

# SubArc Digital Series

**Submerged Arc  
Welding Power Source**



## Quick Specs

### Heavy Industrial Applications

- Railcar
- Shipbuilding
- Heavy fabrication
- Pipe manufacturing
- Pressure vessel

### Processes

- Submerged arc (SAW)
- Electroslag (ESW)
- Air carbon arc cutting and gouging (CAC-A)

### Input Power

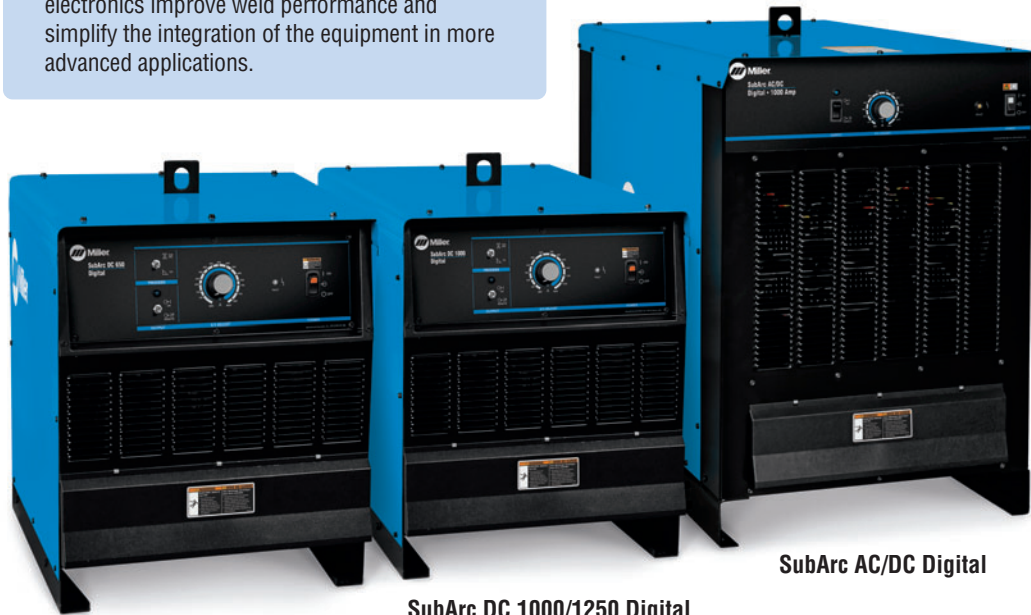
Requires 3-phase power

### Rated Output

- DC 650/800:** 650 A at 44 V, 100% duty cycle
- DC 1000/1250:** 1,000 A at 44 V, 100% duty cycle
- AC/DC:** 1,000 A at 44 V, 100% duty cycle

### SubArc Digital Series

- Choice of three power sources, two interface controls and a range of wire drive motors and accessories.
- Digital process control technology.
- Highly reliable thyristor power regulation.
- Newly designed digital control and communication electronics improve weld performance and simplify the integration of the equipment in more advanced applications.



SubArc DC 650/800 Digital

SubArc DC 1000/1250 Digital

SubArc AC/DC Digital

### Easier setup and operation.

The SubArc Digital Series interface controls recognize the power source and wire drive connected, and automatically configure the system for proper operation. The easy-to-understand interface provides the operator with the necessary controls to set process parameters and control output. The power sources feature simplified parallel and tandem setups — just plug the cable into the appropriate connectors.

### Improved flux delivery system.

Our new SubArc flux hopper utilizes a flux valve mechanism that assures continuous delivery of flux to the arc. The unique valve design provides a barrier between the flux and actuation device to help prevent jamming of the solenoid actuator due to dust and debris. A sight glass is provided on the front of the flux hopper allowing the weld operator to visually monitor the remaining flux in the hopper.

### Low-voltage accessory operation and improved environmental protection.

The new digital series accessories are powered with 24 VAC control voltage from the power source. All power sources, interface controls and wire drives are IP-23 rated providing a high level of protection for harsh environments.

**All power sources also feature thermal overload protection, line voltage compensation and Fan-On-Demand™.**

### Easy to integrate.

Our new SubArc power sources are easy to integrate by using a standard Modbus® connection. Different levels of integration are possible, from simple remote operation to more complex automated systems.



