

Invertec® STT® II



Featuring the Surface Tension Transfer® (STT) Process

Control Heat Input, Spatter and Fume

The revolutionary 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. Unlike CV MIG machines, the STT machine has no voltage control knob. STT uses current controls to adjust the heat independent of the wire feed speed, so changes in electrode extension do not affect heat. Low heat input welds can be produced without overheating or burning through, and distortion is minimized. Spatter and fumes are reduced because the electrode is not overheated — even when welding with larger diameter wires and 100% CO₂ shielding gas.

Processes

GMAW-STT

Advantage Lincoln

- 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.
- Reduced welding costs — Ability to use 100% CO₂ shielding gas with larger diameter wires.
- Various shielding gases — STT may be used with various gas blends of Argon including Helium.
- Good bead control and faster travel speeds — Can replace TIG (GTAW) in many applications without sacrificing appearance.
- 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.
- Manufactured under a quality system certified to ISO 9001 requirements and ISO 14001 environmental standards.
- Three-year Lincoln warranty on parts and labor.

Description

Output   Input   

Base Unit Includes

Twist-Mate® Cable Plugs (Qty. 2), STT II Sense Lead Kit, 25 ft. (7.6m)

Recommended General Options

Power Source Remote Output Control, Inverter and Wire Feeder Cart, Dual Cylinder Kit, STT II Sense Lead Kit, Coaxial Cable, Twist-Mate Cable Plug, Twist-Mate Cable Receptacle, Twist-Mate to Lug Adapter

Recommended Wire Feeder Options

STT-10 Wire Feeder, LN-742 Wire Feeder, LN-15 Control Cable Model, Magnum Gun and Cable Assembly, Magnum Connector Kit

Order

K1525-1	STT II	208/230/460/3/60
K1526-1	STT II	International 200/220/380/415/440/3/50/60
K1526-2	STT II	International 200/208/380/400/415/3/50/60
K1527-1	STT II	CE-Approved 200/220/380/415/440/3/50/60
K1527-2	STT II	CE-Approved 200/208/380/400/415/3/50/60

TECHNICAL SPECIFICATIONS

Product Name	Product Number	Input Power	Rated Output Current/Voltage/Duty Cycle	Input Current@ Rated Output	Output Range	Dimensions H x W x D inches (mm)	Weight lbs. (kg)
Invertec STT II	K1525-1	208/230/460/3/60	225A / 29V / 60% 200A / 28V / 100% Max. OCV: 85V	32/30/16A	Peak Current: 0-450A Background Current: 0-125A	23.2 x 13.2 x 24.4 (589 x 336 x 620)	117 (53)
	K1526-1 International	200/220/380/415/440/3/50/60		33/30/18/17/16A			
	K1526-2 International	200/208/380/400/415/3/50/60		36/34/20/19/18A			
	K1527-1 CE-Approved	200/220/380/415/440/3/50/60		33/30/18/17/16A			
	K1527-2 CE-Approved	200/208/380/400/415/3/50/60		36/34/20/19/18A			

A CLOSER LOOK



WHAT IS NEXTWELD®?

Nextweld integrates Lincoln's technologies, processes and products to create a comprehensive, flexible, user-friendly welding system that can increase efficiency and reduce fabrication costs. Waveform Control Technology™ and digital communications

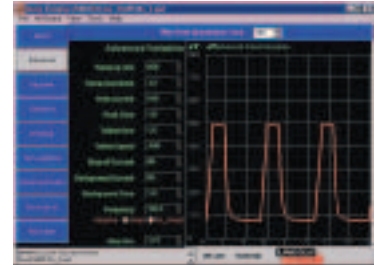
provide the foundation for Nextweld innovations like Pulse-On-Pulse™, Power Mode™, STT® and ArcLink®. Look for Nextweld for ultimate arc control, high efficiency/reliability and seamless system integration.

Waveform Control Technology®

Driving Superior Welding Performance

Lincoln's Waveform Control Technology controls and shapes the output waveforms (or weld modes) to adapt to virtually any application, material or weld position. Waveform Control Technology makes it possible to take advantage of Lincoln Nextweld innovations like the STT Process using the STT II.

