#### Issued Oct. 2016 • Index No. AU/10.0

# Auto-Continuum Systems Automated MIG Welding Systems



# Quick **Specs**

#### **Industrial Automation**

Construction equipment Automotive components Recreational vehicles Farm machinery Office furniture Mining machinery

#### **Processes**

Advanced MIG processes: Versa-Pulse" Accu-Pulse® MIG (GMAW-P) MIG (GMAW) High-deposition MIG (GMAW) Flux-cored (FCAW)

Input Power Auto-Line™ 230-575 V 3-phase, 50/60 Hz

### Rated Output at 104°F (40°C)

350: 350 A at 31.5 V, 100% duty cycle 500: 500 A at 39 V, 100% duty cycle

### **Output Range**

350: 20-400 A, 10-44 V 500: 20-600 A, 10-44 V

# Take your welding to the next level.

Next generation automation welding solution delivers advanced arc performance to improve throughput and weld quality.

The Auto-Continuum system features an adaptive arc with less spatter and improved gap handling, providing increased travel speeds and high-quality welds on a variety of base materials. Simple integration with fixed and flexible robotic systems.

# Insight

Integrated Welding Intelligence™ solutions. Delivers information to measure and improve your welding operation. See page 4 for more information.



wire drive motor assembly shown.



More power, better reliability



Better weld quality



Easy to set up and install for EtherNet/IP™, DeviceNet or Analog protocols



Easy to add capabilities



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



#### 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







# **Auto-Continuum™ System**

# More power. Better reliability.

For demanding industrial applications.



# All-new power source design

**Smart and powerful digital design** has the fast response needed to deliver the most stable welding performance for better welding results.

Developed as a platform to meet current and future needs with integrated expansion capabilities.

Produces more power at higher duty cycles and temperature ratings than competitive models.

- More power maximizes reliability in demanding automation applications by keeping all internal components operating cooler regardless of the jobs to be done.
- · More power ensures better welding results regardless of application or weld process.



More power, better reliability

Auto-Continuum 350: up to 26% more weld power
11,000 watts versus 8,700 watts = 2,300 watts more!
(Continuum: 350 A x 31.5 V at 100% duty cycle = 11,000 watts)
(Competitor: 300 A x 29 V at 100% duty cycle = 8,700 watts)

Auto-Continuum 500: up to 18% more weld power 19,500 watts versus 16,425 watts = 3,075 watts more! (Continuum: 500 A x 39 V at 100% duty cycle = 19,500 watts) (Competitor: 450 A x 36.5 V at 100% duty cycle = 16,425 watts)

# All-new wire drive motor assembly

**New low-inertia motor** provides faster response for the best arc starts with the least amount of spatter.

**Reduced-weight design** allows for quicker point-to-point arm movement and provides improved servo motor life.



Easy to set up and install

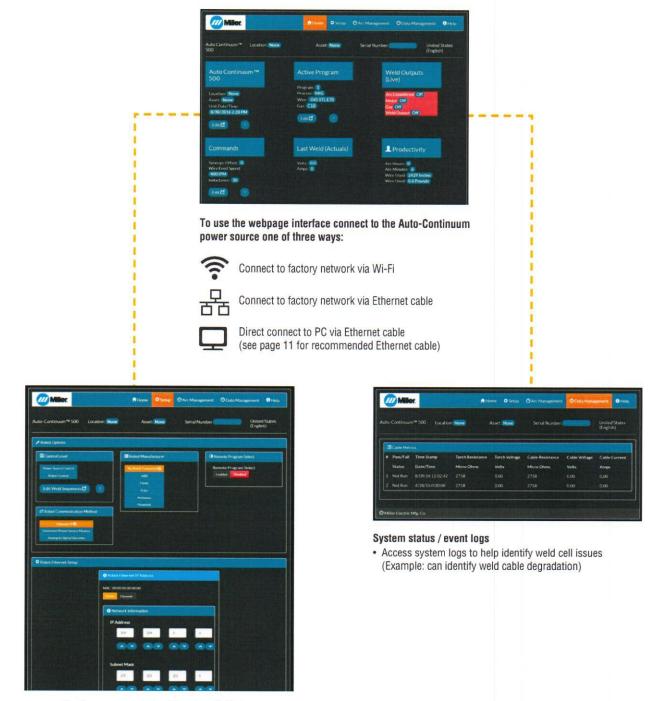
- Easy communication from robot and power source
- New wire drive motor assembly design utilizes common Miller mounting configurations
- Designed for easy integration with fixed and flexible automation systems
- Integrates with major industrial robot brands
- Simple retrofit to existing automation systems





# Webpages

Webpages are an easy way to initialize and configure your automation welding system.



Configure your robot settings to establish communication. Options include:

- EtherNet/IP™
- DeviceNet
- Analog



# **Insight Welding Intelligence™**

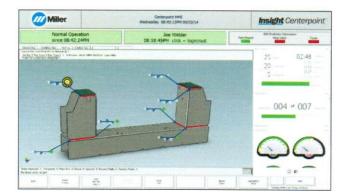
# Transform data into actionable information that drives continuous improvement. Learn more at MillerWelds.com/insight



# Insight Core (Standard)

Simplified, Internet-based welding information solution that reports cell productivity and weld parameter verification.

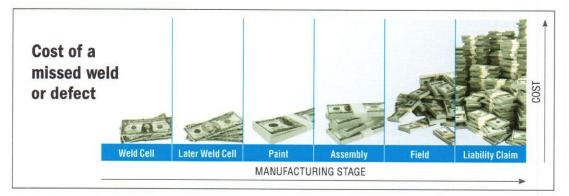
 Provides basic production metrics such as amps, volts, wire feed speed, arc on time and arc on time percentage



# **Insight** Centerpoint (Optional)

Advanced, real-time feedback solution to ensure consistent weld quality.

 With built-in features like Part Tracking™ to detect a bad weld and Insight Reporter for preconfigured reports and management charts, Insight Centerpoint can help reduce rework costs and improve quality.



Part Tracking actively detects a bad weld when it happens to reduce rework and improve quality.

- Detected weld errors due to poor parts fit-up, bent torch (due to colliding with a part), part loaded incorrectly, etc.
- Centerpoint will shut the system down either during or after the weld, to alert and direct the operator to which weld(s) are out of parameter, reducing inspection time
- Repair can be done at the weld cell before paint, which significantly reduces the cost of rework and improves overall parts quality

Overall Equipment Effectiveness (OEE) — Centerpoint can provide data on weld cell efficiency.

- · Robot on/off time
- · Open cell door time tracking
- · Duration of off time (due to parts shortage, fixture issue, etc)



# **Flexibility**



Easy to add capabilities

Fleet standardization. Auto-Continuum can be used for both automation and hand-held applications.

Note: To convert Auto-Continuum for manual weld applications, order feeder base (301431) and wire feeder drive (301216).

Adaptable to a variety of fixed and flexible automation configurations and requirements.

**Welding Intelligence:** Improve your welding operations by increasing productivity, improving quality and managing costs with Insight Core (standard) and Insight Centerpoint (optional) welding information management systems.

Easily add new processes and custom programs via the USB interface.

Parameter flexibility allows the system to be set for voltage and wire feed speed control, or for voltage and amperage control.



**Automation applications** 

**Hand-held applications** 



# **Auto-Continuum** System Processes

Each weld program is designed for specific wire and gas combinations — for optimized performance.

Low spatter levels at high travel speeds is a requirement in automated welding. The Versa-Pulse process precisely controls the welding arc, significantly reducing spatter size and quantity. Total spatter can significantly reduced over traditional processes.



Better weld quality

The adaptive arcs of Versa-Pulse™ and Accu-Pulse® instantly make adjustments to handle weld tacks, large gaps and inconsistent parts. The result is higher quality welds and fewer weld defects.

### NEW! Versa-Pulse

- Fast, low-heat, low-spatter process for high-speed automation on materials 1/4 inch (6.35 mm) and thinner
- · Great for gap filling
- Shortest arc length/lowest pulse voltage for lower heat and lower spatter at higher speeds

#### Accu-Pulse®

- · The most popular process for majority of industrial welding applications
- · Most adaptive arc on 16 gauge (1.6 mm) and thicker
- · Designed for all weld positions

### **RMD®**

- · Lowest heat process, best for gap handling
- · Limited travel speed

# **High-deposition MIG**

- · Higher deposition rates than standard spray transfer on thicker materials
- · Designed for welding applications in which spray transfer is preferred

### MIG (short circuit)

- · Lower spatter than traditional MIG welders
- · Better arc performance with silicon bronze and coated materials

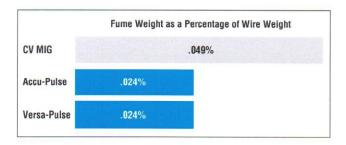
Best for	Standard Spray	High-Deposition MIG	Accu-Pulse	Versa-Pulse	MIG Short Circuit	RMD
Deposition	A	A	A	В	D	D
Gap Filing	D	D	В	В	A	A
Low Heat Input	D	С	В	A	A	A
Out-of-Position Welds			A	В	В	В
Low Spatter	А	A	A	A	С	В
Thick Metals	Α	А	A	С	D	D
Thin Metals			В	A	А	A
Increased Travel Speed	A	A	A	А	В	C
	нот					► COLD

Ratings A, B, C, and D are relative values. An "A" rating indicates a best fit between your performance needs and process. A "blank" rating indicates that the process is not recommended for that application.

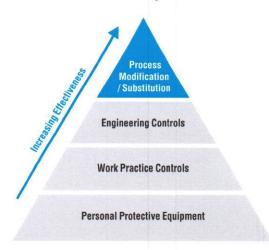


# **Weld Fume Control**

Modifying your welding processes to include Versa-Pulse and Accu-Pulse is an effective way of reducing fumes at the source. These processes reduce fume generation by up to 50 percent over traditional CV MIG.



# **OSHA** hierarchy of control



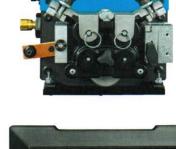
# **Auto-Continuum™ System Features**

Tru-Feed™ technology provides precise feeding operation for stable arc performance.

- · New low-inertia motor provides faster response for the best arc starts with the least amount of spatter.
- · Balanced-pressure drive-roll design and tensioners feed wire in its truest and straightest form for consistent feedability.

Spring-loaded Accu-Mate™ connection prevents the gun from being pulled loose.



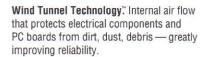




Quick-change dual-bearing drive rolls give you more consistent wire feeding.

Drive rolls and guides are common with other Miller industrial feeders (use existing, not new parts).

Inlet guide installation is toolless.



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





Auto-Line™ power management technology allows for any input

voltage hook-up (230-575 V) with no manual linking, providing convenience in any job setting. Eliminates weld defects caused by dirty or unreliable power.

Control display for easy reference of weld parameters.

Parameter flexibility allows the system to be set for voltage and wire feed speed control, or for voltage and amperage control.



# Auto-Continuum™ Specifications (Subject to change without notice.)



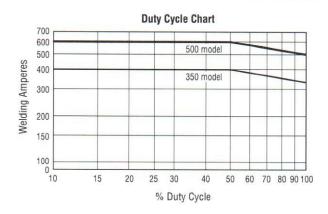




Model	Amp/Volt Ranges	Rated Output				Output, 460 V				Max. Open- Circuit Voltage	Dimensions	Net Weight
Auto-Continuum 350	20-400 A 10-44 V	350 A at 31.5 VDC, 100% duty cycle	36.7 0-1*	21.8 0-1*		18.8 0-1*	14.6 0-1*		13.8 0.17*	75 VDC	H: 27.19 in. (691 mm) (including lift eye)	130 lb. (59.4 kg)
Auto-Continuum 500	20-600 A 10-44 V	500 A at 39 VDC, 100% duty cycle	34.9 0-1*	_	33.2 0-1*	28.9 0-1*	23.3 0-1*	23.1 0.8*		75 VDC	W: 17.5 in. (444 mm) D: 28.22 in. (717 mm)	150 lb. (69 kg)