### Two DC power source models and one AC/DC power source model.

Power sources have sufficient power capacity to cover applications from traditional DC single-arc to multi-wire tandem welding. In the case of electroslag welding or other high-current demand, two or more power sources can easily be paralleled (both DC and AC/DC machines).



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

Miller recommends



**Miller Electric Mfg. Co.**  
An ITW Welding Company  
1635 West Spencer Street  
P.O. Box 1079  
Appleton, WI 54912-1079 USA

**Equipment Sales US and Canada**  
Phone: 866-931-9730  
FAX: 800-637-2315  
International Phone: 920-735-4554  
International FAX: 920-735-4125

MillerWelds.com  
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# SubArc DC Digital



**SubArc DC 650/800 Digital and DC 1000/1250 Digital** cover most single- and twin-wire applications. These traditional transformer/rectifier power sources combine high efficiency with the highest reliability. They also feature state-of-the-art digital-control electronics to provide best-in-class welding performance and repeatability.

## SubArc DC Digital Specifications (Subject to change without notice.)



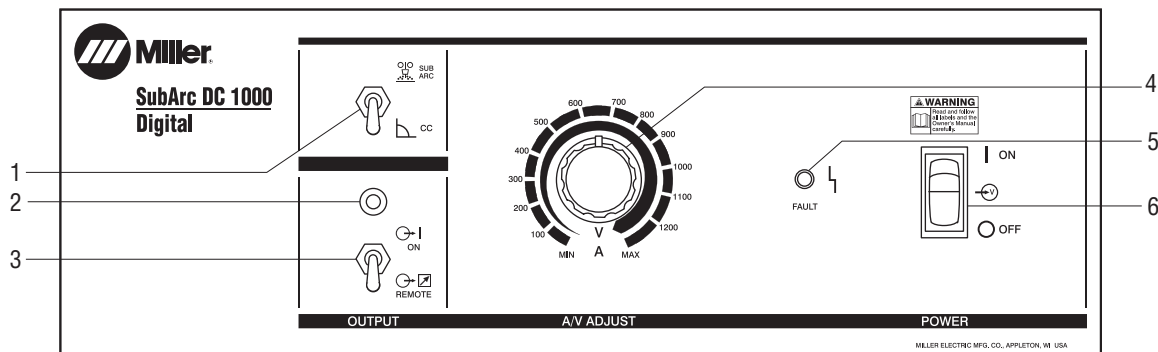
Model	Amperage/Voltage Ranges	Rated Output	IP Rating	Amps Input at Rated Load Output, 60 Hz 230 V 460 V 575 V	Amps Input at Rated Load Output, 50 Hz 380 V 400 V 440 V	KVA	KW	Maximum Open-Circuit Voltage DC**	Dimensions	Net Weight
SubArc DC 650 Digital	50–815 A in CC mode	650 A at 44 V, 100% duty cycle	IP23	126 63 50.4 3.8* 1.9* 1.4*	— — —	50 1.52*	34.8 0.76*	75 Vpk	H: 30 in. (762 mm) (including lift eye) W: 23 in. (584 mm) D: 38 in. (965 mm) (not including strain relief)	593 lb. (269 kg)
SubArc DC 800 Digital	20–44 V in sub arc mode	815 A at 44 V, 60% duty cycle		— — —	95 90 83 1.9* 1.8* 1.6*					603 lb. (273 kg)
SubArc DC 1000 Digital	100–1,250 A in CC mode	1,000 A at 44 V, 100% duty cycle	IP23	180 90 72 5.8* 2.9* 2.4*	— — —	73 3.2*	53 0.5*	68 Vpk		682 lb. (309 kg)
SubArc DC 1250 Digital	20–44 V in sub arc mode	1,250 A at 44 V, 60% duty cycle		— — —	135 128 117 5.2* 5.0* 4.5*					681 lb. (309 kg)

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

SubArc DC 650 Digital and DC 1000 Digital models are certified by Canadian Standards Association to both the Canadian and U.S. Standards.

All SubArc DC Digital models are manufactured and certified in accordance with IEC-60974-1, -10.

