
Allows 6 inches of travel adjustment. Two units can be stacked to provide vertical and horizontal movement. **Not recommended for tandem.**

**Heavy-Duty Cross Slide #300 482**  
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 inches 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.

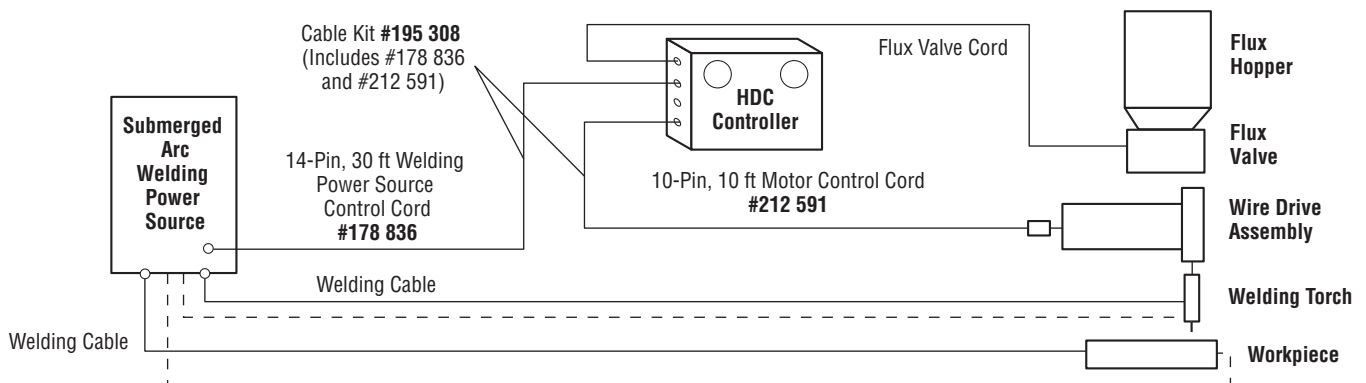
**Cable Kit for HDC 1500 Controllers #195 308**  
Includes 30 ft (9 m) 14-pin interconnect cable and 10 ft (3 m) motor cable.

**Tractor Cable Kit #300 218**  
Includes 24 in (0.6 m) 14-pin interconnect cable and 24 in (0.6 m) motor cable.

**Motor Extension Cable #195 342**  
25 ft (7.6 m) extension for the motor cable.

**Control Cable Extensions\***  
**#242 205 025** 25 ft (7.6 m)  
**#242 205 050** 50 ft (15 m)  
**#242 205 080** 80 ft (24.4 m)  
14-pin welding power source control cable. Extends distance between power source and controller.  
*\*Custom lengths available in 5 ft increments up to 50 ft and 10 ft increments up to 100 ft.*

## Typical Installation



Sense Leads (customer supplied) connected to the power source are required for optimal performance.

# Ordering Information

Equipment and Options	Stock No.	Description	Qty.	Price
<b>Subarc DC 650</b>	<b>#907 338</b>	230/460/575 V, 60 Hz		
<b>Subarc DC 800</b>	<b>#907 344</b>	380/400/440 V, 50/60 Hz w/CE		
<b>Subarc DC 1000</b>	<b>#907 342</b>	230/460/575 V, 60 Hz		
<b>Subarc DC 1250</b>	<b>#907 343</b>	380/400/440 V, 50/60 Hz w/CE		
<b>Controllers</b>				
HDC 1500 A	<b>#300 439</b>	CC/CV, AC/DC analog controller		
HDC 1500 DX	<b>#300 438</b>	CV, AC/DC digital controller		
<b>Miller Tractor</b>				
MT 1500 A	<b>#951 061</b>	With HDC 1500 A analog controller. See Lit. Index No. DC/19.9		
MT 1500 DX	<b>#951 060</b>	With HDC 1500 DX digital controller. See Lit. Index No. DC/19.9		
<b>Drive Motors</b>				
RAD-100	<b>#300 474</b>	Heavy-duty, right-angle drive motor for automated strip clad applications		
RAD-400	<b>#195 265</b>	Standard-speed, right-angle drive assembly for 1/8 in or larger wires		
RAD-780	<b>#195 266</b>	High-speed, right-angle drive assembly for 1/8 in or larger wires		
SAW4	<b>#300 481</b>	Standard-speed assembly for smaller than 1/8 in wires		
Drive Rolls		See chart on page 6		
<b>Torches</b>				
OBT 600	<b>#043 923</b>	600 amp, 100% duty cycle, air-cooled		
OBT 600 Torch Body Extensions	<b>#043 967</b>	1 inch		
	<b>#043 969</b>	2 inch		
	<b>#043 973</b>	4 inch		
	<b>#043 975</b>	6 inch		
OBT 1200	<b>#043 900</b>	1200 amp, 100% duty cycle, air-cooled		
OBT 1200 Torch Body Extension	<b>#043 981</b>	9 inch		
Contact Tips		See chart on page 7		
<b>Flux Handling Equipment</b>				
Flux Hopper with Valve	<b>#194 775</b>	25 lb capacity		
Flux Hopper Extension Cable	<b>#300 484</b>	10 ft (3 m) power cord extension cable for Flux Hopper		
Flux Recovery Systems		See page 7		
<b>Accessories</b>				
Parallel Control Box	<b>#194 711</b>	Must be used when paralleling two units		
Wire Straightener	<b>#199 733</b>	For RAD-400 and RAD-780		
	<b>#141 581</b>	For SAW4		
Light-Duty Cross Slide	<b>#195 411</b>	Provides 6-in travel adjustment, load capacity of 150 lb		
Heavy-Duty Cross Slide	<b>#300 482</b>	Provides 6-in travel adjustment, load capacity of 250 lb		
Wire Reel	<b>#108 008</b>	For 60 lb (27 kg) coil, requires Spool Support Assembly <b>#119 438</b>		
Spool Support Assembly	<b>#119 438</b>	Support for 60 lb reels		
Cable Kit for HDC 1500 Controllers	<b>#195 308</b>	Includes 30 ft (9 m) 14-pin interconnect cable and 10 ft (3 m) motor cable		
Tractor Cable Kit	<b>#300 218</b>	Includes 24 in (0.6 m) 14-pin interconnect cable and 24 in (0.6 m) motor cable		
Motor Extension Cable	<b>#195 342</b>	25 ft (7.6 m) motor cable extension		
Control Cable Extensions	<b>#242 205 025</b>	25 ft (7.6 m), 14-pin		
	<b>#242 205 050</b>	50 ft (15.2 m), 14-pin		
	<b>#242 205 080</b>	80 ft (24.4 m), 14-pin		

Date:

Total Quoted Price:

Distributed by:

