Issued Nov. 2015 • Index No. AD/7.3

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 1000/1250: 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 AC/DC 1000/1250 Digital

SubArc DC 1000/1250 Digital

SubArc DC 650/800 Digital

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).

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™.

TRUE BLUE® 3YR. WARRANTY

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

Miller recommends

HOBART FILLER METALS

Miller®

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

ISO 9001 REGISTERED QUALITY SYSTEM

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.)

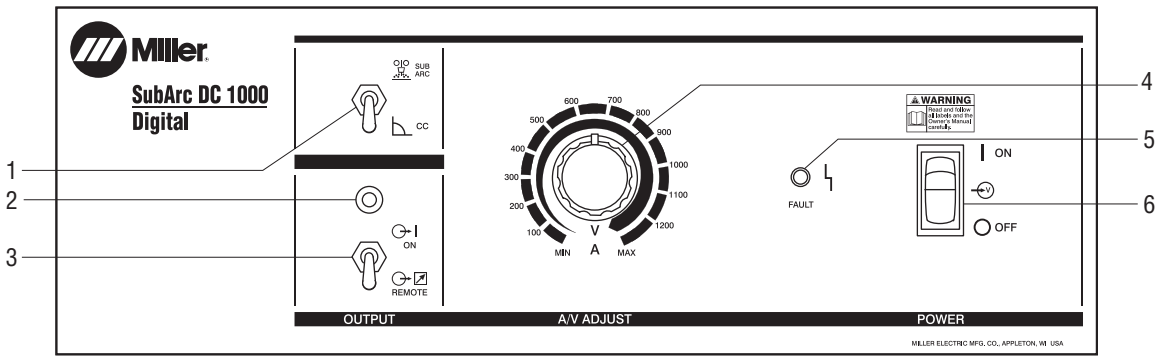
Model	Amperage/ Voltage Ranges	Rated Output	IP Rating	Amps Input at Rated Load Output, 60 Hz 230 V	460 V	575 V	Amps Input at Rated Load Output, 50 Hz 380 V	400 V	440 V	KVA	KW	Maximum Open-Circuit Voltage DC**	Dimensions	Net Weight
SubArc DC 650 Digital	50–815 A in CC mode	650 A at 44 V, 100% duty cycle	IP23	126 3.8*	63 1.9*	50.4 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 1.9*	90 1.8*	83 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 5.8*	90 2.9*	72 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 5.2*	128 5.0*	117 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 1000/1250 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.)

CC/CV AC/DC 3 Phase

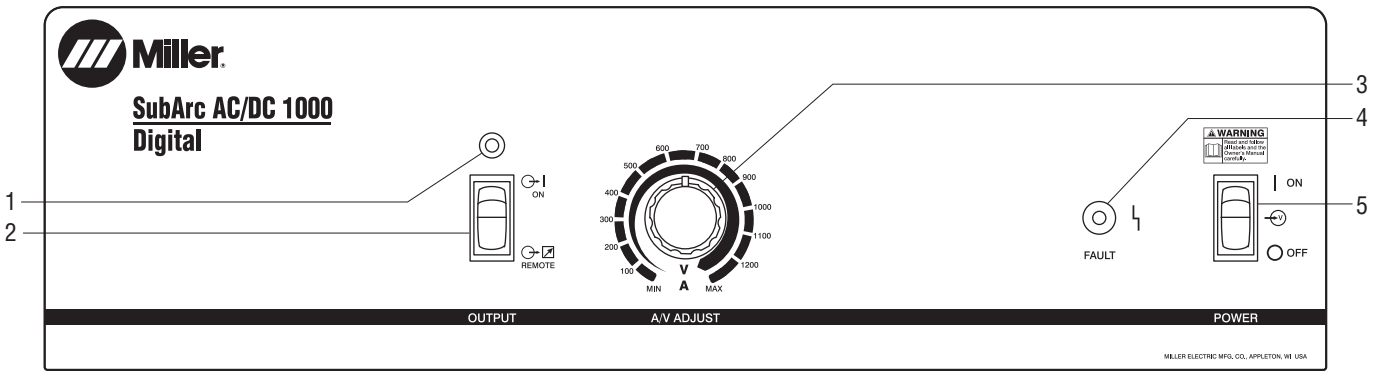
Model	Amperage/ Voltage Ranges	Rated Output	IP Rating	Amps Input at Rated Load Output 460 V (60 Hz)	380 V (50 Hz)	400 V (50 Hz)	KVA	KW	Maximum Open-Circuit Voltage DC	Dimensions	Net Weight
SubArc AC/DC 1000 Digital	300–1,250 A in CC mode 20–44 V in sub arc mode	1,000 A at 44 V, 100% duty cycle 1,250 A at 44 V, 60% 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				— —	179 3.0*	176 3.0*	122 2.37*	67 0.95*			1,260 lb. (572 kg)

**While idling.*

SubArc AC/DC 1000 Digital model 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.