## SubArc DC Digital Control Panel



1. Process Selector Switch
2. Output Indicator Light
3. Output Switch (Contactor)

4. Amperage/Voltage Adjustment Control
5. Fault Indicator
6. Power Switch

## SubArc AC/DC Digital



**SubArc AC/DC Digital and SubArc AC/DC 1250 Digital.** AC welding output enables the SubArc AC/DC to be used in tandem-arc welding systems with a DC lead arc and AC trailing arc, or with AC/AC arc combinations. Using multiple arcs increases deposition rate, resulting in shorter welding cycles for very thick weldments without compromising quality. All AC balance control

modes can be set on the SubArc Interface Digital. The easy-to-understand interface includes two DC modes and 12 best-practice AC balance settings. In multiple-arc configurations, the system automatically adjusts the phase shifting between power sources thereby eliminating arc interaction. There is no need to employ a laptop PC for complex wave shaping before operation.

## SubArc AC/DC Digital Specifications (Subject to change without notice.)



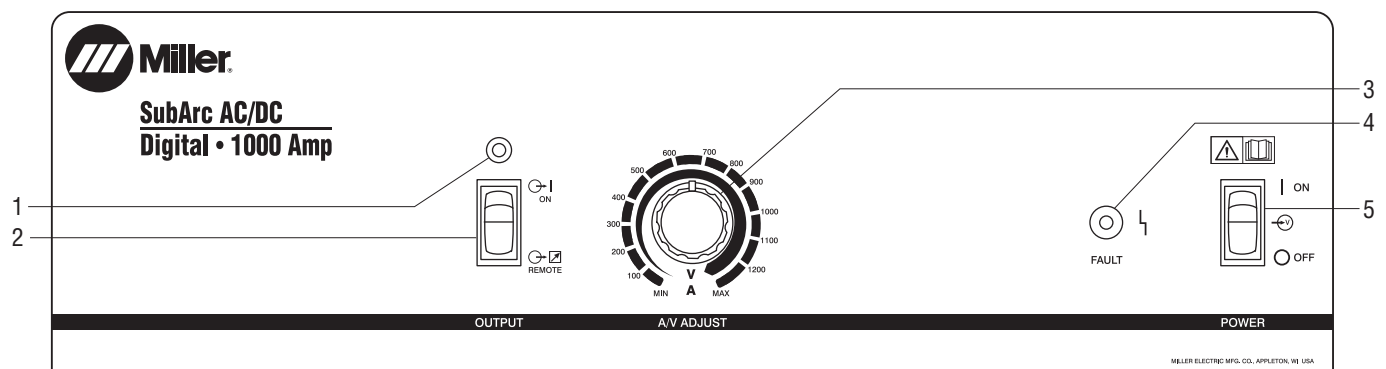
Model	Amperage/ Voltage Ranges	Rated Output	IP Rating	Amps Input at Rated Load Output				KVA	KW	Maximum Open-Circuit Voltage DC	Dimensions	Net Weight
				460 V (60 Hz)	380 V (50 Hz)	400 V (50 Hz)						
SubArc AC/DC Digital	300–1,250 A in CC mode	1,000 A at 44 V, 100% duty cycle	IP23	122 3.0*	—	—	98 2.37*	53 0.95*	93 Vpk	H: 43 in. (1,092 mm) (including lift eye) W: 28 in. (711 mm) D: 48 in. (1,219 mm) (not including strain relief)	1,187 lb. (538 kg)	
SubArc AC/DC 1250 Digital	20–44 V in sub arc mode	1,250 A at 44 V, 60% duty cycle		—	179 3.0*	176 3.0*					122 2.37*	67 0.95*

\*While idling.

SubArc AC/DC Digital is certified by Canadian Standards Association to both the Canadian and U.S. Standards.

Both SubArc AC/DC Digital models are manufactured and certified in accordance with IEC-60974-1, -10.

## SubArc AC/DC Digital Control Panel

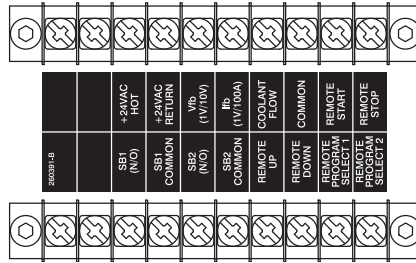


1. Output Indicator Light
2. Output Switch (Contactor)
3. Amperage/Voltage Adjustment Control
4. Fault Indicator
5. Power Switch

# SubArc Interface



SubArc Interface Analog



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



SubArc Interface Digital

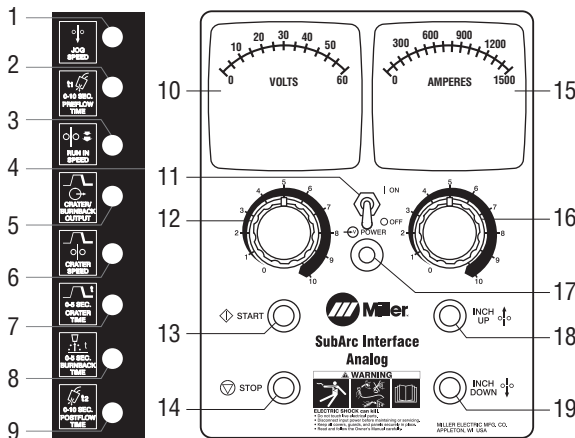
## SubArc Interface Specifications (Subject to change without notice.)

Model	Input Power from Welding Power Source	Welding Power Source Type	Weld Voltage and Amperage Capacity	Dimensions	Net Weight
SubArc Interface Analog	24 VAC, single-phase 25 A, 50/60 Hz	Constant current (CC), constant voltage (CV), DC with remote contactor and output control capabilities	0–60 V 0–1,500 A	H: 11.5 in. (292 mm) W: 12 in. (305 mm) D: 7 in. (178 mm)	15.8 lb. (7.2 kg)
SubArc Interface Digital	24 VAC, single-phase 25 A, 50/60 Hz	Constant voltage (CV), AC or DC, with remote contactor and output control capabilities	0–60 V 0–1,500 A		

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

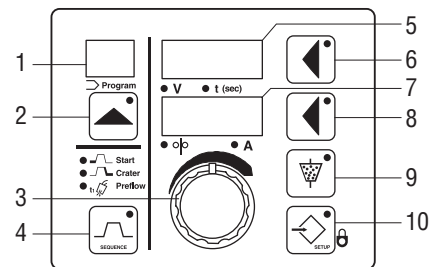
Manufactured according to the Standard IEC-60974-1, -5, -10.

## SubArc Interface Control Panels



SubArc Interface Analog

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

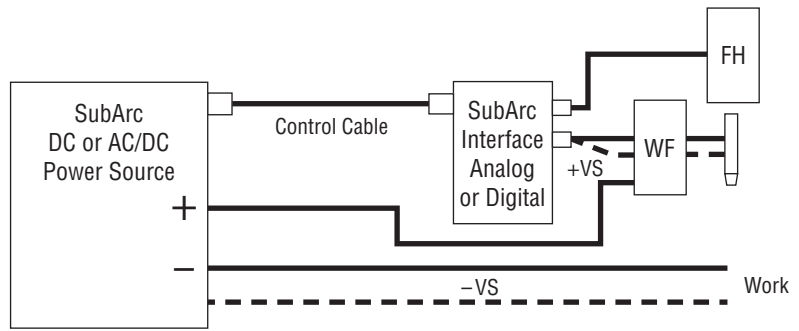


SubArc Interface Digital

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

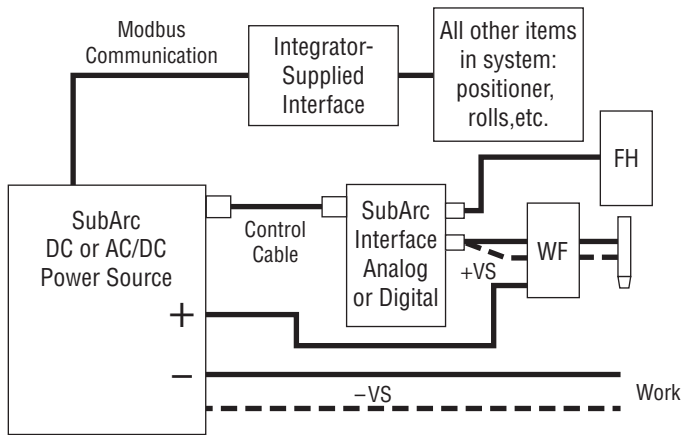
## SubArc Interface Setup

In the new setup the positive sense lead is integrated in the wire feeder motor cable and control cable. A customer supplied negative sense lead is required for optimal performance.