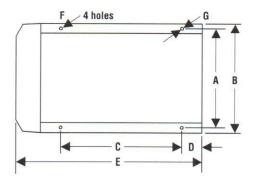
<sup>\*</sup>While idling.

# **Performance Data**



# **Mounting Specifications**

#### **Bottom View Power Source**

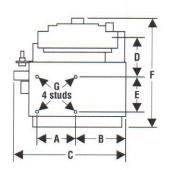


- A. 16.093 in. (409 mm)
- **B.** 17.5 in. (444 mm)
- **C.** 17.375 in. (441 mm)
- D. 2.281 in. (58 mm)
- E. 26.172 in. (665 mm)
- F. .468 in. (12 mm) dia.
- G. .468 in. x 1 in. (12 x 25 mm)

Height: 27.187 in. (691 mm) Width: 17.5 in. (444 mm)

Depth: 28.125 in. (714 mm)

### **Bottom View Wire Drive Motor**



- A. 3.5 in. (89 mm)
- B. 4.36 in. (111 mm)
- C. 10 in. (254 mm)
- D. 3.56 in. (101 mm) (distance from mounting studs to power pin hole)
- E. 3.25 in. (83 mm)
- F. 10 in. (254 mm)
- G. 1/4 in.-20 mounting studs

Height: 8.75 in. (222 mm) Width: 10 in. (254 mm)

Depth: 10 in. (254 mm)



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

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



Auto-Continuum™ Wire Drive Motor Assembly 301207 Left-hand drive 301208 Right-hand drive

Input Power	Welding Power Source	Input Welding Circuit Rating	Wire Feed Speed	Wire Diameter Capacity	Dimensions	Net Weight
50 VDC	Auto- Continuum 350 or 500	500 A at 100% duty cycle	<b>Standard</b> 50-1,000 ipm (1.27-25.4 m/min.)	(0.9-2.0 mm)	H: 8.75 in. (222 mm) W: 10 in. (254 mm) D: 10 in. (254 mm)	16.5 lb. (7.5 kg)

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

# **Drive Roll Kits and Guides** (Order from Miller Service Parts.)

Select drive roll kits from chart below according to type and wire size being used. Drive roll kits include four drive rolls, necessary guides and feature an anti-wear sleeve for inlet guide.

Wire Size	"V" groove for hard wire	"U" groove for soft wire or soft-shelled cored wires	"V" knurled for hard-shelled cored wires	"U" cogged for extremely soft wire or soft-shelled cored wires (i.e., hard facing types)	"U" groove for aluminum wires contains nylon guides
.035 in. (0.9 mm)	151026	_	151052	_	265255
.040 in. (1.0 mm)	161190	_	_	_	v <del>−</del> :
.045 in. (1.1/1.2 mm)	151027	151037*	151053	151070	265256*
.052 in. (1.3/1.4 mm)	151028	_	151054	_	_
1/16 in. (1.6 mm)	151029	151039	151055	151072	265257
.068/.072 in. (1.8 mm)	_	_	151056	_	_
5/64 in. (2.0 mm)	_	_	151057	-	_
3/32 in. (2.4 mm)	5 <u>—</u> )	151041	151058	_	x

<sup>\*</sup>Accommodates .045- and .047-inch (3/64-inch) wire.

### Nylon Wire Guides for Feeding Aluminum Wire

Wire Size	Inlet Guide	Intermediate Guide
.035 in. (0.9 mm)	221912	242417
.047 in. (1.2 mm)	221912	205936
1/16 in. (1.6 mm)	221912	205937

Note: "U" groove drive rolls are recommended when feeding aluminum wire.