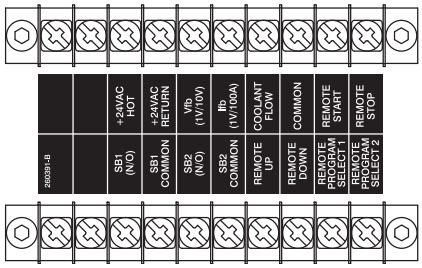
SubArc AC/DC Digital Control Panel



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

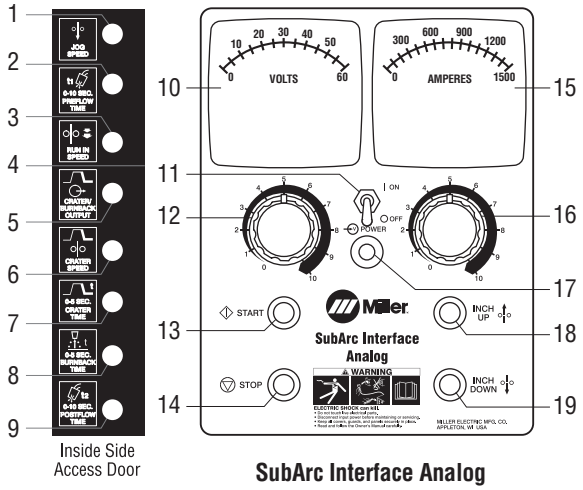
SubArc Interface Specifications (Subject to change without notice.)

Model	Input Power from Welding Power Source	Welding Power Source Type	Weld Voltage and Amperage Capacity	Dimensions	Net Weight
SubArc Interface Analog	Single-phase 24 VAC, 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: 7 in. (178 mm) W: 11.25 in. (286 mm) D: 11.5 in. (292 mm)	18 lb. (8.2 kg)
SubArc Interface Digital	Single-phase 24 VAC, 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		

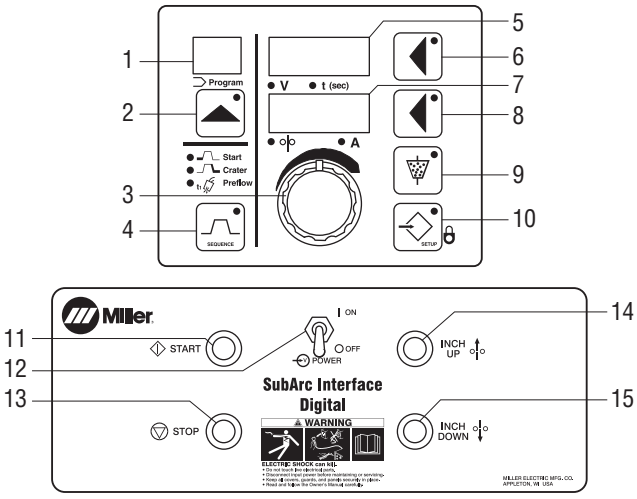
Certified by Canadian Standards Association to both the Canadian and U.S. Standards.