For more information see Nextweld Document NX-1.10



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

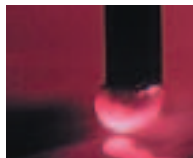
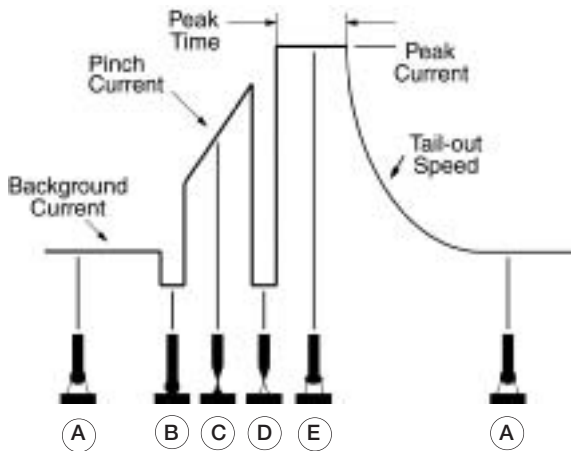


Conventional CV short circuit transfer using CO₂ and .045" solid wire.

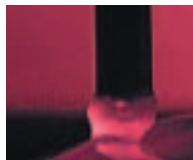


STT using CO₂ and .045" solid wire. Note reduced spatter and fume.

The STT Process



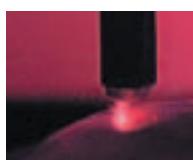
A. STT produces a uniform molten ball and maintains it until the "ball" shorts to the puddle.



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 wave form is applied to the short. During this time, special circuitry determines that the short is about to break and reduces the current to avoid the spatter producing "explosion".



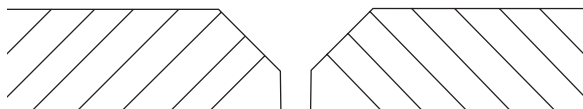
D. STT circuitry re-establishes the welding arc at a low current level.



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.

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.

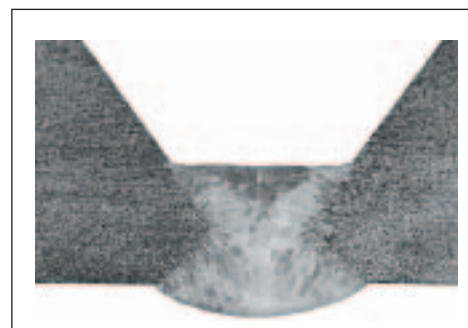
Ease of Operator Use

- More forgiving process than conventional short arc welding with CV machines.

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 Stick Electrode



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

- 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.



STT process using 100% CO₂ and .045 in. (1.2mm) wire.

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

UTILIZING STT ON THE STT II

Adjust WIRE FEED SPEED to:

- control the deposition rate

Adjust PEAK CURRENT to:

- control the arc length

Adjust BACKGROUND CURRENT to:

- control heat input (fine)

Adjust TAILOUT to:

- control heat input (coarse)

Adjust HOT START to:

- control the heat input at the start of the weld.

FEATURES

Key Controls

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. (7.6m) Sense Lead Kit included]
8. Twist-Mate Output Connectors (2 Twist-Mate Plugs (M15479) Included)
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



QUALITY AND RELIABILITY

- Electronic and thermostatic protection from current overload and excessive temperatures with thermal indicator light.
- Three-year Lincoln warranty on parts and labor.
- Manufactured under a quality system certified to ISO 9001 requirements and ISO 14001 environmental standards.



Printed circuit boards are environmentally-shielded using Lincoln's engineered potting and protective frame trays.

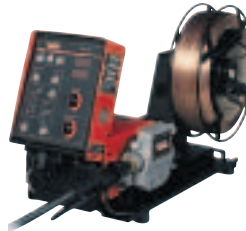


SYSTEM SELECTION

Invertec STT II/STT 10 Deluxe System

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" (0.9mm) wire or KP1505-045S for .040-.045" (1.0-1.1mm) wire]
- Magnum 200 Gun Package (K497-21)
- Work Cable and Work Clamp



STT-10 Wire Feeder



Invertec STT II/LN-15 Portable System

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

- Invertec STT II (K1525-1)
- LN-15 Control Cable Model (K1871-1)
- Control Cable (K1819-10)
- Drive Roll Kit [KP1696-035S for 0.35" (0.9mm) wire or KP1696-045S for .040-.045" (1.0-1.1mm) wire]
- Magnum 200 Gun Package (K497-21)
- Work Cable and Work Clamp



LN-15 Control Cable Model



Invertec STT II/LN-742 Standard System

Two roll drive - the most economical system for STT shop welding.

- Invertec STT II (K1525-1)
- LN-742 Wire Feeder (with 2 drive rolls) (K617-1)
- Power Source to Feeder Cable (K1840-10)
- Drive Roll Kit [KP653 -035S for .035-.045" (0.9-1.1mm) wire or KP653-052S for .045-.052" (1.1-1.3mm) wire]
- Magnum 200 Gun Package (K497-21)
- Magnum Connector Kit (K466-1)
- Work Cable and Work Clamp



LN-742 Wire Feeder



GENERAL OPTIONS



Power Source Remote Output Control
Remotely controls peak and background current. 10 pin remote control with 25 ft. (7.6m) of cable.
Order K942-1



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



STT II Sense Lead Kit
Required to accurately monitor voltage at the arc for heavy duty applications. 25 ft. length included with Invertec STT II. 75 ft. (23m) length.
Order WK1811-75



Coaxial Cable
Recommended for STT and pulse welding when using long distances between feeder and power source.
Order K1796-25
25 ft. (7.6m), 350 amps
Order K1796-50
50 ft. (15.2m), 350 amps
Order K1796-75
75 ft. (22.8m), 325 amps
Order K1796-100
100 ft. (30.4m), 300 amps

GENERAL OPTIONS CONT.



Twist-Mate Cable Plug
For connecting welding cable to output terminal receptacles. For 1/0-2/0 (50-70mm²) cable.
Order K852-70



Twist-Mate Cable Plug
For connecting welding cable to output terminal receptacles. For 2/0-3/0 (70-95mm²) cable.
Order K852-95



Twist-Mate Cable Receptacle
For connecting welding cable to Twist-Mate cable plug. For 1/0-2/0 (50-70mm²) cable.
Order K1759-70



Twist-Mate Cable Receptacle
For connecting welding cable to Twist-Mate cable plug. For 2/0-3/0 (70-95mm²) cable.
Order K1759-95



Twist-Mate to Lug Adapter
For connection of lugged cable to Twist-Mate connectors, 18" (457mm) 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.
See Publication E8.190

WIRE FEEDER OPTIONS CONT.



LN-742 Wire Feeder

The LN-742 semiautomatic wire feeder features a trigger mode selection for 2-step or 4-step and time controls for burnback, spot times and preflow/post-flow shielding gas. Two-roll wire drive for positive wire feeding. Dynamic braking system minimizes crater sticking problems. Tool-less quick release wire drive tension system for easy wire on gun changes.

See Publication E8.20



LN-15 Control Cable Model

LN-15 is one of the smallest and most maneuverable wire feeders available on the market today. Control Cable model includes STT capabilities and is compatible with the STT II power source for outstanding welding performance including pulse welding on a wide variety of steel, stainless steel, aluminum and alloy materials.

See Publication E8.60



Magnum 200 Gun and Cable Assembly

With 15 ft. (4.5mm) cable. For .035-.045 (0.9-1.1mm) wire.

Order:

K497-21 for STT-10 and LN-15

K497-1 for LN-742



Magnum Connector Kit

Used for connecting Magnum gun and cable to assembly.

Order:

K466-1 for LN-742

K466-10 for STT-10 and LN-15

INVERTEC® STT® II ORDER FORM

PRODUCT DESCRIPTION	ORDER NUMBER	QUANTITY	PRICE
STT II (208/230/460/3/60)	K1525-1		
STT II International (200/220/380/415/440/415/3/50/60)	K1526-1		
STT II International (200/208/380/400/415/3/50/60)	K1526-2		
STT II CE-Approved (200/220/380/415/440/3/50/60)	K1527-1		
STT II CE-Approved (200/208/380/400/415/3/50/60)	K1527-2		
RECOMMENDED GENERAL OPTIONS			
Power Source Remote Output Control	K942-1		
Inverter and Wire Feeder Cart	K1764-1		
Dual Cylinder Kit	K1702-1		
STT II Sense Lead Kit, 75 ft. (23m) (included with power source)	WK1811-75		
Coaxial Cable	K1796-xx		
Twist-Mate Cable Plug, 1/0-2/0 (50-70mm ²) cable	K852-70		
Twist-Mate Cable Plug, 2/0-3/0 (70-95mm ²) cable	K852-95		
Twist-Mate Cable Receptacle, 1/0-2/0 (50-70mm ²) cable	K1759-70		
Twist-Mate Cable Receptacle, 2/0-3/0 (70-95mm ²) cable	K1759-95		
Twist-Mate to Lug Adapter	K2176-1		
RECOMMENDED WIRE FEEDER OPTIONS			
STT-10 Wire Feeder	See Publication E8.190		
LN-742 Wire Feeder	See Publication E8.20		
LN-15 Control Cable Model	See Publication E8.60		
Magnum 200 Gun and Cable Assembly			
- for STT-10 and LN-15	K497-21		
- for LN-742	K497-1		
Magnum Connector Kit			
- for STT-10 and LN-15	K466-10		
- for LN-742	K466-1		
	TOTAL:		

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 advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.

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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