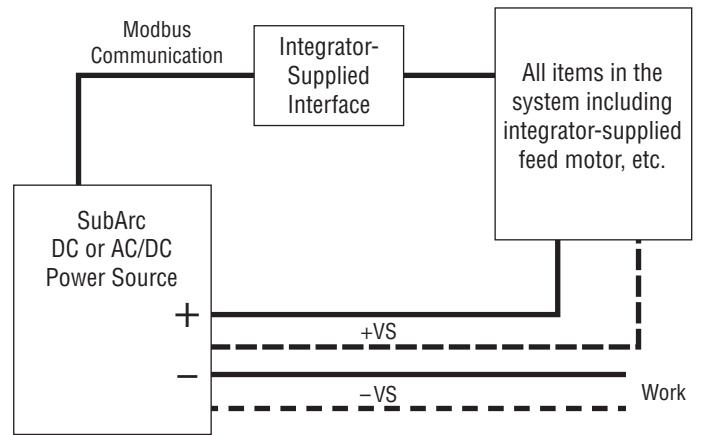
## SubArc Modbus® Operation

### Easy Method



**Easy method** of integrating standard components while controlling them over Modbus communication. Using the standard SubArc interface, wire feed motor and flux hopper, an integrator can remotely adjust settings and operation of the SubArc interface. A separate document with interfacing information is available.

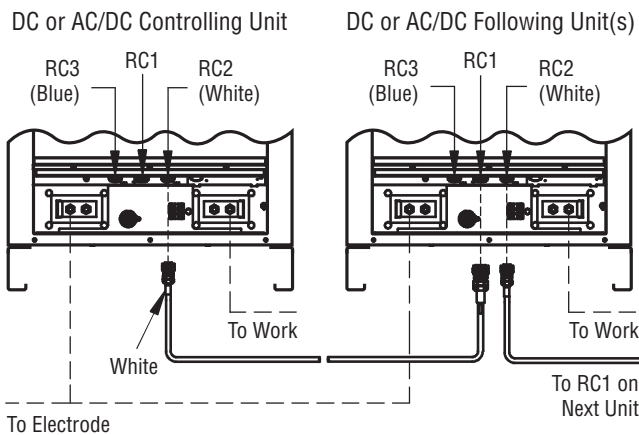
### High-Level Method



**High-level method** where the integrator solely uses the digital power sources and controls them over Modbus communication. Benefits from Miller technology-driven arc performance while integrating into a custom-made welding solution.

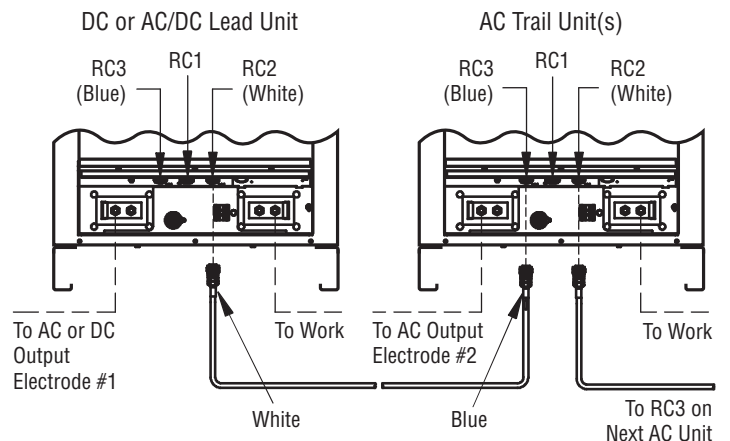
## SubArc System Parallel and Tandem Setups

### Parallel Connections



**Parallel setup.** Only like power sources can be paralleled. Paralleling of two machines to increase maximum welding current is simply done by connecting the paralleling cable from RC2 on the first unit to RC1 on the second unit. This works for both DC as well as AC/DC machines. Daisy chaining multiple machines to gain higher output is done in the same way. No special tools, laptop or software needed... plug and play.

