

Invertec® V311-T AC/DC

Processes

Stick, TIG

Product Number

K2915-1 Invertec® V311-T AC/DC Base Unit

K2916-1 Invertec® V311-T AC/DC One-Pak®

See back for complete specs

Input Voltage

208/230/380/400/460/1/3/50/60

Input Current at Rated Output

See Back For Specs

Rated Output

See Back For Specs

Output Range

5 - 310A

Weight/Dimensions (H x W x D)

75 lbs. (34 kg)

17.3 x 10.6 x 24 in

(439 x 269 x 609 mm)

Premium Arc Performance. Rugged and Reliable. Portable and Efficient.

The Invertec® V311-T AC/DC is both technologically advanced and ruggedly constructed and tested for use in almost any production or fabrication environment, including tough shipbuilding applications.

FEATURES

- ▶ **Premium TIG Performance**
 - Adjustable AC Frequency – Focus the arc cone for precise control.
 - Expanded AC Balance – Minimizes tungsten erosion and etching surrounding the weld.
 - Selectable Half Wave Shapes – Independently select the positive and negative portions of the AC wave shapes from Sine, Square, or Triangular wave types to deliver the arc characteristics you require.
- ▶ **Complete Control** - Dial in your weld.
 - 16 user-adjustable welding parameters.
 - Set-up menu provides access to less frequently used parameters.
 - 10 user memories to recall ideal settings for repeating welds.
- ▶ **Intuitive LCD Control Panel** - Shows you exactly what's happening with your weld as you change settings. High contrast display is viewable even in sunlight.
- ▶ **Add a Cool Arc® 35 Smart Water Cooler** - Automatically monitors pressure and temperature and adjusts the pump speed to cool the torch.
- ▶ **Focused Stick Performance** -
 - Crisp Mode for AWS E6010 electrodes
 - Soft Mode for AWS E7018 electrodes
 - AC Stick Mode for AC operation

WHAT'S INCLUDED

K2916-1 One-Pak® Includes:

- ▶ K2915-1 Invertec® V311-T AC/DC
- ▶ K2630-1 Cool Arc® 35 Water Cooler
- ▶ K2694-1 Inverter Cart
- ▶ K2267-1 TIG Mate™ 20 Torch Kit
- ▶ K870 Foot Amptrol®
- ▶ K918-1 Zippered Cable Cover



K2916-1 One-Pak® shown assembled.

FEATURES, CONT'D

- ▶ **Efficient Electrical Conversion** – The inverter platform consumes nearly 20% less power, compared to conventional TIG welders, to lower your energy costs.
- ▶ **Auto-Reconnect** - Power up on almost any industrial input voltage, including 208/230/380/400/460V single or three phase, 50 or 60 hertz.
- ▶ **Lightweight and Portable** – At 75 lbs and with a compact footprint, this multiple input voltage welder is ideal for TIG welding in shipbuilding.
- ▶ **Extreme Life Testing** – Extended environmental and life testing delivers long service life.

INPUT



OUTPUT



Two Year Extended Warranty Available.

APPLICATIONS

- ▶ Motorsports
- ▶ Aerospace
- ▶ Shipbuilding
- ▶ Construction
- ▶ Fabrication



THE LINCOLN ELECTRIC COMPANY

KEY CONTROLS



1. Status LED Lights
2. LED Display
3. Dynamic LCD Display
4. Memory Save/Recall Controls
5. Weld Mode
6. Trigger Mode
7. TIG Pulse Mode
8. Memory Location Select
9. Push Button/Rotary Encoder
10. Gas Hose Fitting
11. Power Cable Connection
12. On/Off Power Switch



INTUITIVE CONTROL PANEL

- Bright display
- Preset parameters are visible at a glance
- Logically organized controls
- Select and adjust the highlighted active parameter
- 16 user adjustable welding parameters
- 10 memories save frequently used settings



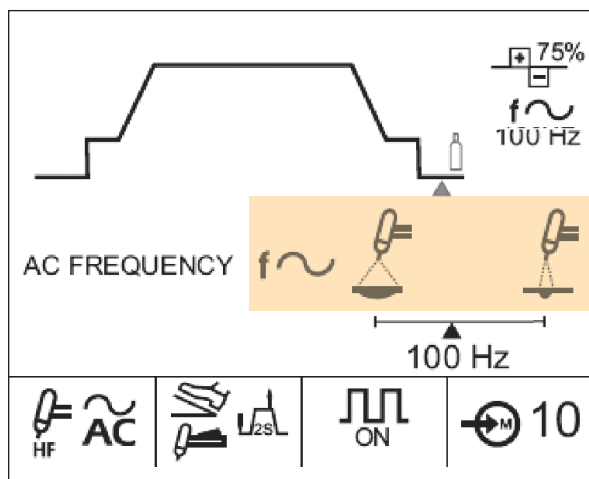
PROCESS SPECIFIC DISPLAY

- Shows only the parameters relevant to the selected process.

