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)

Input Output

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% CO2 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.

Applications
- Sheet Metal Fabrication
- Pipe Root Pass Welding

What’s Included
K1525-1 Includes:
- Sense Lead Kit, 25 ft. (7.6 m)
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 CO₂ and .045 in. solid wire.

STT® using CO₂ 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% CO₂, 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.

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% CO₂ (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% CO₂ (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
KEY CONTROLS

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 Read 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.
SYSTEM SELECTION

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

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. (1.0-1.1 mm) 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

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

STT® -10 Wire Feeder

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 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. More-

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For best welding results with Lincoln Electric equipment, always use Lincoln Electric consumables. Visit w

Invertec® STT® II Power Source

<table>
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<tr>
<th>Product Name</th>
<th>Product Number</th>
<th>Input Voltage/Phase/Hertz</th>
<th>Rated Output</th>
<th>Rated Output</th>
<th>Input Current @ Rated Output</th>
<th>Input Voltage/Phase/Hertz</th>
<th>Output Range</th>
<th>H x W x D inches (mm)</th>
<th>Net Weight lbs. (kg)</th>
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<tbody>
<tr>
<td>Invertec</td>
<td>K1525-1</td>
<td>208/230/460/3/60</td>
<td>225A/299/60%</td>
<td>32/30/16A</td>
<td>23.2 x 13.2 x 24.4</td>
<td>200A/28/100%</td>
<td>33/30/18/17/16A</td>
<td>(589 x 336 x 620)</td>
<td>117</td>
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<td>STT® II</td>
<td>K1526-1</td>
<td>200-208/220-230/380-415/440/460/3/5/60</td>
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<td>36/4/0/19/18/16A</td>
<td>200A/28/100%</td>
<td>33/30/18/17/16A</td>
<td>(53)</td>
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<td>(53)</td>
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<td>STT® II CE</td>
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<td>(53)</td>
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STT®-10 Wire Feeder

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<thead>
<tr>
<th>Product Name</th>
<th>Product Number</th>
<th>Wire Feed Speed Range</th>
<th>Wire Size Range</th>
<th>Input</th>
<th>H x W x D inches (mm)</th>
<th>Net Weight lbs. (kg)</th>
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<tr>
<td>STT® 10</td>
<td>K1560-2</td>
<td>35-500 (0.8-12.7)</td>
<td>Solid: 0.025-0.05 (0.6-1.4)</td>
<td>42 VAC</td>
<td>16 x 15 x 31 (408 x 381 x 787)</td>
<td>65 (29.5)</td>
</tr>
</tbody>
</table>


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 the use of our products. Our employees respond to inquiries to the best of their ability based on the 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 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 fitness for any customer’s particular purpose is specifically disclaimed.

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