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

SubArc Interface Control Panels



SubArc Interface Analog



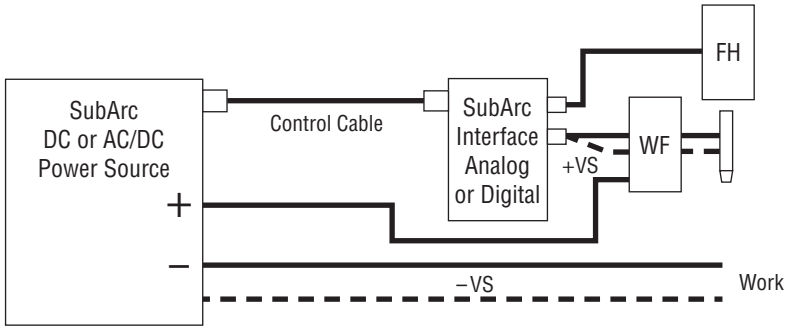
SubArc Interface Digital

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

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

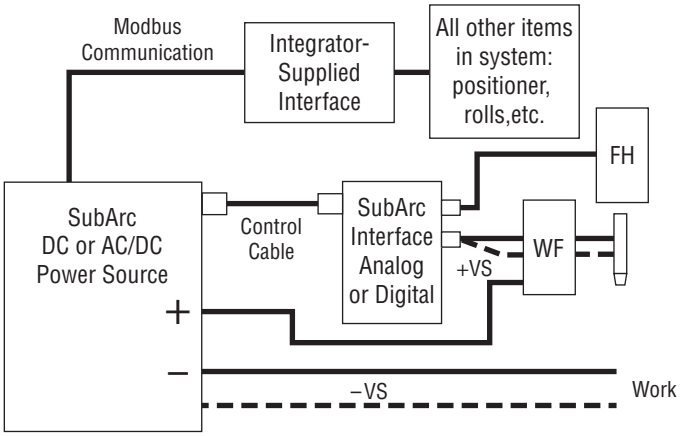
SubArc Interface Setup

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.



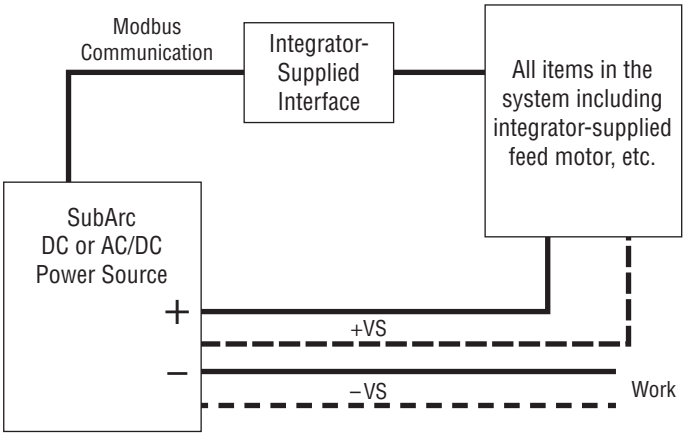
SubArc Modbus® Operation

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.

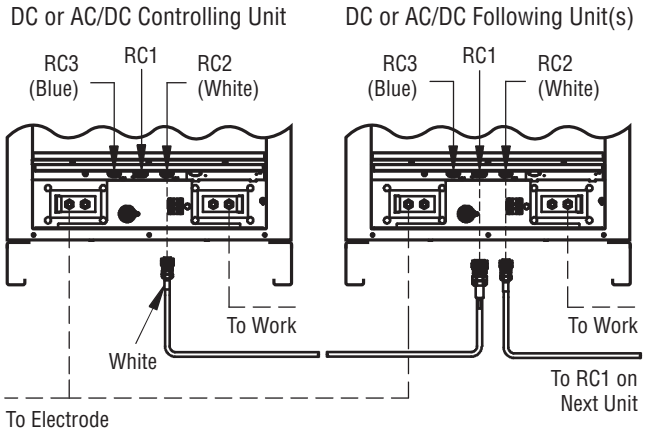
High-Level Method



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.

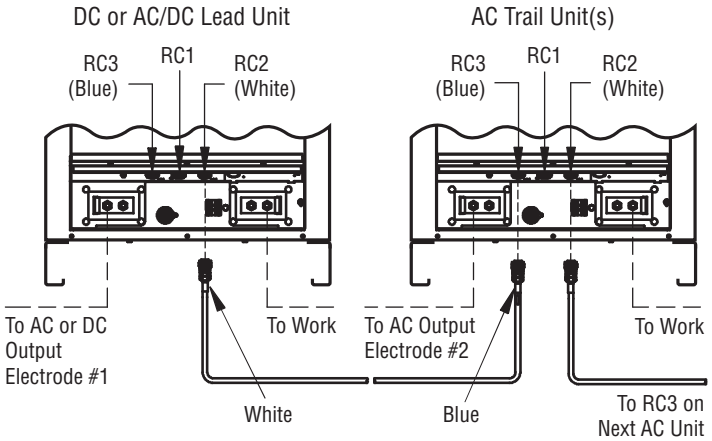
SubArc System Parallel and Tandem Setups

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
#300 939
#300 940* With mounting bracket

Heavy-duty, right-angle wire drive assembly designed for automated strip clad applications.

SubArc Wire Drive 400 Digital Low Voltage
#300 938* Standard speed
#300 938 001 Standard speed, for use with tractor

SubArc Wire Drive 780 Digital Low Voltage
#300 941* High speed

Right-angle wire drive assembly.