	STICK MODE	BASIC TIG MODE	PULSE TIG MODE
Weld Sequence Display			
Active Parameter Display	Max. Current 130A	Max. Current 28A	Max. Current 250A
Mode Status Display	DC 1	DC OFF 1	AC ON 1
	Weld Mode (Stick)	Weld Mode (DC TIG)	Weld Mode (AC TIG)
	Local/Remote Mode	Trigger Mode	Trigger Mode
	Pulse Mode (Not Applicable)	Pulse Mode (Off)	Pulse Mode (On)
	Memory Location	Memory Location	Memory Location

DYNAMIC DISPLAY™ ICONS

- The relevant portion of each icon changes size or shape in real time as you adjust parameter values.
- Simplifies complicated parameters by showing the effect on the arc and the weld.



DYNAMIC PARAMETERS	DYNAMIC SYMBOLS	
	Minimum	Maximum
AC FREQUENCY		
AC BALANCE		
PULSE FREQUENCY		
HOT START		
ARC FORCE		

SET-UP MENU

Hides Less Frequently Adjusted Parameters

- Select strike current for different tungsten electrode sizes.
- Select start power for AC TIG starting.
- Enable additional trigger modes like spot time, or bi-level amperage control.
- Display settings.
- Language settings.

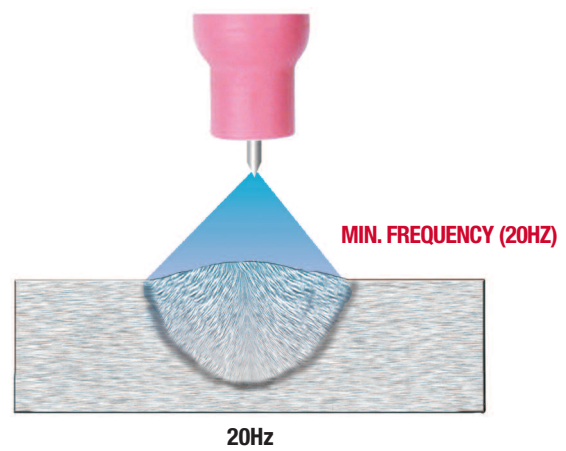
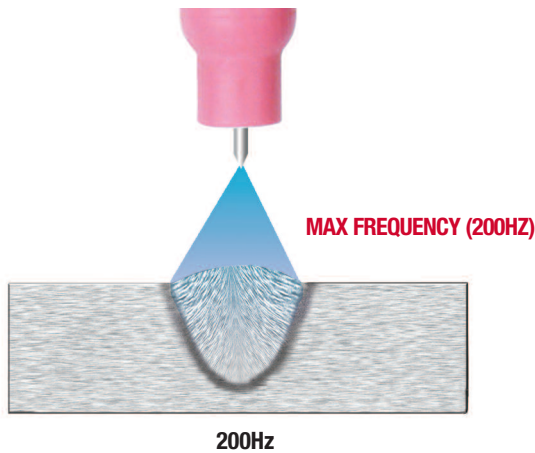
Customize Your Machine

- Select your language:
 - English
 - Spanish
 - French

Adjustable AC Output Frequency

Higher Frequency narrows or focuses the arc cone, allowing precise control of arc and access into tight joints.

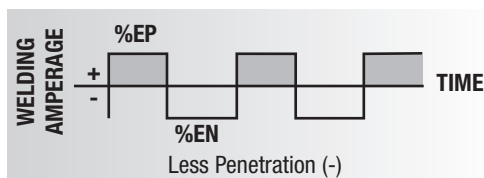
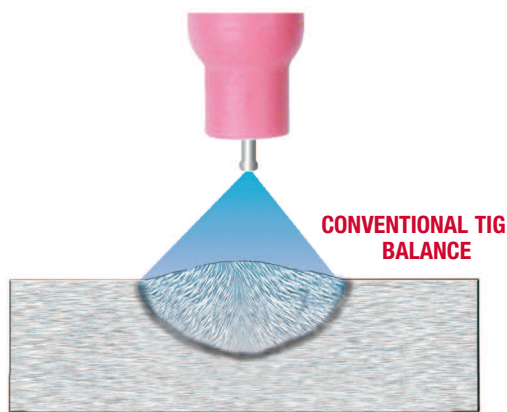
Lower Frequency widens the arc cone, minimizing agitation of base metal.