# **Wire Guides**

Wire Size	Inlet Guide	Intermediate Guide
.023040 in. (0.6-1.0 mm)	221030	149518
.045052 in. (1.1-1.4 mm)	221030	149519
1/16-5/64 in. (1.6-2.0 mm)	221030	149520
3/32-7/64 in. (2.4-2.8 mm)	229919	149521



# **Genuine Miller® Accessories**

### **Consulting Services**

Field Application Support 195480

Auto-Continuum™ systems may require factory-trained technical support, depending on the complexity of the application and the local availability and capability of qualified welding engineers or technology experts. Contact the factory with questions. Factory support is available at a flat rate of \$1,250.00 per day (plus expenses) when scheduled more than 10 days in advance. With less than 10-day notice, rates may be higher. Rates are based on a 10-hour day, including travel. One day minimum.

### **Auto-Continuum with DeviceNet**

**DeviceNet Communication Cables 300020** 9 ft. (2.7 m)

**300021** 20 ft. (6.1 m)

Auto-Continuum Digital Peripheral Cable 301104 20 ft. (6.1 m)

### **Auto-Continuum Analog**

**Analog Receptacle Kits** 

194793 ABB®

194791 FANUC®

194790 Motoman®

300056 Panasonic®

195002 Universal

One required per machine. 12-inch (305 mm) length. For analog communication with robot controls via 72-pin Harting connector on Auto-Continuum.

**DeviceNet to Analog Adapter** 301427 Field Adapts DeviceNet to analog communication.

# Analog Robot Simulator 195030

Device simulates the analog commands of typical robots. It can be used as a diagnostic tool to determine power source functionality and isolate robot, power source or cable issues.

### **For All Auto-Continuum Models**



ADAM DI/O Module 300803
Provides a digital I/O interface for communication between a robot /PLC and Auto-Continuum power supply. The interface allows for the interaction of a robot or PLC and the Insight Centerpoint™ application. This module is required for all

DeviceNet and analog Auto-Continuum models to run Insight Centerpoint.

Continuum Sourcing I/O Kit 301150

#### Wire Drive Motor Mounting Brackets

300013 Universal - FANUC®/KUKA®/Motoman®

**301276** ABB® 1600

301277 ABB® 2600

300483 FANUC® 100 and 120 IC

301282 KUKA® KR5 HW

301275 KUKA® KR16 HW

300375 Motoman® EA1400

300376 Motoman® EA1900

#### **Welding Guns**

Manual — see BernardWelds.com Automation — see Tregaskiss.com

#### **Motor Control Cables**

263368025 25 ft. (7.6 m)

263368050 50 ft. (15.2 m)

**263368080** 80 ft. (24.4 m)

263368100 100 ft. (30.5 m)

Includes overmolded connections on high-flex cables for optimal service life.

#### Volt-Sense Cable 242212050

Replacement 50 ft. (15.2 m) cable. One cable supplied with Auto-Continuum power source.

#### **Ethernet Cables**

300734 9.8 ft. (3 m)

300735 16.4 ft. (5 m)

300736 32.8 ft. (10 m)

Industrial-grade 360-degree-shielded Cat 5
Ethernet cable with conventional RJ45
overmolded four-pole connector on one end to connect to factory network, and industrial M12 overmolded connector on the other end to attach to Auto-Continuum power source.
Cable supports 10/100 Mbits-per-second transmission rate.



Auto-Continuum Robotic MIG Kit 301422 Includes Auto-Continuum wire drive motor assembly (left-hand drive), flowmeter regulator with 50-foot (15.2 m) gas hose, two 50-foot (15.2 m) 4/0 weld cables with lugs, one motor control cable, one 16.4-foot (5 m) Ethernet cable, .035/.045-inch V-groove drive roll kit with four drive rolls and necessary guides, and 30-foot (9 m) conduit assembly with quick disconnects.