**Includes adapter plate allowing mounting to 2.5-, 4.25-, and 4.625-inch bolt-hole patterns.*

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)	33 lb. (15 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)	33 lb. (15 kg)

Accessories

Drive Rolls

#132 955 1/16 in. (1.6 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. (4.0 mm)
#193 701 3/16 in. (4.8 mm)

Cables

SubArc Control Cables
#260 622 030 30 ft. (9.1 m)
#260 622 050 50 ft. (15.2 m)
#260 622 080 80 ft. (24.4 m)
#260 622 100 100 ft. (30.5 m)
#260 622 120 120 ft. (36.6 m)
#260 622 200 200 ft. (61.0 m)
Cable between SubArc Interface and power source.

Motor Extension Cables
#254 232 005 5 ft. (1.5 m)
#254 232 010 10 ft. (3 m)
#254 232 025 25 ft. (7.6 m)
#254 232 065 65 ft. (19.8 m)
Cable between SubArc Interface and drive motor.

Flux Hopper Extension Cables
#260 623 010 10 ft. (3 m)
#260 623 025 25 ft. (7.6 m)
#260 623 065 65 ft. (19.8 m)
Cable between SubArc Interface and flux hopper.

SubArc Parallel Cable
#260 775 015
15 ft. (4.6 m)

SubArc Tandem Cable
#260 878 015
15 ft. (4.6 m)

Insight Core™ to SubArc Digital Series Adapter
#301 295

Accessories

Submerged Arc Torches

OBT 600 #043 923
600-amp, 100-percent-duty-cycle torch with concentric flux flow nozzle. Can be used with 1/16–3/16 inch (1.6–4.8 mm) wire.

OBT 600 Torch Body Extensions
#043 967 1 in. (25.4 mm)
#043 969 2 in. (50.8 mm)
#043 973 4 in. (101.6 mm)
#043 975 6 in. (152.4 mm)

OBT 1200 #043 900
1200-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 #043 981
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

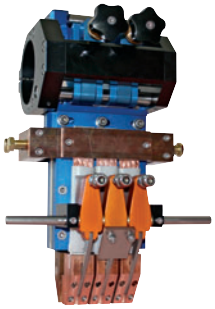
OBT 600	OBT 1200	Wire Size
#192 700	#192 141	1/16 in. (1.6 mm)
#192 701	#199 026	5/64 in. (2.0 mm)
#192 702	#192 142	3/32 in. (2.4 mm)
#192 703	#200 771	7/64 in. (2.8 mm)
#192 704	#192 143	1/8 in. (3.2 mm)
#192 705	#192 144	5/32 in. (4.0 mm)
#192 706	#192 136	3/16 in. (4.8 mm)

1,200-Amp Single-Wire Torch #301 141
Short, 11.3 inch (288 mm). 1,200-amp torch for 1/16–5/32 inch (1.6–4.0 mm) wires.

1,200-Amp Single-Wire Torch Contact Tips
#264 590 1/16 in. (1.6 mm)
#264 591 5/64 in. (2.0 mm)
#264 487 3/32 in. (2.4 mm)
#264 593 1/8 in. (3.2 mm)
#264 594 5/32 in. (4.0 mm)

1,200-Amp Twin-Wire Torches
#301 143 Short, 11.3 inch (288 mm)
#301 144 Long, 16.8 inch (427 mm)
1,200-amp torches for 3/64–3/32 inch (1.2–2.4 mm) wires.

1200-Amp Twin-Wire Torch Contact Tips
#264 595 3/64 in. (1.2 mm)
#264 596 1/16 in. (1.6 mm)
#264 597 5/64 in. (2.0 mm)
#264 588 3/32 in. (2.4 mm)



Internal and External Cladding Heads
Our range of external strip cladding heads are designed for both electroslag and submerged arc strip cladding. Strip size may vary from 1-3/16 to 4-3/4 inches (30 to 120 mm). The internal strip cladding heads are designed for submerged arc strip cladding. Strip size is standard 1-3/16 inch (30 mm).

Contact Miller for a full overview of welding torches and cladding heads.

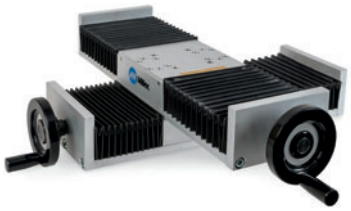
SubArc Flux Hopper Digital Low Voltage #300 942
Flux hopper with automatic flux valve will carry 25 pounds of flux. The opening is sized to allow hook-up of any flux-hopper-mounted recovery system. A slag screen is also provided. Includes 11-foot (3.3 m) power cord.