### Tandem Connections



**Tandem setup.** To use two or more AC arcs, the arc must be phase shifted to prevent arc to arc interaction. This is simply done by connecting the tandem cable from RC2 on the first unit to RC3 on the second unit. This automatically sets the optimum phase shift for AC welding. No special tools, laptop or software needed... plug and play.



## Wire Drive Assemblies



### SubArc Strip Drive 100 Digital Low Voltage 300940

Heavy-duty, right-angle wire drive assembly with mounting bracket. Designed for automated strip clad applications.



### SubArc Wire Drive 400 Digital Low Voltage 300938

**300938001** For use with tractor  
Standard-speed, right-angle wire drive assemblies.

### SubArc Wire Drive 780 Digital Low Voltage 300941

High-speed, right-angle wire drive assembly.

## Wire Drive Assembly Specifications (Subject to change without notice.)

Model	Input Power	Input Power Cord	Rating	Wire Feed Speed	Wire Diameter Capacity	Net Weight
SubArc Strip Drive 100 Digital Low Voltage	38 VDC	4 ft. (1.2 m)	1/5 hp, 21 rpm	10–125 ipm (0.3–3.2 m/min.)	N/A (strip cladding applications)	20 lb. (9.1 kg)
SubArc Wire Drive 400 Digital Low Voltage	38 VDC	4 ft. (1.2 m)	1/5 hp, 85 rpm	30–400 ipm (0.8–10.2 m/min.)	3/32–3/16 in. (2.4–4.8 mm)	26 lb. (11.8 kg)
SubArc Wire Drive 400 Digital Low Voltage for Tractor						
SubArc Wire Drive 780 Digital Low Voltage	38 VDC	4 ft. (1.2 m)	1/4 hp, 143 rpm	50–780 ipm (1.3–19.8 m/min.)	1/16–1/8 in. (1.6–3.2 mm)	26 lb. (11.8 kg)

## Accessories

### Drive Rolls

- 132955** 1/16 in. (1.6 mm)
- 132960** 5/64 in. (2.0 mm)
- 132961** 3/32 in. (2.4 mm)
- 132962** 7/64 in. (2.8 mm)
- 132963** 1/8 in. (3.2 mm)
- 193700** 5/32 in. (4.0 mm)
- 193701** 3/16 in. (4.8 mm)



### Cables



#### SubArc Control Cables

- 260622030** 30 ft. (9.1 m)
- 260622050** 50 ft. (15.2 m)
- 260622060** 60 ft. (18.3 m)
- 260622080** 80 ft. (24.4 m)
- 260622100** 100 ft. (30.5 m)
- 260622120** 120 ft. (36.6 m)
- 260622200** 200 ft. (61.0 m)

Cable between SubArc Interface and power source.



#### Motor Extension Cables

- 254232005** 5 ft. (1.5 m)
- 254232010** 10 ft. (3 m)
- 254232025** 25 ft. (7.6 m)
- 254232065** 65 ft. (19.8 m)

Cable between SubArc Interface and drive motor.



#### Flux Hopper Extension Cables

- 260623010** 10 ft. (3 m)
- 260623025** 25 ft. (7.6 m)
- 260623065** 65 ft. (19.8 m)

Cable between SubArc Interface and flux hopper.



#### SubArc Parallel Cable

- 260775015**  
15 ft. (4.6 m)



#### SubArc Tandem Cable

- 260878015**  
15 ft. (4.6 m)



- Insight Core™ to SubArc Digital Series Adapter**  
**301295**

# Accessories

## Submerged Arc Torches



**OBT 600 043923**  
600-amp 100-percent-duty-cycle torch with concentric flux flow nozzle. Can be used with 1/16–3/16 inch (1.6–4.8 mm) wire.