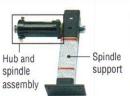
#### Continuum Feeder Base and Spool Support 301431

Sheet metal construction. Allows mounting of Auto-Continuum wire drive motor for manual welding operations.

### Wire Feeder Drive (Left) 301216

Use with feeder base and spool support when converting to a manual weld system.





Hub and Spindle Assembly 072094

Spindle Support 092989



Spool Cover 057607



Wire Reel Assembly 108008

#### Reel Cover 195412

For 60-pound (27 kg) coil. Helps to protect the welding wire from dust and other contaminants.



Wire Straightener 141580 For .035 –.045 in. (0.9 – 1.1 mm) wire. 141581 For 1/16 – 1/8 in. (1.6 – 3.2 mm) wire.

Helps reduce the cast in wire to improve wire feeding performance and increase the service life of the gun liner and contact tip.

### **Coolant Systems**



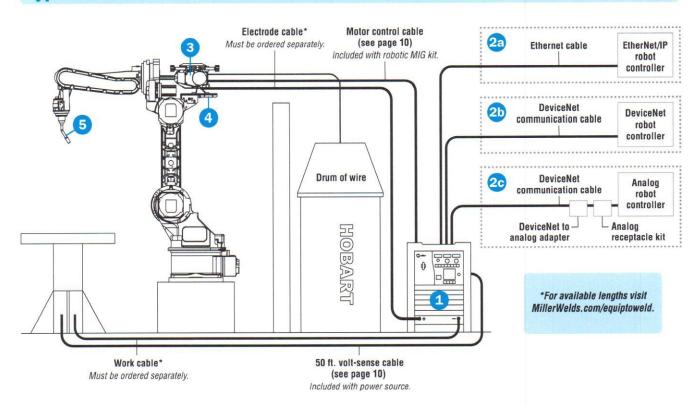
#### Continuum Cooler 301214

For use with water-cooled torches rated up to 500 amps. Integrated coolant flow switch ensures coolant is flowing in the system. The Continuum cooler mounts to the bottom of the Continuum power source. Power is supplied via an internal connection with the power source.

#### Low-Conductivity Coolant 043810

Sold in cases of four one-gallon recyclable plastic bottles. Miller coolants contain a base of ethylene glycol and deionized water to protect against freezing to -37 degrees Fahrenheit (-38°C) or boiling to 227 degrees Fahrenheit (108°C). Also contains a compound that resists algae growth.

# Typical Installations (Robotic/automation pulsed MIG or conventional MIG.)



### Power Source

See page 12 for available models. Choose power source according to preferred communication protocol. Each power source includes a 50-foot (15.2 m) volt-sense cable.

### Robot Controller Connection (choose one)

- a EtherNet/IP<sup>™</sup> Requires Ethernet cable. 16.4-foot (5 m) cable included with Auto-Continuum robotic MIG kit. See page 10 for individual cables.
- DeviceNet Requires DeviceNet communication cable. See page 10 for available cable lengths.
- C Analog Requires DeviceNet communication cable. See page 10 for available cable lengths. Also requires DeviceNet to analog adapter (301427) and analog receptacle kit (see page 10).

### 3 Auto-Continuum Robotic MIG Kit

Includes wire drive assembly and all cables, hoses and hardware for outfitting a robot arm. See description at right for details.

# 4 Motor Mounting Bracket

See page 10 for available brackets. Motor mounting brackets from other brands must be supplied by robot manufacturer or system integrator.

### 🕟 Tregaskiss Robotic MIG Gun

Must be ordered separately. Visit Tregaskiss.com for additional torch information.