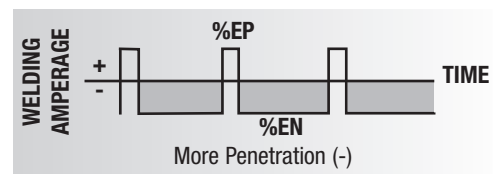
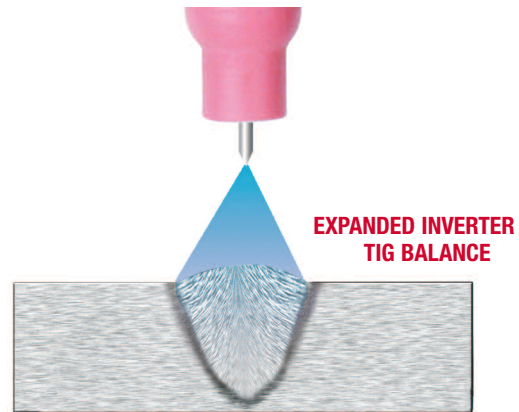
Expanded AC Balance

Inverters can be set to a higher ratio of Electrode Negative (%EN) to electrode positive (%EP) for:

- Increased control over cleaning action.
- Better penetration with narrow bead profile.
- Minimized tungsten erosion (keep a sharp point).
- Minimize etching adjacent to the weld.



Electrode Positive (%EP) = Cleaning + Tungsten Heating

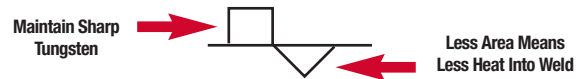


Electrode Negative (%EN) = Penetration

Selectable Wave Type and Half Wave Shapes

With the Invertec® V311-T AC/DC, not only can you choose Sine, Square or Triangular AC wave types, but you can also independently assign one of those wave types to the positive and negative portions of the wave shape.

Here's an example: You can assign a square wave to the positive half of the wave shape to minimize high peak currents that can erode the tungsten. Independently, you can assign a triangular wave type to the negative portion of the wave shape to minimize heat input to the weld.



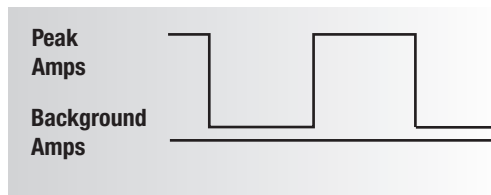
Selectable AC Wave Shapes

Wave Type	Description	Result
Square 	Responsive arc with fast zero crosses and reduced peak amperages	Stable arc with good puddle control and fast travel speed Minimizes tungsten superheating
Sine 	Traditional smooth shaped waveform	Soft sounding arc
Triangular 	Minimized area (heat) under the curve shape with high peaks	Lower amperages can minimize heat input to the weld High peaks more forceful for anodized applications

High Speed DC TIG Pulsing

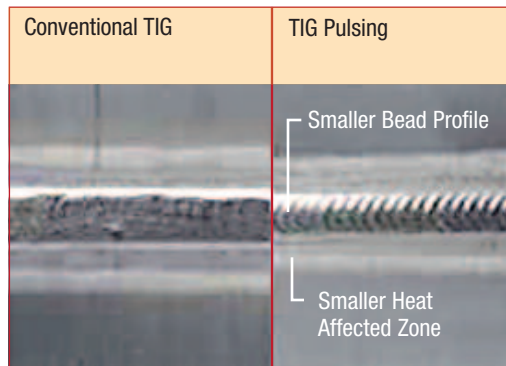
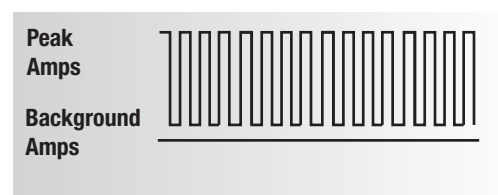
Conventional TIG Pulsing (<10 pulses per second)

- Timed filler metal and consistent bead appearance.
- Reduces heat input by alternating between peak current and background to minimizes distortion.

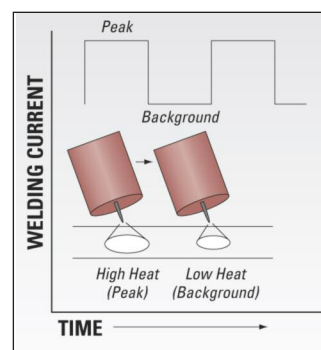


High Speed TIG Pulsing (Up to 2500 pulses per second)

- Increased puddle agitation for improved weld microstructure
- Focused stable arc.
- Increased travel speeds.
- Reduced heat input.



PULSE FREQUENCY: Number of Pulses Per Second



WHY UPGRADE TO INVERTER TECHNOLOGY?

Advantages

- More Portability
- Lighter Weight
- Less Space
- Auto Reconnect
- Simplified Installation
- Lower Operating Costs and Infrastructure
- Lower Power Consumption
- Higher Power Factor
- Lower Current Draw

Less High Frequency

- Patented Super Imposition Circuit provides an energy pulse to keep the arc lit during Zero Cross.
- High Frequency is required only to start the arc.
- Results in lower radiated Interference.
- No High Frequency etching for better quality welds.



Floor Space (sq. in)	Size (cu. in)	Weight (lbs.)	Input Power (kW, @250A, 30V output)
<div>270</div> <div>303</div> <div>572</div>	<div>4582</div> <div>7487</div> <div>17732</div>	<div>75</div> <div>135</div> <div>397</div>	<div>9.6</div> <div>9.9</div> <div>11.8</div>
Lincoln Electric Inverter® V311-T AC/DC Miller Electric® Dynasty® 350 Lincoln Electric Precision TIG® 275	Lincoln Electric Inverter® V311-T AC/DC Miller Electric® Dynasty® 350 Lincoln Electric Precision TIG® 275	Lincoln Electric Inverter® V311-T AC/DC Miller Electric® Dynasty® 350 Lincoln Electric Precision TIG® 275	Lincoln Electric Inverter® V311-T AC/DC Miller Electric® Dynasty® 350 Lincoln Electric Precision TIG® 275
<ul style="list-style-type: none"> • 50% less than a conventional TIG machine • 11% less than a Dynasty® 350 	<ul style="list-style-type: none"> • 75% smaller than a conventional TIG machine • 40% smaller than a Dynasty® 350 	<ul style="list-style-type: none"> • 80% lighter than a conventional TIG machine • Over 40% lighter than the Dynasty® 350 	<ul style="list-style-type: none"> • Higher efficiency inverter consumes nearly 20% less input power for lower energy costs.

* Miller Electric data based on published literature. Miller Electric® and Dynasty® are not registered trademarks of the Lincoln Electric Company.

RECOMMENDED ACCESSORIES TO EXPAND MACHINE CAPABILITIES



GENERAL OPTIONS

Inverter Cart

Conveniently holds the Cool Arc® 35 and Invertec® V311-T AC/DC power source. Features a tool storage tray for convenience and a cylinder platform to hold a gas bottle.

Order K2694-1



STICK OPTIONS

Remote Output Control

For stick welding. Portable current control provides the same range as the current control on the welder. Features a 6-pin connector and a 25 ft (7.6 m) cable length.

Order K857

TIG OPTIONS

Foot Amptrol™

For TIG welding. Remotely energizes the output and controls the output. Connects directly to the 6-pin remote control connector.

Order K870

Hand Amptrol™

For TIG welding. Remotely energizes the output and controls the output. Connects directly to the 6-pin remote control connector.

Order K963-3

Arc Start Switch

Energizes the output for TIG welding if remote output control of the amperage is not desired. Allows on/off TIG welding at the amperage set by the Current Control on the control panel. When using the Arc Start Switch set the Output Control to the "LOCAL" position.

Order K814

Cool Arc® 35 Water Cooler

Attaches underneath and electrically connects to the Invertec® V311-T AC/DC. This smart cooler varies its speed based on coolant temperature and monitors coolant pressure.

Order K2630-1



Twist Mate® Cable Plug Kit

For connecting welding cable to output terminal receptacles for 1/0 - 2/0 (50 - 70 mm²) cable.

Order K852-70



Twist Mate® Torch Adapter PTA-9 & 17

Adapter for PTA-9 or PTA-17 TIG torches with one-piece cable. The quick connect plug provides connection for both gas and welding current.

Order K1622-1



Twist Mate® Torch Adapter PTA-26

Adapter for PTA-26 TIG torches with one-piece cable. The quick connect plug provides connection for both gas and welding current.

Order K1622-3



Twist Mate® Torch Adapter (Water-Cooled)

Adapter for PTW-18 and -20 Torches.

Order K1622-4



TIG-Mate™ 17 TIG Torch Starter Kit (Air-Cooled)

One complete easy-to-order kit packaged in its own portable carrying case. Includes: PTA-17 torch, parts kit, Harris® flowmeter/regulator, 10 ft (3 m) gas hose, Twist Mate® adapter, work clamp and 10 ft (3 m) cable.

Order K2266-1



TIG-Mate™ 20 TIG Torch Starter Kit (Water-Cooled)

One complete easy-to-order kit packaged in its own portable carrying case. Includes: PTW-20 torch, parts kit, Harris® flowmeter/regulator, 10 ft (3 m) gas hose, Twist Mate® adapter, work clamp and 10 ft (3 m) cable, and 10 ft (3 m) water hose.

Order K2267-1



Magnum® Pro-Torch® TIG Torches

The following standard Magnum® TIG torches may be used with the Invertec® V311-T AC/DC. Consult Publication E12.150 for other torches.

K1781-1 PTA-9 12.5 ft. (3.8 m)

Air-Cooled 125A

K1781-3 PTA-9 25 ft. (7.6 m) Air-Cooled 125A

K1782-1 PTA-17 12.5 ft. (3.8 m) Air-Cooled 150A

K1782-3 PTA-17 25 ft. (7.6 m) Air-Cooled 150A

K1783-1 PTA-26 12.5 ft. (3.8 m) Air-Cooled 200A

K1783-3 PTA-26 25 ft. (7.6 m) Air-Cooled 200A

K1784-3 PTW-20 12.5 ft. (3.8 m) Water-Cooled 250A

K1784-4 PTW-20 25 ft. (7.6 m) Water-Cooled 250A

K1784-1 PTW-18 12.5 ft. (3.8 m) Water-Cooled 350A

K1784-2 PTW-18 25 ft. (7.6 m) Water-Cooled 350A

NOTE: Each torch requires a Twist Mate® adapter, collet, collet bodies, and nozzles. Each is not included and must be separately ordered.

TIG Torch Parts Kits

Parts kits are available for Lincoln Electric Pro-Torch® TIG torches.

These kits include back cap, collets, collet bodies, nozzles and tungstens.

Order **KP507** for PTA-9 torches

Order **KP508** for PTA-17 torches

Order **KP509** for PTA-26 & PTW-18 torches

Order **KP510** for PTW-20

Water-cooled torches

Order **KP2414-1** Gas Lens Parts kit for PTA-9 torches

See publication E12.150 for parts kits breakdown.



Cut Length Consumables

TIG welding filler metals are available for welding stainless steel, mild steel, aluminum and copper alloys. See publication C9.10.



PRODUCT SPECIFICATIONS

Product Name	Product Number	Phase	Input Power Voltage/Hertz	Rated Output Current/Voltage/Duty Cycle	Input Current @ Rated Output	Output Range	H x W x D inches (mm)	Net Weight lbs. (kg)
Invertec® V311-T AC/DC Invertec® V311-T AC/DC One-Pak®	K2915-1	3-Phase	460/50/60	210A / 18.4V / 100% 230A / 19.2V / 60% 310A / 22.4V / 40%	7.3 8.3 12.3	5-310A MAX. OCV: 80V	17.3 x 10.6 x 24 (439 x 269 x 609)	75 (34)
	K2916-1		230/50/60	210A / 18.4V / 100% 230A / 19.2V / 60% 310A / 22.4V / 30%	13.6 15.8 24.6			
			208/50/60	210A / 18.4V / 100% 230A / 19.2V / 60% 310A / 22.4V / 30%	15.3 17.5 27.3			
		1-Phase	460/50/60	200A / 18.0V / 100% 220A / 18.8V / 60% 310A / 22.4V / 35%	13.6 14.9 23.1			
			230/50/60	200A / 18.0V / 100% 220A / 18.8V / 60% 310A / 22.4V / 25%	21.9 24.6 41.5			
			208/50/60	200A / 18.0V / 100% 220A / 18.8V / 60% 310A / 22.4V / 25%	24.2 27.7 47.3			

For best welding results with Lincoln Electric equipment, always use Lincoln Electric consumables.
Visit www.lincolnelectric.com for more details.

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or advice about their use of our products. Our employees respond to inquiries to the best of their ability based on information provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or advice. Moreover, the provision of such information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose is specifically disclaimed.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

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LINCOLN®
ELECTRIC
THE WELDING EXPERTS®