Single-Wire Straightener #199 733
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
#301 160 Single adjustment
#301 162 Double/separate adjustment
For twin-wire torches only.

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

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



Manual Slides
#301 137 Single slide, 7.87 in. (200 mm)
#301 138 Cross slide, 7.87 x 7.87 in (200 x 200 mm)
Manual cross slides for smooth and accurate movement of the welding heads. Single slide allows for 7.87 inch (200 mm) travel adjustment and cross slide allows for 7.87 x 7.87 inches (200 x 200 mm) with load capacity of 220 pounds (100 kg) at 1.64 feet (500 mm).
Not recommended for tandem.

SubArc Tractor
#300 945 Tractor only
#951 615 Analog weld control package
#951 614 Digital weld control p ackage
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 Lit. No. AD/7.5 for more information.

14-pin Insight Core™ Module #301 072
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 **(#301 295)**.

Ordering Information

Equipment and Options	Stock No.	Description	Qty.	Price
SubArc DC 650 Digital	**#907 622**	230/460/575 V, 60 Hz		
SubArc DC 800 Digital (50 Hz) CE	**#907 623**	380/400/440 V, 50 Hz		
SubArc DC 1000 Digital	**#907 624**	230/460/575 V, 60 Hz		
SubArc DC 1250 Digital (50 Hz) CE	**#907 625**	380/400/440 V, 50 Hz		
SubArc AC/DC 1000 Digital	**#907 620**	460 V, 60 Hz		
	#951 618	575 V, 60 Hz with 575 V to 460 V step-down transformer		
SubArc AC/DC 1250 Digital (50 Hz) CE	**#907 621**	380/400 V, 50 Hz		
Controls				
SubArc Interface Analog	**#300 937**	CC/CV, DC analog control		
SubArc Interface Digital	**#300 936**	CV, AC/DC digital control		
Drive Motors				
SubArc Strip Drive 100 Digital Low Voltage	**#300 939**	Heavy-duty, right-angle drive motor for automated strip clad applications		
	#300 940	Same as above with mounting bracket		
SubArc Wire Drive 400 Digital Low Voltage	**#300 938**	Standard-speed, right-angle drive assembly. Maximum speed 400 ipm (10 mpm)		
	#300 938 001	Same as above for use with Tractor		
SubArc Wire Drive 780 Digital Low Voltage	**#300 941**	High-speed, right-angle drive assembly. Maximum speed 780 ipm (19.8 mpm)		
Drive Rolls		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 in. (25.4 mm) 2 in. (50.8 mm) 4 in. (101.6 mm) 6 in. (152.4 mm)		
OBT 1200	**#043 900**	1,200 amp, 100% duty cycle, air cooled		
OBT 1200 Torch Body Extension	**#043 981**	9 in. (228.6 mm)		
1200-Amp Single-Wire Torches	**#301 141**	Short, 11.3 in. (288 mm), 1,200 amp		
1200-Amp Twin-Wire Torches	**#301 143** **#301 144**	Short, 11.3 in. (288 mm), 1,200 amp Long, 16.8 in. (427 mm), 1,200 amp		
Contact Tips		See page 7 for contact tips for all torches		
Internal and External Cladding Heads		Contact Miller		
Accessories				
SubArc Control Cables		See page 6		
Motor Extension Cables		See page 6		
Flux Hopper Extension Cables		See page 6		
SubArc Parallel Cable	**#260 775 015**	15 ft. (4.6 m)		
SubArc Tandem Cable	**#260 878 015**	15 ft. (4.6 m)		
SubArc Flux Hopper Digital Low Voltage	**#300 942**	25 lb. (11 kg) flux capacity		
Single-Wire Straightener	**#199 733**	For SubArc Wire Drive 400 Digital Low Voltage or 780 Digital Low Voltage		
Twin-Wire Straightener	**#301 160** **#301 162**	Single adjustment for twin-wire torches only Double/separate adjustment for twin-wire torches only		
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		
Single Manual Slide	**#301 137**	7.87 in. (200 mm) travel adjustment		
Manual Cross Slide	**#301 138**	7.87 x 7.87 in. (200 x 200 mm) travel adjustment		
SubArc Tractor		See page 7		
14-pin Insight Core™ Module	**#301 072**	Requires Insight Core™ to SubArc Digital Series Adapter **(#301 295)**		
Insight Core™ to SubArc Digital Series Adapter	**#301 295**			

Date: **Total Quoted Price:**

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The Power of Blue®

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