### OBT 600 Torch Body Extensions

- 043967** 1 in. (25.4 mm)
- 043969** 2 in. (50.8 mm)
- 043973** 4 in. (101.6 mm)
- 043975** 6 in. (152.4 mm)



**OBT 1200 043900**  
1,200-amp 100-percent-duty-cycle torch with concentric flux flow nozzle. Can be used with 1/16–3/16 inch (1.6–4.8 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 043981

Overall length with extension is 9 inches (228.6 mm). Actual length of extension is 8.5 inches (215.9 mm).

### OBT Torch Contact Tips

OBT 600	OBT 1200	Wire Size
<b>192700</b>	<b>192141</b>	1/16 in. (1.6 mm)
<b>192701</b>	<b>199026</b>	5/64 in. (2.0 mm)
<b>192702</b>	<b>192142</b>	3/32 in. (2.4 mm)
<b>192703</b>	<b>200771</b>	7/64 in. (2.8 mm)
<b>192704</b>	<b>192143</b>	1/8 in. (3.2 mm)
<b>192705</b>	<b>192144</b>	5/32 in. (4.0 mm)
	<b>192136</b>	3/16 in. (4.8 mm)



**1,200-Amp Single-Wire Torch 301141**  
Short, 11.3 in. (288 mm). 1,200-amp torch for 1/16 – 5/32 in. (1.6–4.0 mm) wires.

### 1,200-Amp Single-Wire Torch Contact Tips

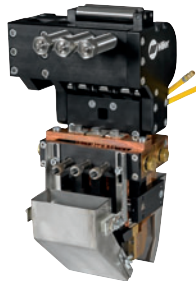
- 264590** 1/16 in. (1.6 mm)
- 264591** 5/64 in. (2.0 mm)
- 264487** 3/32 in. (2.4 mm)
- 264593** 1/8 in. (3.2 mm)
- 264594** 5/32 in. (4.0 mm)



**1,200-Amp Twin-Wire Torches**  
**301143** Short, 11.3 in. (288 mm)  
**301144** Long, 16.8 in. (427 mm)  
1,200-amp torches for 3/64–3/32 inch (1.2–2.4 mm) wires.

### 1,200-Amp Twin-Wire Torch Contact Tips

- 264595** 3/64 in. (1.2 mm)
- 264596** 1/16 in. (1.6 mm)
- 264597** 5/64 in. (2.0 mm)
- 264588** 3/32 in. (2.4 mm)



### 30–90 mm External Cladding Head 301167

3,000-amp 100%-duty-cycle water-cooled external cladding head for submerged arc and electroslag cladding. For use with 30–90 mm strip. See literature AY/52.0 for more information



### SubArc Flux Hopper Digital Low Voltage 300942

25-pound-capacity flux hopper with automatic flux valve. The opening is sized to allow hook-up of any flux-hopper-mounted recovery system. Includes slag screen and

11-foot (3.3 m) power cord.



### Single-Wire Straightener 199733

For use with SubArc Wire Drive 400 Digital Low Voltage or 780 Digital Low Voltage. For 1/16–3/16 inch (1.6–4.8 mm) wires.



**Twin-Wire Straightener**  
**301160** Single adjustment  
**301162** Double/separate adjustment  
For twin-wire torches only.



**Wire Reel 108008**  
For 60-pound (27 kg) coil of wire. Requires Spool Support Assembly (119438).

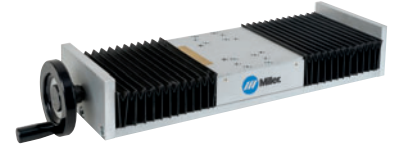
**Spool Support Assembly 119438**  
For 60-pound (27 kg) wire reel.



**SubArc Tandem Bracket 301135**

**SubArc Single Mounting Bracket 301134**

**SubArc Mounting Hinge 301136**



### Manual Slide 301137

Manual slide for smooth and accurate movement of the welding head. Slide allows for 7.87 inch (200 mm) travel adjustment with load capacity of 220 pounds (100 kg) at 1.64 feet (500 mm). **Not recommended for tandem.**



### SubArc Tractor

**300945** Tractor only  
**951615** Analog weld control package  
**951614** Digital weld control package  
SubArc tractor packages include SubArc tractor with remote start/stop control and guide rolls, SubArc Interface weld controller (analog or digital), SubArc Wire Drive 400 for tractor, 25-pound (11.3 kg) capacity flux hopper with valve, 60-pound (27 kg) wire reel, OBT 600 torch and wire straightener. See literature AD/7.5 for more information.