## Auto-Continuum Robotic MIG Kit 301422

Kit includes the following:

- · Auto-Continuum wire drive motor assembly (left-hand drive)
- Flowmeter regulator with 50-foot (15.2 m) gas hose
- Two 50-foot (15.2 m) 4/0 weld cables with lugs
- · One motor control cable
- One 16.4-foot (5 m) Ethernet cable
- .035/.045-inch V-groove drive roll kit with four drive rolls and necessary guides
- 30-foot (9 m) conduit assembly with quick disconnects



# **Ordering Information**

Note: As the technological advances offered by Auto-Continuum extend beyond the capability of Auto-Axcess™ systems, the two systems are not compatible. Auto-Continuum systems are designed to allow future upgradability, to expand with your operation's needs.

Equip	ment and Options		Stock No.	Description	Qty.	Price
A	Power Source					
9	Auto-Continuum 350	For EtherNet/IP™	907656 907658	With EtherNet/IP communication With EtherNet/IP communication and auxiliary power		
	Auto-Continuum 500	Robot Controller	907657 907659	With EtherNet/IP communication With EtherNet/IP communication and auxiliary power		
	Auto-Continuum 350	For DeviceNet	907656001 907658001	With DeviceNet communication With DeviceNet communication and auxiliary power		
	Auto-Continuum 500	or Analog Robot Controller	907657001 907659001	With DeviceNet communication With DeviceNet communication and auxiliary power		
obo	t Controller Connection					
Robot Controller Ethernet Cables		300734 300735 300736	9.8 ft. (3 m) 16.4 ft. (5 m) 32.8 ft. (10 m)			
<b>2</b> b	Robot Controller DeviceNet Communicat	ion Cables	300020 300021	9 ft. (2.7 m) 20 ft. (6.1 m)		
2c	Robot Controller DeviceNet Communicat	tion Cables	300020 300021	9 ft. (2.7 m) 20 ft. (6.1 m)		
	DeviceNet to Analog Ad	lapter	301427	Field-installed option. Adapts DeviceNet to analog communication		
	Analog Receptacle Kit (one required per mach	nine)	194793 194791 194790 300056 195002	ABB® analog communication FANUC® analog communication Motoman® analog communication Panasonic® analog communication Universal analog communication		
/ire	Drive Motor Assemblie	es and Accessories				
3 Auto-Continuum Robotic MIG Kit			301422	Includes wire drive motor assembly, flowmeter regulator with gas hose, cables, drive roll kit and conduit assembly. See page 11 for complete list		
4 Wire Drive Motor Mounting Brackets		300013 301276 301277 300483 301282 301275 300375 300376	Universal — fits FANUC®/KUKA®/Motoman® ABB® 1600 ABB® 2800 FANUC® 100 and 120 IC KUKA® KR5 HW KUKA® KR16 HW Motoman® EA1400 Motoman® EA1900			
5	Tregaskiss™ Robotic M and Consumables	IIG Guns, Peripherals		Order separately. Visit Tregaskiss.com for models and information on TOUGH GUN™ robotic MIG guns, TOUGH GUN™ reamers, QUICK LOAD™ liners and TOUGH LOCK™ consumables		
Veld	ing Intelligence™ Softwa	are				
nsigl	nt Centerpoint™ Package		301297 301322	Standard capability pack (1 per power source) Advanced capability pack (1 per power source)		
nsigl	nt Centerpoint™ License		301255 301256	Version 9.0 single license Version 9.0 site license		
	nt Reporter <sup>™</sup> Software		300709	Management reporting system client software	1	
nsigh	nt Reporter™ SQL Databa	se	300710	Management reporting system database software (one required per server)		-
	ssories				-	
Continuum Cooler		301214	Integrated 2-gallon capacity cooler for water-cooled MIG guns		-	
	Conductivity Coolant		043810	1-gallon plastic bottle (must be ordered in quantities of 4)		
	Continuum Wire Drive N		301207 301208	Left-hand drive (included in the Auto-Continuum robotic MIG kit) Right-hand drive		
Conti	nuum Feeder Base and S	Spool Support	301431	Includes 3-foot motor control cable (connects to power source)		
Nire	Feeder Drive (Left)		301216	For use with feeder base and spool support when converting to a manual weld system		

Date:

Total Quoted Price:

Distributed by:

