

# Invertec® STT® II

## Processes

GMAW-STT®

## Product Number

K1525-1 208/230/460/3/60  
 K1526-1 200-208/220-230/380-415/440-460/3/50/60  
 K1526-2 200/208/380/400/415/3/50/60  
 K1527-1 200/220/380/415/440/3/50/60  
 K1527-2 200/208/380/400/415/3/50/60  
 K1560-2 STT®-10 Wire Feeder

## Input Power

208/230/460/3/60

## Input Current at Rated Output

32/30/16A

## Rated Output Current/Voltage/Duty Cycle

225A/29V/60%

## Output Range

Peak Current: 0-450A

## Weight/Dimensions (H x W x D)

117 lbs. (53 kg)

23.2 x 13.2 x 24.4 in.

(589 x 336 x 620 mm)

See back for complete specs

## Featuring Surface Tension Transfer® (STT®) Process.

The Invertec® STT® II power source combines high frequency inverter technology with advanced Waveform Control Technology® to provide a better welding solution than traditional short arc MIG.

### FEATURES

- ▶ **Controlled penetration and outstanding heat input control** - Ideal for welding joints with open root, gaps, or on thin material with no burnthrough.
- ▶ **Reduced spatter and fumes** - Current is controlled to achieve optimal metal transfer.
- ▶ **Various shielding gases** - STT® may be used with various gas blends including 100% CO<sub>2</sub> and Argon or Helium blends. Larger diameter wires can typically be used.
- ▶ **Good bead control and faster travel speeds** - Can replace TIG (GTAW) in many applications without sacrificing appearance or quality.
- ▶ **Background and Tailout Current** - Accurately control fine and coarse heat input for reduced distortion and burnthrough as well as proper penetration.
- ▶ **Adjustable Hot Start** - controls the heat at the start of the weld.



Shown: K1525-1

### APPLICATIONS

- ▶ Sheet Metal Fabrication
- ▶ Pipe Root Pass Welding

### WHAT'S INCLUDED

- K1525-1 Includes:**
- ▶ Sense Lead Kit, 25 ft. (7.6 m)

### INPUT



### OUTPUT



Two Year Extended Warranty Available in the U.S.A. and Canada.



## WHAT IS STT® (SURFACE TENSION TRANSFER®)?

**STT® (Surface Tension Transfer®)** is a controlled GMAW short circuit transfer process that uses current controls to adjust the heat independent of wire feed speed, resulting in superior arc performance, good penetration, low heat input control, and reduced spatter and fumes.

For more information see Nextweld® Document NX-2.20

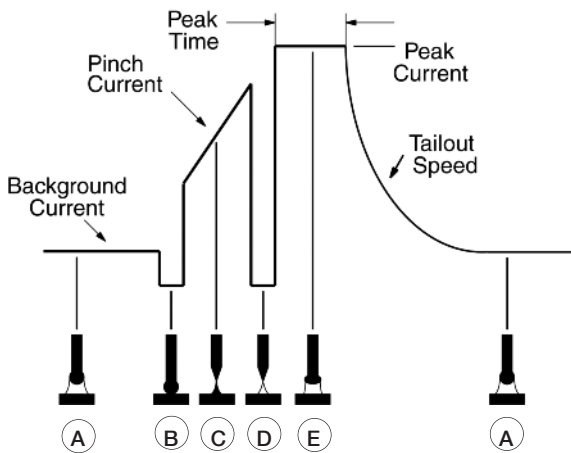


Conventional CV short circuit transfer using CO<sub>2</sub> and .045 in. solid wire.

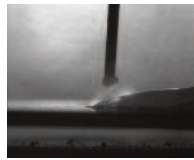


STT® using CO<sub>2</sub> and .045 in. solid wire. Note reduced spatter and fume.

### The STT® Process



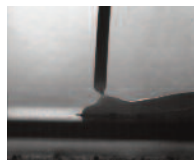
A. STT® produces a uniform molten ball and maintains it until the “ball” shorts to the puddle.



B. When the “ball” shorts to the puddle, the current is reduced to a low level allowing the molten ball to wet into the puddle.



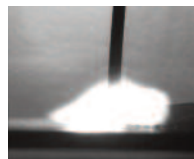
C. Automatically, a precision PINCH CURRENT waveform is applied to the short. During this time, special circuitry determines when the short is about to break and reduces the current to avoid the spatter producing “explosion”.



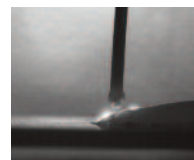
D. STT® circuitry re-establishes the welding arc at a low current level.



E. STT® circuitry senses that the arc is re-established, and automatically applies PEAK CURRENT, which sets the proper arc length. Following PEAK CURRENT, internal circuitry automatically switches to the BACKGROUND CURRENT, which serves as a fine heat control. Additionally, the TAILOUT ramp speed is controlled to provide a coarse heat control, returning the arc to the starting point (A).

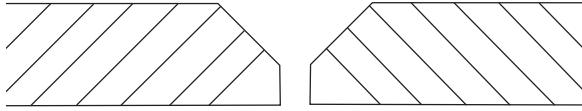


A. STT® produces a uniform molten ball and maintains it until the “ball” shorts to the puddle.



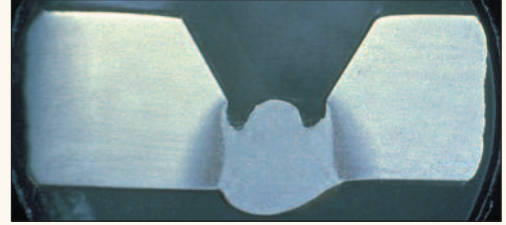
**Using STT® for Open Root welding**

Open root welding is used for pipe and single-sided plate welding in situations that preclude welding from both sides of the material. This type of welding is common in the petrochemical and process piping industries.



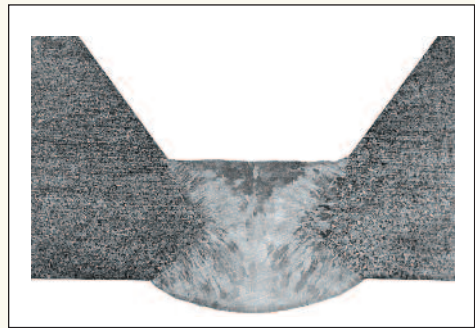
**Advantages of STT® Open Root**

- **Penetration Control**
  - Provides reliable root pass and complete back bead.
  - Ensures excellent sidewall fusion.
- **Cost Reduction**
  - Uses 100% CO<sub>2</sub>, the lowest cost gas, when welding carbon steel.
- **Flexibility**
  - Provides the capability of welding stainless steel, nickel alloys, and mild or high strength steels without compromising weld quality.
  - Capable of welding out of position.
- **Low Heat Input**
  - Reduces burnthrough and distortion.
- **Low Hydrogen Weld Metal Deposit**
- **Speed**
  - High quality open root welds at faster travel speeds than GTAW.
- **Current Control Independent of Wire Feed Speed**
  - Allows operator to control the heat input to the weld puddle.
- **Ease of Operator Use**
  - More forgiving process than conventional short arc welding with CV machines.



Open Root Pass with Stick Electrode

Stick welding with cellulose electrodes provides good fusion characteristics, but leaves deep wagon tracks (requiring more labor for grinding), a very convex root weld, and a high hydrogen deposit.



Open Root Pass with STT® provides a weld ligament thickness of approximately 0.22 in.

**Note these advantages:**

- Superior weld profile (no wagon tracks)
- Slight convexity of root weld
- Low hydrogen deposit

**STT® Open Root Application**



Inside of an 8 in. x .375 in. wall API 5L-X52 pipe, welded in 5G position.

**Comparing STT® to conventional processes**

**Advantages of STT® replacing short-arc GMAW:**

- Significantly reduces lack of fusion
- Good puddle control
- Capable of producing consistent X-ray quality welds
- Reduced training time
- Lower fume generation and spatter
- Can use various compositions of shielding gas
- 100% CO<sub>2</sub> (on mild steel)

**Advantages of STT® replacing GTAW:**

- Four times faster than GTAW
- Vertical down welding
- Reduced training time
- Can use various compositions of shielding gas
- 100% CO<sub>2</sub> (on mild steel)
- Welds stainless, nickel alloys and mild steel
- Consistent x-ray quality welds

**WHEN to use STT®**

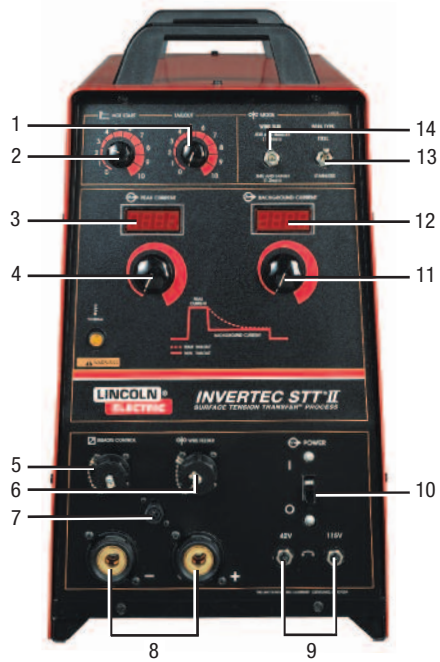
STT® is the process of choice for low heat input welds.

**STT® is also ideal for:**

- Open root – pipe and plate
- Thin gauge material – automotive
- Stainless steel and nickel alloy – petrochemical utility and food industry
- Silicon bronze - automotive
- Galvanized steel
- Semiautomatic and robotic applications

**STT-II**

1. Tailout Control
2. Hot Start Control
3. Peak Current LED Display
4. Peak Current Control Knob
5. 10 Pin Remote Control for Peak and Background Current
6. 14 Pin Wire Feeder Control with 42V/115V Auxiliary Power
7. Sense Lead Connection, [K940-25, 25 ft. (7.6 m) Sense Lead Kit included]
8. Twist Mate™ Output Connectors
9. 42V/115V Circuit Breakers
10. Power Switch
11. Background Current Control Knob
12. Background Current LED Display
13. Wire Mode Switch
14. Wire Diameter Switch



**STT®-10 Control Box**

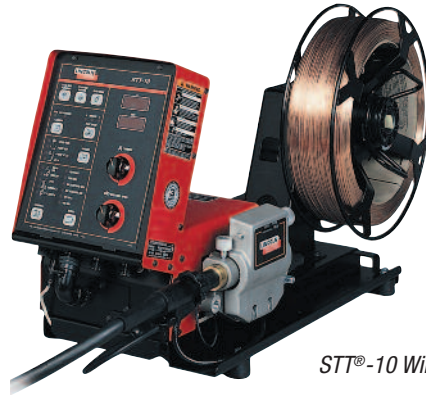
1. Adjust WIRE FEED SPEED to control the deposition rate
2. Current Control
3. Dual Procedure Controls
4. Large, Easy To Ready Digital Meters
5. Adjustable Cold Wire Feed
6. Adjust PEAK CURRENT to control the arc length  
Adjust BACKGROUND CURRENT to control heat input (fine)
7. Trigger Mode Selections
8. Adjust TAILOUT to control heat input (coarse)  
Adjust HOT START to control the heat input at the start of the weld.



**Bench System****Invertec® STT® II Power Source/STT® 10 Wire Feeder**

Top wire feeder user interface and added traction with four roll drive system.

- Invertec® STT® II (K1525-1)
- STT®-10 Wire Feeder (K1560-2)
- Power Source to Feeder Cable (K1758-10)
- Drive Roll Kit [KP1505-035S for .035 in. (0.9 mm) wire or KP1505-045S for .040-.045 in. (1.0-1.1 mm) wire]
- Magnum® PRO Curve™ 200 Ready-Pak®, 15 ft. (3 m), .035-.045 (0.9-1.1 mm) wire diameter with K466-10 Gun Connector Kit
- Work Cable and Work Clamp
- Optional K940 Sense Leads

*STT®-10 Wire Feeder***Portable System****Invertec® STT® II Power Source/LN-25 PRO Dual Power Wire Feeder**

Rugged enclosed feeder - a great system for construction or shipbuilding.

- Invertec® STT® II (K1525-1)
- LN-25 PRO Dual Power Model (K2614-6)
- Control Cable (K1819-10)
- Drive Roll Kit [KP1696-035S for 0.35 in. (0.9 mm) wire or KP1696-045S for .040-.045 in. (1.0-1.1mm) wire]
- Magnum® PRO Curve™ 200 Ready-Pak®, 15 ft. (3 m), .035-.045 in. (0.9-1.1 mm) wire diameter with K466-10 Gun Connector Kit
- Work Cable and Work Clamp

*LN-25 PRO Dual Power Wire Feeder*

For more information on the LN-25 PRO Dual Power Wire Feeder refer to Lincoln publication E8.101.

## RECOMMENDED ACCESSORIES

### GENERAL OPTIONS



**Weld Fume Control Solutions**  
Lincoln Electric offers a wide variety of weld fume control solutions, ranging from portable systems easily wheeled around the shop to shop-wide central systems servicing many dedicated welding stations.  
**Request Publication MC08-70**



**Inverter and Wire Feeder Cart**  
Rear-wheeled cart includes front casters and no-lift gas bottle platform. Convenient handles allow for easy cable storage while full length side trays store parts and tools. Shipped fully assembled. Small footprint fits through 30 inch door.  
**Order K1764-1**



**Dual Cylinder Kit**  
Permits side-by-side mounting of two full size gas cylinders, with easy loading. For use with K1764-1 cart.  
**Order K1702-1**



**Work Voltage Sense Lead Kit**  
Recommended for extended cable length. Application allows machine to sense voltage directly at the work piece for improved arc performance  
**Order K940-25** for 25 ft. (7.6 m)  
**Order K940-75** for 75 ft. (23 m)



**Heavy Duty Work Voltage Sense Lead Kit**  
Required to accurately monitor voltage at the arc for heavy duty applications.  
**Order K1811-50** for 50 ft. (15.2 m)  
**Order K1811-100** for 100 ft. (30 m)



**Coaxial Cable**  
Recommended for STT® and pulse welding when using long distances between feeder and power source. Lug to lug connection.  
**Order K1796-25**  
25 ft. (7.6 m), 1/0 dia. 350 amps @ 60% duty cycle  
**Order K1796-50**  
50 ft. (15.2 m), 1/0 dia. 350 amps @ 60% duty cycle  
**Order K1796-75**  
75 ft. (23 m), 1/0 dia. 300 amps @ 60% duty cycle  
**Order K1796-100**  
100 ft. (30 m), 1/0 dia. 300 amps @ 60% duty cycle  
**Order K2593-100**  
100 ft. (30 m), #1 dia. 250 amps @ 100% duty cycle



**Twist Mate™ Cable Plug**  
For connecting welding cable to output terminal receptacles. For 1/0-2/0 (50-70 mm<sup>2</sup>) cable.  
**Order K852-70**



**Twist Mate™ Cable Plug**  
For connecting welding cable to output terminal receptacles. For 2/0-3/0 (70-95 mm<sup>2</sup>) cable.  
**Order K852-95**



**Twist Mate™ Cable Receptacle**  
For connecting welding cable to Twist Mate™ cable plug. For 1/0-2/0 (50-70 mm<sup>2</sup>) cable.  
**Order K1759-70**

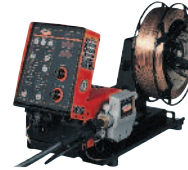


**Twist Mate™ Cable Receptacle**  
For connecting welding cable to Twist Mate™ cable plug. For 2/0-3/0 (70-95 mm<sup>2</sup>) cable.  
**Order K1759-95**



**Twist Mate™ to Lug Adapter**  
For connection of lugged cable to Twist Mate™ connectors, 18 in. (457 mm) long.  
**Order K2176-1**

### WIRE FEEDER OPTIONS



**STT®-10 Wire Feeder**  
The sophisticated STT®-10 Process Controller was designed specifically to work with the revolutionary STT® II power source. Microprocessor controls make it easy to develop optimal procedures and set the range of operator adjustments. Dual procedure control can increase or decrease the energy in the arc without changing the wire feed speed.  
**Order K1560-2**



**LN-25 PRO Dual Power Wire Feeder**  
The LN-25 PRO Dual Power wire feeder is ideal for field construction and fabrication, shipyards, and rental companies. It features a voltage control knob for superior arc control, digital meters for increased monitoring, MIG-STT® capability, and can be powered with either a control cable or across-the-arc.  
**Order K2614-6**



**Magnum® PRO Guns**  
Choose Barrel or Curve™ semiautomatic GMAW 200-550 amp guns.  
**See Publication E12.09**



**Magnum® Connector Kit**  
Used for connecting Magnum® gun and cable assembly to feeder.  
**Order K466-10** for STT®-10 and LN-25 PRO Dual Power feeders.

## PRODUCT SPECIFICATIONS

### Invertec® STT® II Power Source

Product Name	Product Number	Input Power Voltage/Phase/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 STT® II	K1525-1	208/230/460/3/60	225A/29V/60% 200A/28V/100%	32/30/16A	Peak Current: 0-450A Background Current: 0-125A Max. OCV: 85V	23.2 x 13.2 x 24.4 (589 x 336 x 620)	117 (53)
	K1526-1	200-208/220-230/380-415/440-460/3/50/60		33/30/18/17/16A			
	K1526-2	200/208/380/400/415/3/50/60		36/34/20/19/18A			
Invertec STT® II CE	K1527-1	200/220/380/415/440/3/50/60		33/30/18/17/16A			
	K1527-2	200/208/380/400/415/3/50/60		36/34/20/19/18A			

### STT®-10 Wire Feeder

Product Name	Product Number	Wire Feed Speed Range ipm (m/min)	Wire Size Range in. (mm)	Input	H x W x D inches (mm)	Net Weight lbs. (kg)
STT® 10	K1560-2	35-500 (0.8-12.7)	Solid: .023-.052 (0.6-1.4)	42 VAC 50/60 Hz 4 Amps	16 x 15 x 31 (406 x 381 x 787)	65 (29.5)

For best welding results with Lincoln Electric equipment, always use Lincoln Electric consumables. Visit [www.lincolnelectric.com](http://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.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to [www.lincolnelectric.com](http://www.lincolnelectric.com) for any updated information.

**LINCOLN®**  
**ELECTRIC**  
THE WELDING EXPERTS®