## Welding Intelligence™



**14-pin Insight Core™ Module 301072**  
Insight Core is a simplified, internet-based industrial welding

information management solution that monitors and reports welding activity for basic productivity and quality metrics. Requires Insight Core to SubArc Digital Series Adapter (301295). See Insight Core brochure 266011 for more information.

### ArcAgent™ Auto 301346

See literature WI/1.0 for more information.

## Ordering Information

Equipment and Options	Stock No.	Description	Qty.	Price
SubArc DC 650 Digital	907622	230/460/575 V, 60 Hz		
SubArc DC 800 Digital (50 Hz) CE	907623	380/400/440 V, 50 Hz		
SubArc DC 1000 Digital	907624	230/460/575 V, 60 Hz		
SubArc DC 1250 Digital (50 Hz) CE	907625	380/400/440 V, 50 Hz		
SubArc AC/DC Digital	907620	460 V, 60 Hz		
	951618	575 V, 60 Hz with 575 V to 460 V step-down transformer		
SubArc AC/DC 1250 Digital (50 Hz) CE	907621	380/400 V, 50 Hz		
<b>Controls</b>				
SubArc Interface Analog	300937	CC/CV, DC analog control		
SubArc Interface Digital	300936	CV, AC/DC digital control		
<b>Drive Motors</b>				
SubArc Strip Drive 100 Digital Low Voltage	300940	Heavy-duty, right-angle wire drive assembly with mounting bracket		
SubArc Wire Drive 400 Digital Low Voltage	300938	Standard-speed, right-angle drive assembly. Maximum speed 400 ipm (10 mpm)		
	300938 001	Same as above for use with Tractor		
SubArc Wire Drive 780 Digital Low Voltage	300941	High-speed, right-angle drive assembly. Maximum speed 780 ipm (19.8 mpm)		
Drive Rolls		See page 6		
<b>Torches</b>				
OBT 600	043923	600 amp, 100% duty cycle, air cooled		
OBT 600 Torch Body Extensions		See page 7		
OBT 1200	043900	1,200 amp, 100% duty cycle, air cooled		
OBT 1200 Torch Body Extension	043981	9 in. (228.6 mm)		
1,200-Amp Single-Wire Torch	301141	Short, 11.3 in. (288 mm), 1,200 amp		
1,200-Amp Twin-Wire Torches	301143	Short, 11.3 in. (288 mm), 1,200 amp		
	301144	Long, 16.8 in. (427 mm), 1,200 amp		
Contact Tips		See page 7 for contact tips for all torches		
30–90 mm External Cladding Head	301167	3,000-amp, 100%-duty-cycle, water-cooled. For use with 30 to 90 mm strip.		
<b>Accessories</b>				
SubArc Control Cables		See page 6		
Motor Extension Cables		See page 6		
Flux Hopper Extension Cables		See page 6		
SubArc Parallel Cable	260775015	15 ft. (4.6 m)		
SubArc Tandem Cable	260878015	15 ft. (4.6 m)		
SubArc Flux Hopper Digital Low Voltage	300942	25 lb. (11 kg) flux capacity		
Single-Wire Straightener	199733	For SubArc Wire Drive 400 Digital Low Voltage or 780 Digital Low Voltage		
Twin-Wire Straightener	301160	Single adjustment for twin-wire torches only		
	301162	Double/separate adjustment for twin-wire torches only		
Wire Reel	108008	For 60 lb. (27 kg) coil, requires Spool Support Assembly (119438)		
Spool Support Assembly	119438	Support for 60 lb. reels		
SubArc Single Mounting Bracket	301134			
SubArc Tandem Bracket	301135			
SubArc Mounting Hinge	301136			
Single Manual Slide	301137	7.87 in. (200 mm) travel adjustment		
SubArc Tractor		See page 7		
14-pin Insight Core™ Module	301072	Requires Insight Core™ to SubArc Digital Series Adapter (301295)		
ArcAgent™ Auto	301346	See literature WI/1.0 for more information		

Date:

Total Quoted Price:

Distributed by:

