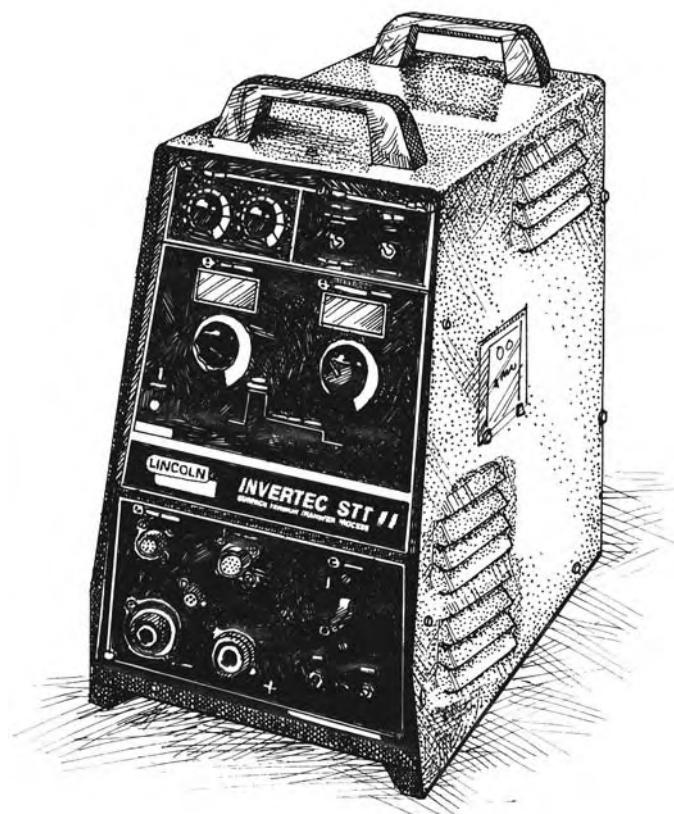


**INVERTEC® STT® II (CE)**For use with machines having Code Numbers: **11366, 11367****Safety Depends on You**

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT. And, most importantly, think before you act and be careful.



ISO/IEC 60974-1

**OPERATOR'S MANUAL**
**LINCOLN®**  
**ELECTRIC**

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• World's Leader in Welding and Cutting Products •

• Sales and Service through Subsidiaries and Distributors Worldwide •

Cleveland, Ohio 44117-1199 U.S.A. TEL: 216.481.8100 FAX: 216.486.1751 WEB SITE: [www.lincolnelectric.com](http://www.lincolnelectric.com)

## ⚠ WARNING



### CALIFORNIA PROPOSITION 65 WARNINGS



Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

The Above For Diesel Engines

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The Above For Gasoline Engines

**ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.**

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

**BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.**



### FOR ENGINE powered equipment.

1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.



1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.



1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.



1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.



1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



### ELECTRIC AND MAGNETIC FIELDS may be dangerous

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

2.d.1. Route the electrode and work cables together - Secure them with tape when possible.

2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.

2.d.5. Do not work next to welding power source.

Mar '95



## ELECTRIC SHOCK can kill.

- 3.a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- 3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:**
- Semiautomatic DC Constant Voltage (Wire) Welder.
  - DC Manual (Stick) Welder.
  - AC Welder with Reduced Voltage Control.
- 3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".
- 3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- 3.e. Ground the work or metal to be welded to a good electrical (earth) ground.
- 3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- 3.g. Never dip the electrode in water for cooling.
- 3.h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- 3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
- 3.j. Also see Items 6.c. and 8.



## ARC RAYS can burn.

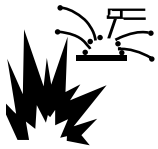
- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- 4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



## FUMES AND GASES can be dangerous.

- 5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit Values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**
5. b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.
- 5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- 5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- 5.e. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. MSDS forms are available from your welding distributor or from the manufacturer.
- 5.f. Also see item 1.b.

AUG 06



## WELDING SPARKS can cause fire or explosion.

6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot

materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.

6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

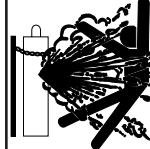
6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).

6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

6.h. Also see item 1.c.



## CYLINDER may explode if damaged.

7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

7.c. Cylinders should be located:

- Away from areas where they may be struck or subjected to physical damage.

- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.

7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.



## FOR ELECTRICALLY powered equipment.

8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.

8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Mar '95

## PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté spécifiques qui paraissent dans ce manuel aussi bien que les précautions de sûreté générales suivantes:

### Sûreté Pour Soudage A L'Arc

1. Protégez-vous contre la secousse électrique:
  - a. Les circuits à l'électrode et à la pièce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vêtements mouillés. Porter des gants secs et sans trous pour isoler les mains.
  - b. Faire très attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher métallique ou des grilles métalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
  - c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état de fonctionnement.
  - d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
  - e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
  - f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces précautions pour le porte-électrode s'appliquent aussi au pistolet de soudage.
2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas où on recoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.
3. Un coup d'arc peut être plus sévère qu'un coup de soliel, donc:
  - a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
  - b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
  - c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.
4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.

5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans latéraux dans les zones où l'on pique le laitier.
6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.
7. Quand on ne soude pas, poser la pince à un endroit isolé de la masse. Un court-circuit accidentel peut provoquer un échauffement et un risque d'incendie.
8. S'assurer que la masse est connectée le plus près possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaînes de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'échauffement des chaînes et des câbles jusqu'à ce qu'ils se rompent.
9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particulièrement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumeés toxiques.
10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgène (gas fortement toxique) ou autres produits irritants.
11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

## PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le châssis du poste conformément au code de l'électricité et aux recommandations du fabricant. Le dispositif de montage ou la pièce à souder doit être branché à une bonne mise à la terre.
2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.
3. Avant de faire des travaux à l'intérieur de poste, la débrancher à l'interrupteur à la boîte de fusibles.
4. Garder tous les couvercles et dispositifs de sûreté à leur place.

# Thank You

for selecting a **QUALITY** product by Lincoln Electric. We want you to take pride in operating this Lincoln Electric Company product  
... as much pride as we have in bringing this product to you!

## **Please Examine Carton and Equipment For Damage Immediately**

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, Claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Product \_\_\_\_\_

Model Number \_\_\_\_\_

Code Number or Date Code \_\_\_\_\_

Serial Number \_\_\_\_\_

Date Purchased \_\_\_\_\_

Where Purchased \_\_\_\_\_

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above. The code number is especially important when identifying the correct replacement parts.

## **On-Line Product Registration**

- Register your machine with Lincoln Electric either via fax or over the Internet.
- For faxing: Complete the form on the back of the warranty statement included in the literature packet accompanying this machine and fax the form per the instructions printed on it.
- For On-Line Registration: Go to our **WEB SITE at [www.lincolnelectric.com](http://www.lincolnelectric.com)**. Choose "Quick Links" and then "Product Registration". Please complete the form and submit your registration.

**Read this Operators Manual completely** before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the safety instructions we have provided for your protection. The level of seriousness to be applied to each is explained below:

### **WARNING**

This statement appears where the information **must** be followed **exactly** to avoid **serious personal injury** or **loss of life**.

### **CAUTION**

This statement appears where the information **must** be followed to avoid **minor personal injury** or **damage to this equipment**.

# TABLE OF CONTENTS

|                                                                    | Page                |
|--------------------------------------------------------------------|---------------------|
| <b>Safety .....</b>                                                | <b>i-iv</b>         |
| <b>Installation .....</b>                                          | <b>Section A</b>    |
| Technical Specifications .....                                     | A-1, A-2            |
| Location .....                                                     | A-3                 |
| Stacking .....                                                     | A-3                 |
| Tilting .....                                                      | A-3                 |
| Machine Grounding and High Frequency Interference Protection ..... | A-3                 |
| Input Connections .....                                            | A-3                 |
| Supply Connections .....                                           | A-3                 |
| Input Cable Installation and Connection .....                      | A-4                 |
| Ground Connection .....                                            | A-4                 |
| Input Voltage Reconnect Procedure .....                            | A-5                 |
| Output Connections .....                                           | A-5                 |
| Wire Feeder Output Connections .....                               | A-5                 |
| <b>Operation .....</b>                                             | <b>Section B</b>    |
| Safety Precautions .....                                           | B-1                 |
| General Description .....                                          | B-2                 |
| Recommended Equipment .....                                        | B-2                 |
| Operating Controls .....                                           | B-2                 |
| Design Features and Advantages .....                               | B-2                 |
| Welding Capability .....                                           | B-2                 |
| Limitations .....                                                  | B-2                 |
| Operational Features and Controls .....                            | B-3                 |
| Welding Operation .....                                            | B-4                 |
| Welding Parameters and Guidelines .....                            | B-5                 |
| Welding Procedures for (Steel) Horizontal Fillet .....             | B-5                 |
| Welding Procedures for (Stainless Steel) Horizontal Fillet .....   | B-6                 |
| <b>Accessories .....</b>                                           | <b>Section C</b>    |
| Options/Accessories .....                                          | C-1                 |
| LN-742 or STT-10 Wire Feeder Connection Instructions .....         | C-1                 |
| <b>Maintenance .....</b>                                           | <b>Section D</b>    |
| Safety Precautions .....                                           | D-1                 |
| Input Filter Capacitor Discharge Procedure .....                   | D-1                 |
| Preventive Maintenance .....                                       | D-2                 |
| <b>Troubleshooting .....</b>                                       | <b>Section E</b>    |
| How To Use Troubleshooting Guide .....                             | E-1                 |
| Troubleshooting Guide .....                                        | E-2 - E-6           |
| <b>Diagrams .....</b>                                              | <b>Section F</b>    |
| Wiring Diagram .....                                               | F-1 thru F-3        |
| Dimension Print .....                                              | F-4                 |
| <b>Parts List .....</b>                                            | <b>P-540 Series</b> |

**TECHNICAL SPECIFICATIONS –INVERTEC STT II (CE) (For Code 11366)**

| INPUT- THREE PHASE ONLY                                           |                                 |                                  |                                                         |                                                         |
|-------------------------------------------------------------------|---------------------------------|----------------------------------|---------------------------------------------------------|---------------------------------------------------------|
| STANDARD VOLTAGE                                                  |                                 |                                  | INPUT CURRENT AT RATED OUTPUT                           |                                                         |
| 200/220/380/415/440/3/50/60 HZ                                    |                                 |                                  | 33/30/18/17/16                                          |                                                         |
| RATED OUTPUT                                                      |                                 |                                  |                                                         |                                                         |
| DUTY CYCLE                                                        |                                 | AMPS                             | VOLTS AT RATED AMPS                                     |                                                         |
| 60% Duty Cycle                                                    |                                 | 225                              | 29                                                      |                                                         |
| 100% Duty Cycle                                                   |                                 | 200                              | 28                                                      |                                                         |
| OUTPUT                                                            |                                 |                                  |                                                         |                                                         |
| CURRENT RANGE                                                     |                                 | OPEN CIRCUIT VOLTAGE             | AUXILIARY POWER                                         |                                                         |
| Peak Current <sup>1</sup> 0 - 450 Amps<br>Background 0 - 125 Amps |                                 | 85 VDC Maximum                   | 115 <sup>2</sup> VAC @ 4 Amps<br>42 VAC @ 4 Amps        |                                                         |
| RECOMMENDED INPUT WIRE AND FUSE SIZES                             |                                 |                                  |                                                         |                                                         |
| INPUT VOLTAGE AND FREQUENCY                                       | FUSE(SUPER LAG) OR BREAKER SIZE | INPUT AMPERE RATING ON NAMEPLATE | TYPE 75°C COPPER SUPPLY WIRE IN CONDUIT AWG (IEC) SIZES | TYPE 75°C COPPER GROUND WIRE IN CONDUIT AWG (IEC) SIZES |
| 200/50/60                                                         | 40                              | 33                               | 10 (6 mm <sup>2</sup> )                                 | 10 (6 mm <sup>2</sup> )                                 |
| 220/50/60                                                         | 40                              | 30                               |                                                         |                                                         |
| 380/50/60                                                         | 30                              | 18                               |                                                         |                                                         |
| 415/50/60                                                         | 30                              | 17                               |                                                         |                                                         |
| 440/50/60                                                         | 30                              | 16                               |                                                         |                                                         |
| PHYSICAL DIMENSIONS                                               |                                 |                                  |                                                         |                                                         |
| HEIGHT                                                            | WIDTH                           | DEPTH                            | WEIGHT                                                  |                                                         |
| 23.2 in                                                           | 13.2 in.                        | 24.4 in.                         | 100 lbs.                                                |                                                         |
| 589 mm                                                            | 336 mm                          | 620 mm                           | 46 kg                                                   |                                                         |

<sup>1</sup> At low input voltages (below 208 VAC) and input voltages of 380 VAC through 415 VAC there may be a 15% reduction in Peak Current.

<sup>2</sup> 115 VAC not present on European Models.

**TECHNICAL SPECIFICATIONS –INVERTEC STT II (CE) (For Code 11367)**

| INPUT- THREE PHASE ONLY                              |                                 |                                                  |                                                         |                                                         |
|------------------------------------------------------|---------------------------------|--------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|
| STANDARD VOLTAGE                                     |                                 | INPUT CURRENT AT RATED OUTPUT                    |                                                         |                                                         |
| 200/208/380/400/415/3/50/60 HZ                       |                                 | 36/34/20/19/18                                   |                                                         |                                                         |
| RATED OUTPUT                                         |                                 |                                                  |                                                         |                                                         |
| DUTY CYCLE                                           | AMPS                            | VOLTS AT RATED AMPS                              |                                                         |                                                         |
| 60% Duty Cycle                                       | 225                             | 29                                               |                                                         |                                                         |
| 100% Duty Cycle                                      | 200                             | 28                                               |                                                         |                                                         |
| OUTPUT                                               |                                 |                                                  |                                                         |                                                         |
| CURRENT RANGE                                        | OPEN CIRCUIT VOLTAGE            | AUXILIARY POWER                                  |                                                         |                                                         |
| Peak Current 0 - 450 Amps<br>Background 0 - 125 Amps | 88 VDC Maximum                  | 115 <sup>1</sup> VAC @ 4 Amps<br>42 VAC @ 4 Amps |                                                         |                                                         |
| RECOMMENDED INPUT WIRE AND FUSE SIZES                |                                 |                                                  |                                                         |                                                         |
| INPUT VOLTAGE AND FREQUENCY                          | FUSE(SUPER LAG) OR BREAKER SIZE | INPUT AMPERE RATING ON NAMEPLATE                 | TYPE 75°C COPPER SUPPLY WIRE IN CONDUIT AWG (IEC) SIZES | TYPE 75°C COPPER GROUND WIRE IN CONDUIT AWG (IEC) SIZES |
| 200/50/60                                            | 40                              | 36                                               | 10 (6 mm <sup>2</sup> )                                 | 10 (6 mm <sup>2</sup> )                                 |
| 208/50/60                                            | 40                              | 34                                               |                                                         |                                                         |
| 380/50/60                                            | 30                              | 20                                               |                                                         |                                                         |
| 400/50/60                                            | 30                              | 19                                               |                                                         |                                                         |
| 415/50/60                                            | 30                              | 18                                               |                                                         |                                                         |
| PHYSICAL DIMENSIONS                                  |                                 |                                                  |                                                         |                                                         |
| HEIGHT                                               | WIDTH                           | DEPTH                                            | WEIGHT                                                  |                                                         |
| 23.2 in                                              | 13.2 in.                        | 24.4 in.                                         | 100 lbs.                                                |                                                         |
| 589 mm                                               | 336 mm                          | 620 mm                                           | 46 kg                                                   |                                                         |

<sup>1</sup> 115 VAC not present on European Models.

Read and understand entire Installation Section before starting installation.

## ⚠ WARNING



### **ELECTRIC SHOCK can kill.**

- Only qualified personnel should perform this installation.
- Turn the input power OFF at the disconnect switch or fuse box before installing this equipment.
- Turn the power switch on the Invertec STT "OFF" before connecting or disconnecting input power lines, output cables, or control cables.
- Do not touch electrically hot parts.
- Always connect the ground terminal to a good electrical earth ground.

## SELECT SUITABLE LOCATION

Locate the machine where there is free circulation of clean air. Place the machine so that air can freely circulate into the sides and out of the rear of the machine. Dirt and dust that can be drawn into the machine should be kept to a minimum. Failure to observe these precautions can result in excessive operating temperatures and nuisance shut down of the INVERTEC STT II (CE).

This machine carries an enclosure rating of IP21S. It should not be placed in extremely damp or dirty locations. It should not be exposed to rain or snow.

## STACKING

The INVERTEC STT II (CE) cannot be stacked.

## TILTING

Place the machine on a secure, level surface otherwise the unit may topple over.

## MACHINE GROUNDING AND HIGH FREQUENCY INTERFERENCE PROTECTION

The machine may not be suitable for use in an environment where high frequency is present. For example do not place the machine in close proximity to "TIG" or "PLASMA" operations. To minimize high frequency interference:

Locate the STT II power source more than 15 feet (4.5 m) away from high frequency units and more than 25 feet (7.6 m) separation between ground connections or welding arcs of high frequency units.

Provide proper electrical ground to the machine per local and national electrical codes.

## INPUT CONNECTIONS

### **FAILURE TO FOLLOW THESE INSTRUCTIONS CAN CAUSE IMMEDIATE FAILURE OF COMPONENTS WITHIN THE WELDER.**

Turn the input power off at the disconnect switch before attempting to connect the input power lines.

Connect the green lead of the power cord to ground per local and national electrical codes.

## SUPPLY CONNECTIONS

Be sure the voltage, phase, and frequency of the input supply is as specified on the rating plate. Input Power supply line entry is provided on the case back of the machine. See figure A.1 for location of the rating plate.

The INVERTEC STT II (CE) should be connected only by a qualified electrician. Installation should be made in accordance with local and national codes. Refer to the "Technical Specifications" at the beginning of this section for proper fuse sizes, ground wire, and input supply power cable sizes.

Some models come from the factory with an input power cord. If your model does not include the input power cord install the proper size input cable and ground cable according to "INPUT CABLE INSTALLATION AND CONNECTION".

## CASE BACK

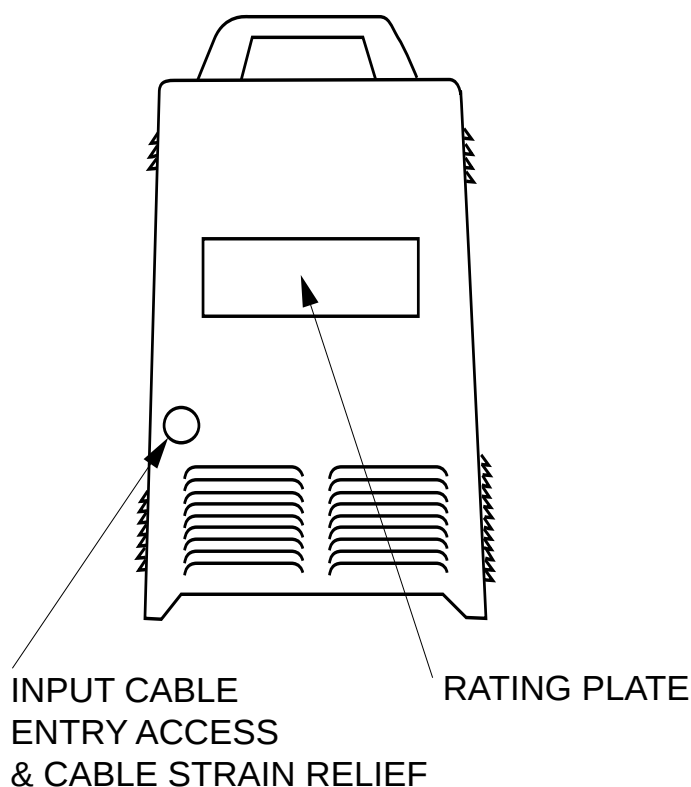


FIGURE A.1 CASE BACK

## INPUT CABLE INSTALLATION AND CONNECTION

A cable strain relief is provided at the supply line entry and is designed to accommodate cable diameters of .310 - 1.070 in. (7.9 - 27.2 mm). On European models the strain relief is designed to accommodate cable diameters of .709 - 1.000 in. (18.0 - 25.4 mm). Refer to "Technical Specifications" at the beginning of this section for the proper input cable sizes. Refer to Figure A.1 and perform the following steps:

1. Remove the wraparound cover of the INVERTEC STT II (CE).
2. Feed the input cable through the input cable entry access hole at the right rear of the machine.
3. Route the cable through the cable hangers, located along the lower right inside edge of the machine, up to the power switch located on the front panel.
4. Strip away 102 mm (4 in.) of the outer jacket. Trim fillers and strip conductor jackets to connect to the power switch.

5. Connect the three phase line conductors to the power switch terminals labeled U, V and W. Tighten the connections to 3.0 Nm. (27 in.-lb.) torque.



6. Securely tighten the cable strain relief located on the case back of the machine.

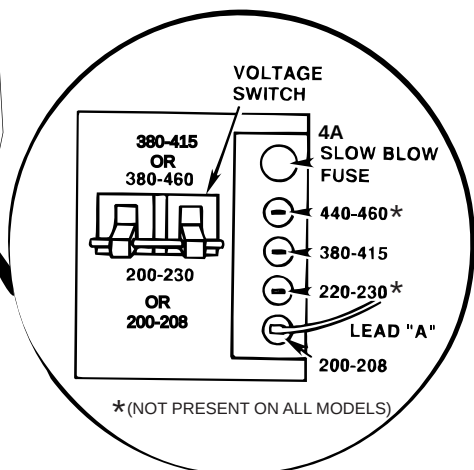
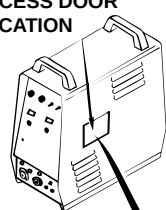
## GROUND CONNECTION

1. Connect the ground terminal to earth ground per National Electrical Code.
2. Replace the wraparound cover of the INVERTEC STT II (CE).



INVERTEC STT II (CE)



ACCESS DOOR  
LOCATION

## FIGURE A.2 RECONNECT PANEL INPUT VOLTAGE RECONNECT PROCEDURE

As shipped from the factory, multiple voltage machines are internally configured for the highest input voltage (440-460 VAC), for Code 11366 and (380-415 VAC), for Code 11367.

1. For Connections to 440 or 460 VAC **verify** the internal configurations to the procedures shown below and refer to Figure A.2.
2. For Connections to 200,208,220,230,380,400 or 415 VAC follow the procedure shown below and refer to figure A.2.

### ⚠ WARNING

**NOTE: Turn main power to the machine OFF before performing the reconnect procedure. Failure to do so will result in damage to the machine. DO NOT switch the reconnect bar with machine power ON.**

| To Operate at                  | Procedure                                                                                                                                                                                                                 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 460 or 440 VAC<br>(Code 11366) | <ol style="list-style-type: none"> <li>1. Open reconnect panel access door on wraparound.</li> <li>2. Move input voltage switch to Voltage = 380-460V position.</li> <li>3. Move lead "A" to 440-460 Terminal.</li> </ol> |

380 or 415 VAC  
(Codes 11366)

1. Open reconnect panel access door on wraparound.
2. Move input voltage switch to Voltage = 380-460V position.
3. Move lead "A" to 380-415 Terminal.

380,400 or 415 VAC  
(Codes 11367)

1. Open reconnect panel access door on wraparound.
2. Move input voltage switch to Voltage = 380-415V position.
3. Move lead "A" to 380-415 Terminal.

220 or 230 VAC  
(Codes 11366)

1. Open reconnect panel access door on wraparound.
2. Move input voltage switch to Voltage = 200 -230V position.
3. Move lead "A" to 220-230 Terminal.

200 or 208 VAC  
(Codes 11366)

1. Open reconnect panel access door on wraparound.
2. Move input voltage switch to Voltage = 200 -230V position.
3. Move lead "A" to 200-208 Terminal.

200 or 208 VAC  
(Codes 11367)

1. Open reconnect panel access door on wraparound.
2. Move input voltage switch to Voltage = 200 -230V position.
3. Move lead "A" to 200-208 Terminal.

## OUTPUT CONNECTIONS

### WIRE FEEDER OUTPUT CONNECTIONS

Refer to the Accessories section of this manual for instructions on connecting a wire feeder to the INVERTEC STT II (CE).

The LN-742 or STT-10 wire feeder is the recommended feeder for use with the INVERTEC STT II (CE).

INVERTEC STT II (CE)



## OPERATING INSTRUCTIONS

Read and understand entire section before operating machine.

### GENERAL WARNINGS

### SAFETY PRECAUTIONS

#### WARNING



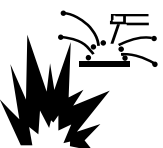
#### **ELECTRIC SHOCK** can kill.

- Do not touch electrically live parts or electrode with skin or wet clothing.
- Insulate yourself from work and ground.
- Always wear dry insulating gloves.



#### **FUMES AND GASES** can be dangerous.

- Keep your head out of fumes.
- Use ventilation or exhaust to remove fumes from breathing zone.



#### **WELDING SPARKS** can cause fire or explosion

- Keep flammable material away.
- Do not weld on containers that have held combustibles.



#### **ARC RAYS** can burn.

- Wear eye, ear and body protection.

Observe additional Safety Guidelines detailed in the beginning of this manual.

## GENERAL DESCRIPTION

The INVERTEC STT II (CE) is a 225-ampere inverter based arc welding power source specifically designed for the STT welding process. It is neither a constant current (CC) nor a constant voltage (CV) machine. It is a power source that delivers current of a desired wave form and characteristics that are superior to conventional short circuiting GMAW. The process is optimized for short-circuiting GMAW welding.



## RECOMMENDED EQUIPMENT

The LN-742 or STT-10 wire feeder is recommended for use with the STT II. The LN-7 GMA, LN-9 GMA, NA-5, and NA-5R can all be used with the STT II. However, these units can only be used to feed wire since these feeders have no provision for control of the STT output.

## OPERATING CONTROLS

The INVERTEC STT II (CE) has the following controls as standard: On/Off switch, Peak Current adjustment, Background Current adjustment, Hot Start adjustment, Tailout, and 2 toggle switches; one for wire size selection and one for wire type selection.

## DESIGN FEATURES AND ADVANTAGES

- State of the art inverter technology yields high power efficiency, excellent welding performance, lightweight and compact design.
- Twist-Mate™ output terminals.
- Digital meters for procedure settings are standard.
- Automatic Inductance or Pinch Control.
- Solid state circuitry for extra long component life.
- Current feedback ensures that original procedure settings all remain constant.
- Arc Sense lead assembly (Electrode and Work), connects through a 4-pin case front connector.
- Peak Current and Background Current may be remotely controlled.
- Thermostat and FET over current protector prevent overheating from overloads, high ambient temperatures, or loss of air flow.

- High temperature Class H insulation.
- Protection circuits and ample safety margins prevent damage to the solid state components from transient voltages and high currents.
- Preset welding current capability.
- STT II offers improvements over the previous model. Approximately 40% increase in deposition rate capability, and a significant increase in travel speed.

## WELDING CAPABILITY

The INVERTEC STT II (CE) is rated at 225 amps, 29 volts, at 60% duty cycle on a ten minute basis. It is capable of higher duty cycles at lower output currents. If the duty cycle(s) are exceeded, a thermal protector will shut off the output until the machine cools to a reasonable operating temperature.

## LIMITATIONS

- May not be suitable for use in an environment with High Frequency present. ("See Machine Grounding and High Frequency Protection" in the Installation section of this manual)
- Suitable for indoor use only (IEC IP21S).

## OPERATIONAL FEATURES AND CONTROLS

All operator controls are located on the case front of the INVERTEC STT II (CE). Refer to Figure B.1 for locations.

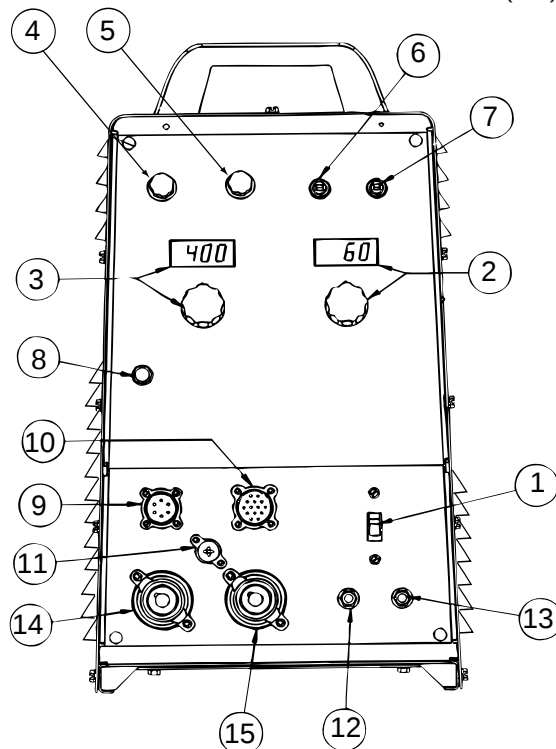
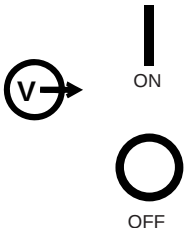


FIGURE B.1 CASE FRONT CONTROLS

1. **POWER SWITCH:** Turns output power ON and OFF. This switch also controls auxiliary power available through the 14-pin Wire Feeder Receptacle. 
- 2A. **BACKGROUND CURRENT OUTPUT CONTROL:** The output current is switched to the Background level at the conclusion of the preceding Peak Current pulse. This knob allows preset adjustment of the amplitude of the background current up to 125 amperes. 
- 2B. **BACKGROUND CURRENT DISPLAY METER:** This is a digital meter for displaying the preset Background Current. This meter displays in 1 amp increments. This meter does not indicate the actual welding current, only the preset current. 
- 3A. **PEAK CURRENT OUTPUT CONTROL:** The beginning portion of the welding arc is a pulse of current referred to as Peak Current. This knob allows preset adjustment of the amplitude of the peak current up to 450 amperes. 
- 3B. **PEAK CURRENT DISPLAY METER:** This is a digital meter for displaying the preset Peak Current. This meter displays in 1 amp increments. This meter does not indicate actual welding current only the preset current. 
4. **HOT START CONTROL POTENTIOMETER:** "Hot Start" provides approximately 25% to 50% more current during the initial start of the weld for improved arc starting and bead appearance. This control adjusts the duration of this "Hot Start" current. The control range is from 0 to 10, where 0 corresponds to the zero or no "Hot Start", and 10 is maximum for a "Hot Start" lasting for about four (4) seconds. 
5. **TAILOUT:** Alters the current waveform to increase deposit rate and travel speed. The Minimum setting sets STT II to the original STT waveform. As tailout is increased peak and Background current may need to be reduced to maintain optimum performance.

INVERTEC STT II (CE)



6. **WIRE SIZE SELECT SWITCH:** This toggle switch selects between electrode diameters of .035" (1 mm) and smaller or .045" (1.2 mm) and larger. The .035" (1 mm) position provides improved performance of smaller diameter wires at higher wire feed speeds.

7. **WIRE TYPE SELECT SWITCH:** This toggle switch selects between mild or stainless steel. In the stainless position, the pulse width of the Peak Current is changed from 1 to 2 ms for better performance for stainless steel welding.

8. **THERMAL SHUT-DOWN INDICATOR:** This light will indicate that either the internal thermostat(s) or the FET over current sensor has actuated. Machine output will return after the internal components have returned to normal operating temperature (if the thermostat(s) "opened") or after about 3-7 seconds (if the FET over current sensor activated).



9. **REMOTE RECEPTACLE:** This is a 10 pin MS-type connector for remote control of Peak Current and Background Current. Trigger switch connections are also provided. The presence of the mating connector is automatically sensed, disabling the front panel Peak and Background Current controls. Refer to "REMOTE CONTROL CONNECTOR" in the ACCESSORIES Section of this manual for more information.



10. **WIRE FEEDER RECEPTACLE:** This is 14 pin MS-type connector for the wire feeder connection. 115 and 42 VAC along with the trigger switch connections are provided. (Only 42 VAC is available on European models). There are no provisions for voltage control of the power source by the wire feeder. Refer to the Accessories section of this manual for wire feeder connection instructions.



11. **ARC SENSE RECEPTACLE:** This is a four pin MS-type connector for WORK and ELECTRODE sense leads. The STT requires a WORK sense and ELECTRODE sense lead for proper operation. The ELECTRODE sense lead is bolted together with power source electrode lead at the wire feeder gun block. The WORK sense lead is furnished with an "alligator" type clip for connection to the work piece. Refer to the LN 742 or STT-10 wire feeder connection instructions in the Accessories section of this manual for proper connection of these leads.

12. **42V AUXILIARY POWER CIRCUIT BREAKER:** The 42 VAC supply is protected from excessive current draws with a 6 amp circuit breaker. When the breaker "trips" its button will extend. Depressing this button will reset the breaker.



13. **115V AUXILIARY POWER CIRCUIT BREAKER** (Not on European Models): The 115 VAC supply is protected from excessive current draws with a 6 amp circuit breaker. When the breaker "trips" its button will extend. Depressing this button will reset the breaker.



14. **WORK TERMINAL:** This twist-mate connection is the negative output terminal for connecting a work cable and clamp to the workpiece.



15. **ELECTRODE TERMINAL:** This twist-mate connection is the positive output terminal for connecting an electrode cable to the wire feeder conductor block. Refer to the Accessories Section for wire feeder connection instructions.



## WELDING OPERATION

Familiarize yourself with the controls on the INVERTEC STT II (CE) before beginning to weld.

Familiarize yourself with the operating manual for the wire feeder and the wire feeder controls before beginning to weld.

Set the Wire Size and Wire Type selection switches per the appropriate wire. Refer to "Operational Features and Controls" in this section for the function of these switches.

## WELDING PARAMETERS AND GUIDELINES

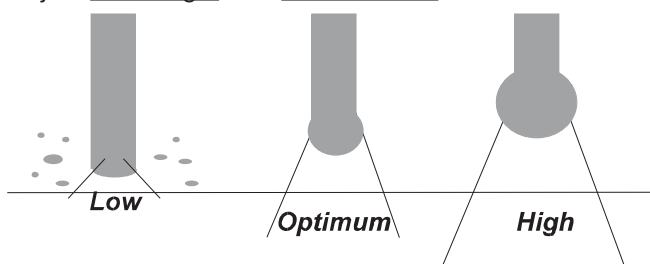
The INVERTEC STT II (CE) is neither a constant current (CC) nor a constant voltage (CV) power source. In general, wire diameter will be increased one size compared to conventional (CV) power sources. The larger the wire diameter the higher the deposition rate (Up to 1/16"). Wire sizes below .035" are unnecessary for most applications. The INVERTEC STT II (CE) is a current controlled machine which is capable of changing the electrode current quickly in order to respond to the instantaneous requirements of the arc and optimize performance. By sensing changes in welding current, and hence the electrode state, the power source will supply varying output currents to minimize spatter. The Peak and Background currents are two such current outputs that can be adjusted.

Wire Feed Speed controls the deposition rate. Peak Current controls the Arc Length. Background Current controls the Bead Contour. And Tailout increases Power in the Arc.

### PEAK CURRENT

The Peak Current control acts similar to an "arc pinch" control. Peak current serves to establish the arc length and promote good fusion. Higher peak current levels will cause the arc to broaden momentarily while increasing the arc length. If set too high, globular type transfer will occur. Setting this level to low will cause instability and wire stubbing. In practice, this current level should be adjusted for minimum spatter and puddle agitation.

Adjust Arc Length with Peak Current



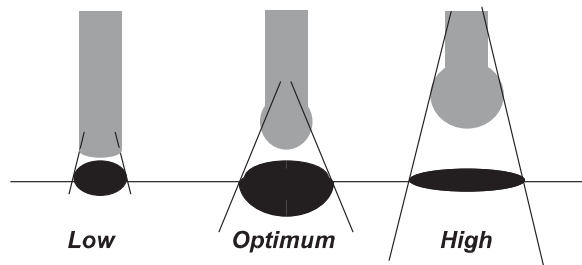
Note: In 100% CO<sub>2</sub> shielding gas applications the peak current level should be set greater than in a corresponding application using a gas blend with a high percentage of Argon. Longer initial arc lengths with 100% CO<sub>2</sub> are required to reduce spatter.

### BACKGROUND CURRENT

The Background Current provides the control for the overall heat input to the weld. Adjusting this level too high will cause a large droplet to form and globular type transfer to occur resulting in increased spatter.

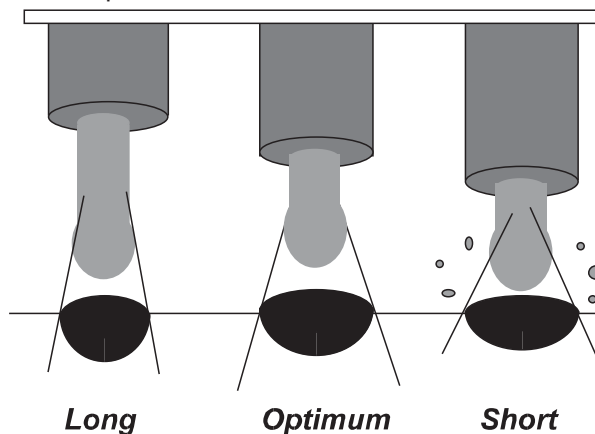
Adjusting this level to low will cause wire stubbing and also poor wetting of the weld metal. This is similar to a low voltage setting on a standard CV machine

Adjust Bead Shape using Background Current



Note: Background Current levels for applications using 100% CO<sub>2</sub> is less than similar procedures involving gas blends with high percentages of Argon. This is a result of the greater heat generated in the 100% CO<sub>2</sub> arc. (100% CO<sub>2</sub> is 35 volts/cm and 100% Argon is 20 volts/cm. 75% Argon, 25% CO<sub>2</sub> is about 24 volts/cm.

Contact Tip to Work Distance



### HOT START

The Hot Start control can be set to enhance establishing the arc and provide the capability of increasing the heat at the start of the weld to compensate for a cold work piece. Hot start adjusts the time that additional current is applied during the starting of the arc. Refer to "Operational Features and Controls" in this section for a description of this control.

### TAILOUT

The tail out provides additional heat without the molten droplet becoming too large. Increase as necessary to add "Heat" to the arc without increasing arc length. (This will allow for faster travel speeds and produce improved wetting). As tailout is increased, the peak and/or background current is usually reduced.

### WELDING ARC PERFORMANCE

For optimum spatter reduction, the arc should be concentrated on the puddle.

### WELDING PROCEDURES FOR STT II - (Steel) Horizontal Fillet (See Table B.1 and B.2)

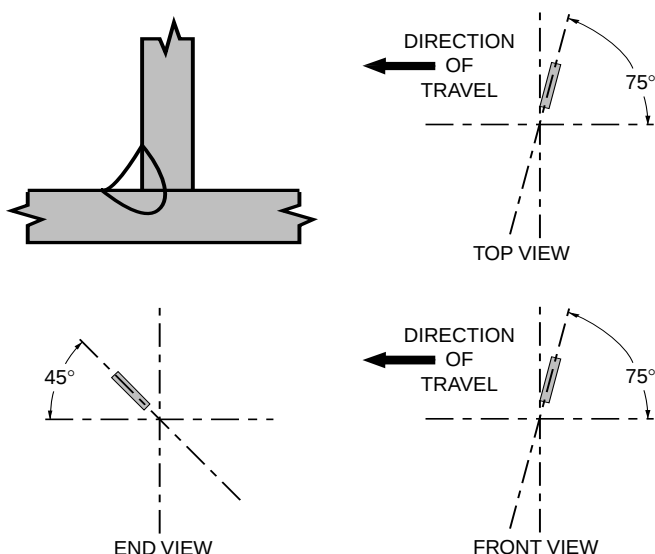


Table B.1

#### 100% CO<sub>2</sub> Gas Shield (Set for Steel Mode)

|                               |                         |                |                 |
|-------------------------------|-------------------------|----------------|-----------------|
| Plate Thickness " (mm)        | 20 ga<br>(0.9)          | 14 ga<br>(2.0) | 10 ga<br>(3.25) |
| Electrode size " (mm)         | 0.035<br>(0.9)          | 0.045<br>(1.1) | 0.045<br>(1.1)  |
| WFS "/min (m/min)             | 100<br>(2.5)            | 100<br>(2.5)   | 170<br>(4.2)    |
| Peak Current                  | 220                     | 260            | 280             |
| Background Current            | 30                      | 40             | 65              |
| Tailout setting               | 3                       | 7              | 5               |
| Average Amperage              | 60                      | 105            | 120             |
| Travel Speed "/min<br>(m/min) | 12<br>(0.3)             | 12<br>(0.3)    | 12<br>(0.3)     |
| Gas Flow cfh (L/min)          | 25 (12)                 |                |                 |
| Electrical Stickout "<br>(mm) | 1/4 - 3/8<br>(6.4 - 10) |                |                 |

Table B.2

#### 75% CO<sub>2</sub> - 25% Ar Gas Shield (Set for Steel Mode)

|                               |                         |                |                 |
|-------------------------------|-------------------------|----------------|-----------------|
| Plate Thickness " (mm)        | 20 ga<br>(0.9)          | 14 ga<br>(2.0) | 10 ga<br>(3.25) |
| Electrode size " (mm)         | 0.035<br>(0.9)          | 0.045<br>(1.1) | 0.045<br>(1.1)  |
| WFS "/min (m/min)             | 100<br>(2.5)            | 100<br>(2.5)   | 120<br>(3.0)    |
| Peak Current                  | 225                     | 270            | 310             |
| Background Current            | 40                      | 65             | 70              |
| Tailout setting               | 8                       | 4              | 6               |
| Average Amperage              | 70                      | 110            | 130             |
| Travel Speed "/min<br>(m/min) | 12<br>(0.3)             | 12<br>(0.3)    | 12<br>(0.3)     |
| Gas Flow cfh (L/min)          | 25 (12)                 |                |                 |
| Electrical Stickout "<br>(mm) | 1/4 - 3/8<br>(6.4 - 10) |                |                 |

### (Stainless Steel) Horizontal Fillet (See Table B.3 and B.4)

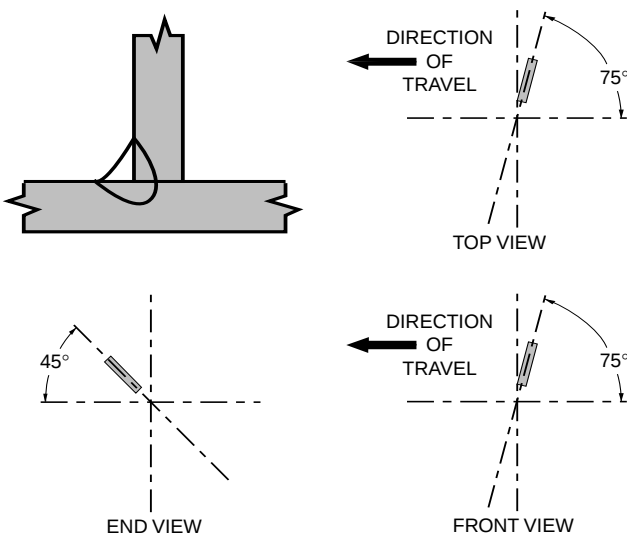


Table B.3

#### 90% He, 7.5% Ar, 2.5% CO<sub>2</sub>

#### Gas Shield (Set for Steel Mode)

|                               |                         |                |                 |
|-------------------------------|-------------------------|----------------|-----------------|
| Plate Thickness " (mm)        | 20 ga<br>(0.9)          | 14 ga<br>(2.0) | 10 ga<br>(3.25) |
| Electrode size " (mm)         | 0.035<br>(0.9)          | 0.045<br>(1.1) | 0.045<br>(1.1)  |
| WFS "/min (m/min)             | 100<br>(2.5)            | 130<br>(3.3)   | 170<br>(4.2)    |
| Peak Current                  | 165                     | 210            | 250             |
| Background Current            | 35                      | 60             | 85              |
| Tailout setting               | 7                       | 7              | 4               |
| Average Amperage              | 40                      | 95             | 120             |
| Travel Speed "/min<br>(m/min) | 12<br>(0.3)             | 16<br>(0.4)    | 16<br>(0.4)     |
| Gas Flow cfh (L/min)          | 25 (12)                 |                |                 |
| Electrical Stickout "<br>(mm) | 1/4 - 3/8<br>(6.4 - 10) |                |                 |

Table B.4

#### 98% Ar, 2% O<sub>2</sub>

#### Gas Shield (Set for Stainless Steel Mode)

|                               |                         |                |                 |
|-------------------------------|-------------------------|----------------|-----------------|
| Plate Thickness " (mm)        | 20 ga<br>(0.9)          | 14 ga<br>(2.0) | 10 ga<br>(3.25) |
| Electrode size " (mm)         | 0.035<br>(0.9)          | 0.045<br>(1.1) | 0.045<br>(1.1)  |
| WFS "/min (m/min)             | 100<br>(2.5)            | 130<br>(3.3)   | 170<br>(4.2)    |
| Peak Current                  | 145                     | 190            | 280             |
| Background Current            | 45                      | 95             | 95              |
| Tailout setting               | 7                       | 8              | 7               |
| Average Amperage              | 60                      | 120            | 150             |
| Travel Speed "/min<br>(m/min) | 12<br>(0.3)             | 12<br>(0.3)    | 12<br>(0.3)     |
| Gas Flow cfh (L/min)          | 25 (12)                 |                |                 |
| Electrical Stickout "<br>(mm) | 1/4 - 3/8<br>(6.4 - 10) |                |                 |

## OPTIONS / ACCESSORIES

**K940 SENSE LEADS:** These leads are used to accurately sense arc voltage. One set is required for each STT II power source. A 10 ft and 25 ft set are provided as standard with the machine. Additional sets are available in 10 ft (K940-10), 25 ft (K940-25) and 50 ft (K940-50) lengths.

**K942-1 REMOTE CONTROL:** Allows remote adjustment of Peak and Background Current settings.

**REMOTE RECEPTACLE (For optional remote interface, Connection to the STT-10 Wire Feeder or Robotic Control)**

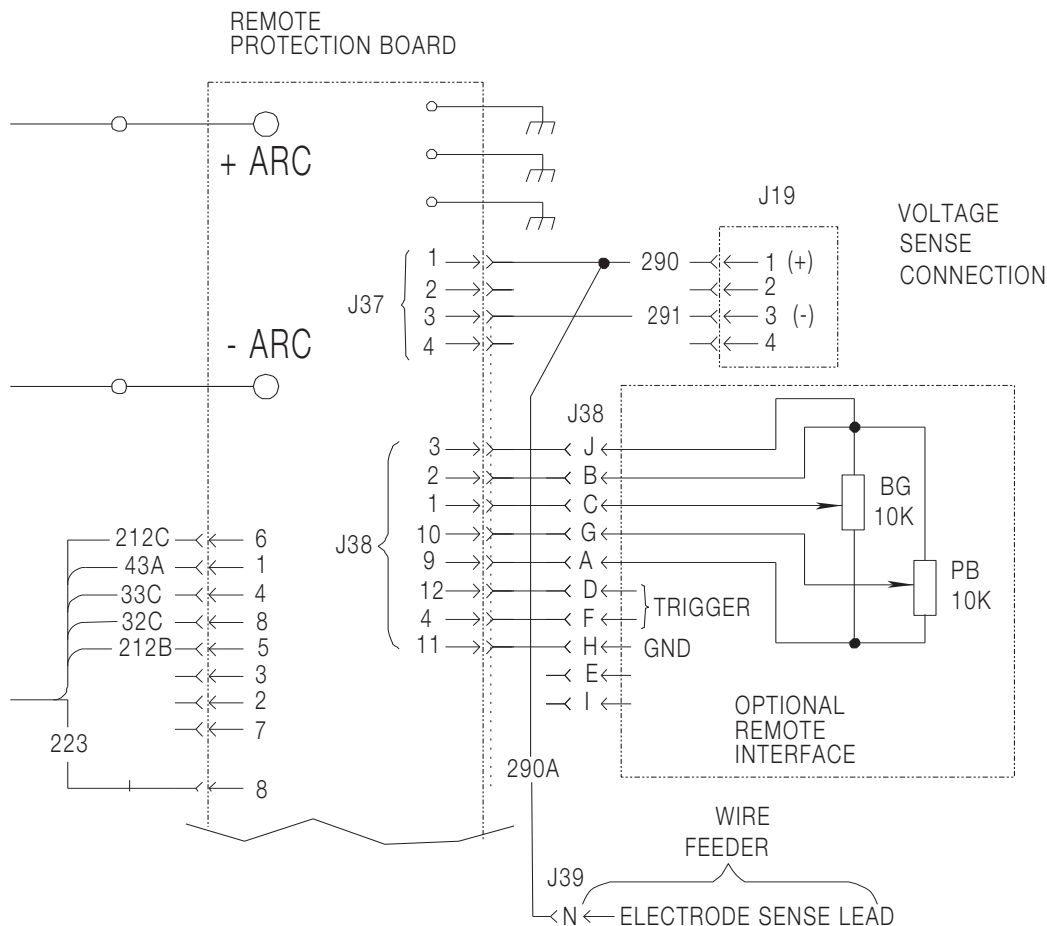
1. The 10 pin MS connector labeled "Remote Control" located on the front panel of the STT is used for remote control of the power source. Control for the PEAK (PB pot) and BACKGROUND (BG pot) current along with the trigger switch is provide through this connector.
2. Refer to figure C.1 below for details about the remote receptacle (J38). Note that pins "J" and "B" are shorted together. This "short circuit" tells the

STT control board to accept PEAK and BACKGROUND inputs on this connector rather than from the front panel controls. If this short is removed, the front panel controls will be active. By adding a switch between pins "J" and "B" a "LOCAL/REMOTE" control switch can be created. (Switch open for "local" and closed for "remote")

3. For robotic control of the PEAK CURRENT, a 0 to +10 volt DC signal is applied between pins "A" and "G" with + applied to pin "G". The BACKGROUND CURRENT is controlled with a similar signal applied between pins "A" and "C" with + applied to pin "C". In this application pins "J" and "B" must be shorted as described in 2 above.

**NOTE: These analog signals should be isolated from the robot circuitry to prevent interference.**

4. The trigger switch is connected between pins "D" and "F". These connections are in parallel with the trigger switch from the wire feeder.
5. The digital meters for PEAK and BACKGROUND currents will show preset values in both local and remote operation.



PORTION OF G3136 WIRING DIAGRAM  
REFER TO ACTUAL DIAGRAM PASTED INSIDE YOUR MACHINE

INVERTEC STT II (CE)



## LN-742 or STT-10 WIRE FEEDER CONNECTION INSTRUCTIONS

The LN-742 or STT-10 is the recommended wire feeder for use with the INVERTEC STT II (CE). Refer to the LN-742 or STT-10 Operator Manual for Wire Feed Operation. Refer to Figure C.2 or C.3 and follow the instructions below to connect the LN-742 or STT-10.

### ⚠ WARNING



#### ELECTRIC SHOCK can kill.

- Only qualified personnel should perform this installation.
- Turn the input power OFF at the disconnect switch or fuse box before connecting the wire feeder

1. Turn the INVERTEC STT II (CE) power off.
2. Connect the ARC SENSE LEAD MS connector to the mating connector on STT II front panel.

3. Connect the electrode lead (Twist-Mate) to (+) output terminal on STT II.
4. Connect the other end of electrode lead (Step #3) and the ARC SENSE LEAD (lead with ring lug, step #2) together to the gun block on the LN 742.
5. Connect work lead between STT (-) terminal and the work piece.
6. Connect the ARC SENSE LEAD "WORK" (lead with alligator clip) to work piece.

**NOTE: For best welding performance make this connection as close as possible to the welding arc.**

7. Connect the wire feeder control cable between the LN-742 or STT-10 and the 14-pin Wire Feeder Receptacle on the STT II. For the STT-10 Wire Feeder: Connect the second wire feeder control cable between the STT-10 and the 10-pin Remote Receptacle on the STT II.

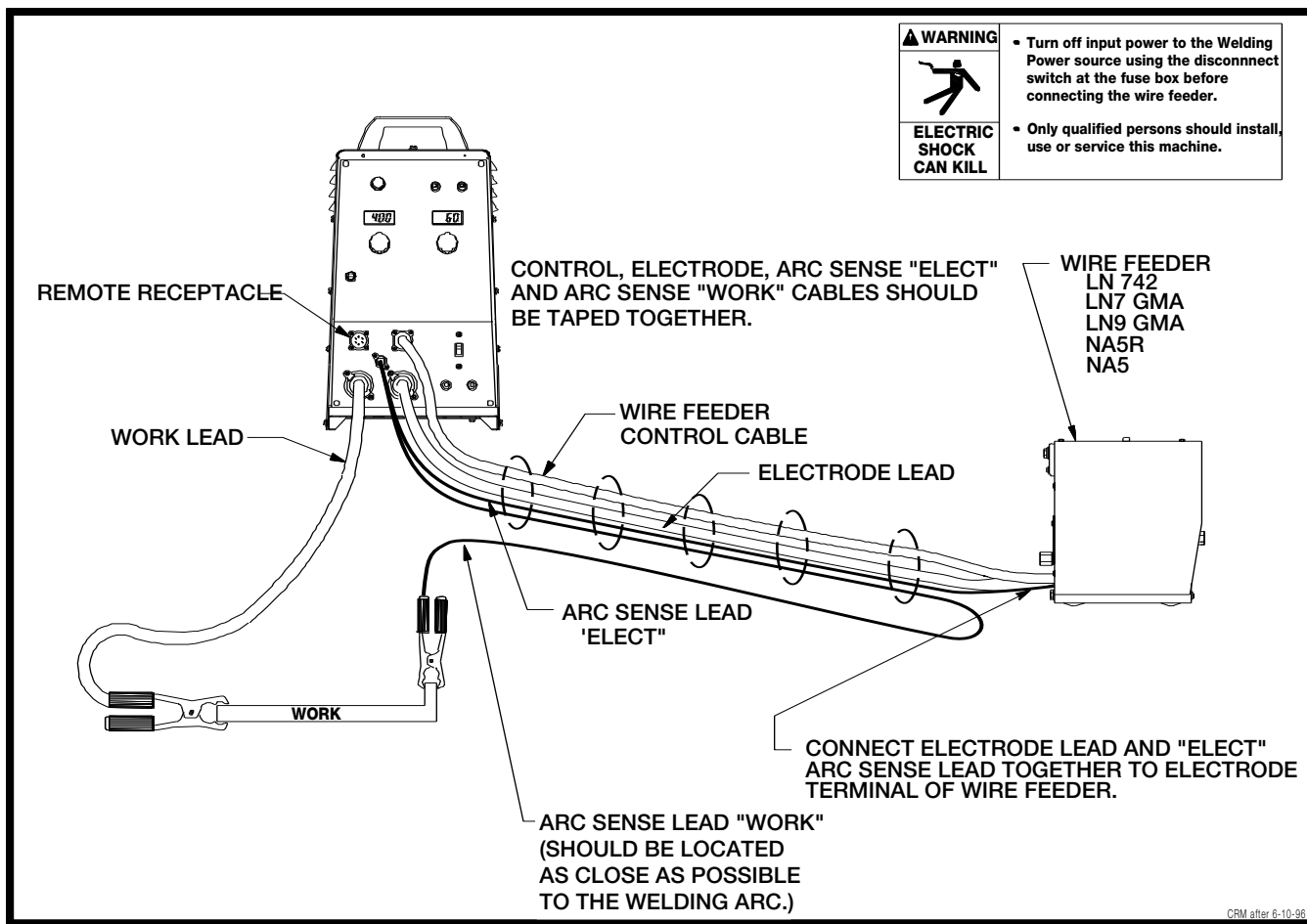


FIGURE C.2 LN-742 to STT II CONNECTION

INVERTEC STT II (CE)



## CONNECTION DIAGRAM - INVERTEC STT II

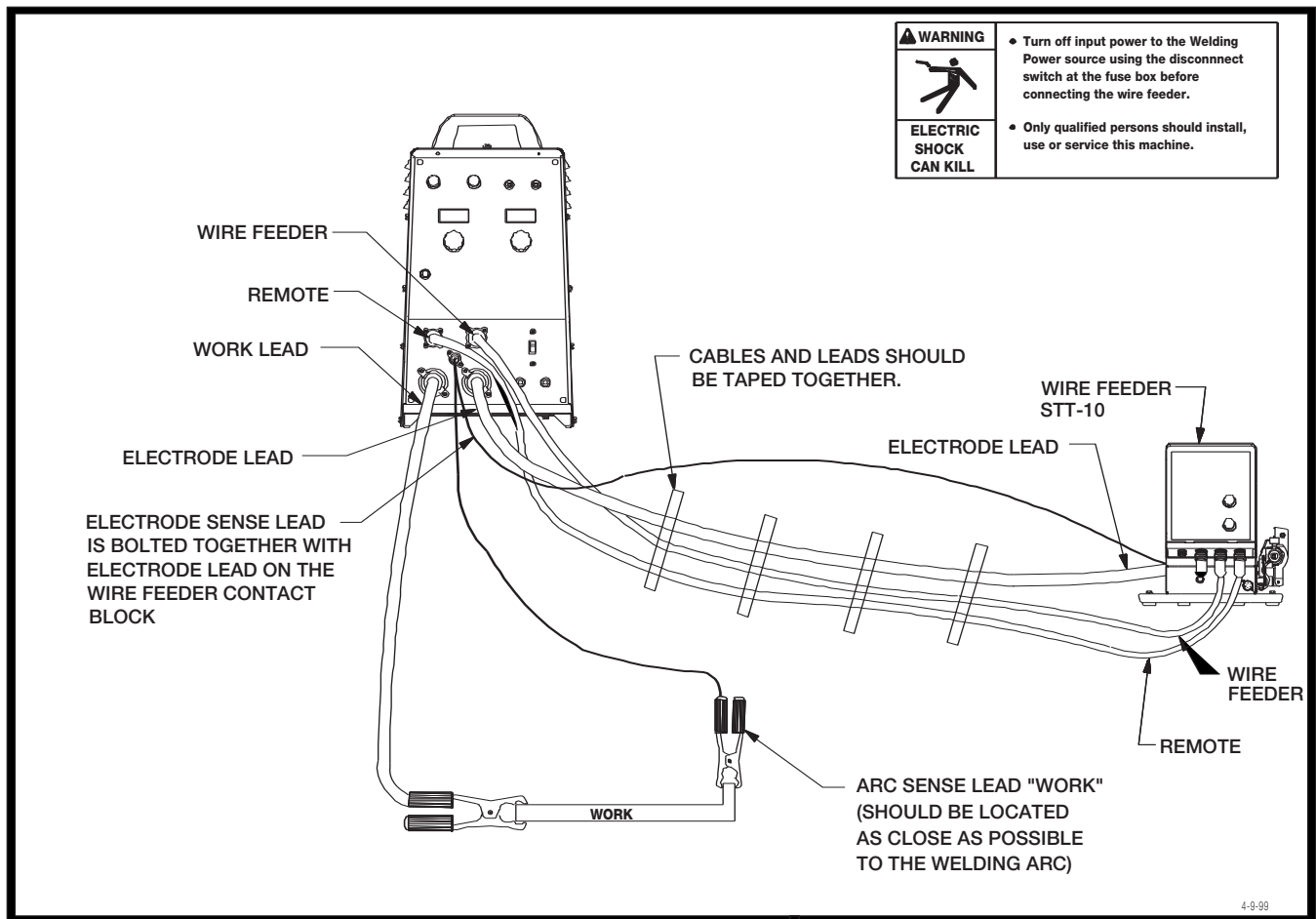


FIGURE C.3 STT-10 to STT II CONNECTION

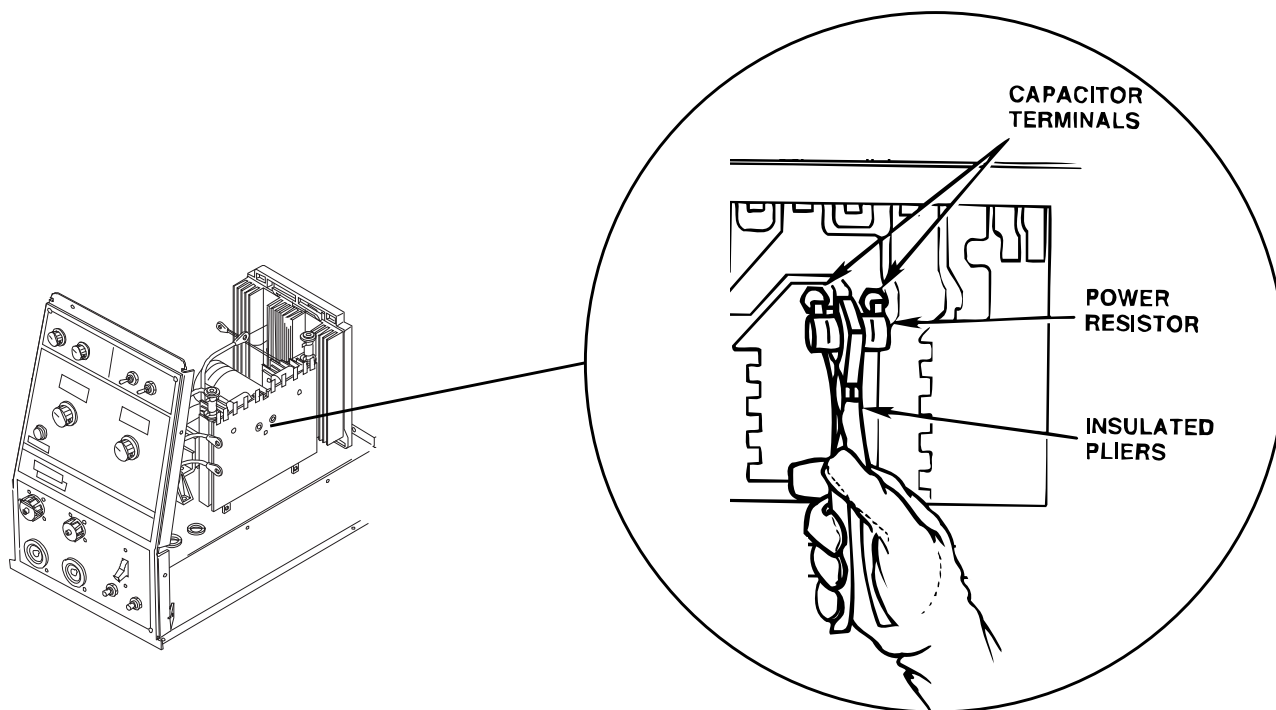
**WARNING**

Failure to follow this capacitor discharge procedure can result in electric shock.

**INPUT FILTER CAPACITOR DISCHARGE PROCEDURE**

1. Turn off input power or disconnect input power lines.
2. Remove hex head screws from side and top of machine and remove wrap-around machine cover.
3. Be careful not to make contact with the capacitor terminals that are located in the center of the Switch Boards.
4. Obtain a high resistance and high wattage resistor (25-1000 ohms and 25 watts minimum). This resistor is not supplied with machine. **NEVER USE A SHORTING STRAP FOR THIS PROCEDURE.**
5. Locate the two capacitor terminals (large hex head cap screws) shown in Figure D.1.
6. Use safety glasses, electrically insulated gloves and insulated pliers. Hold body of the resistor and connect resistor leads across the two capacitor terminals. Hold resistor in place for 10 seconds. **DO NOT TOUCH CAPACITOR TERMINALS WITH YOUR BARE HANDS.**
7. Repeat discharge procedure for capacitor on other side of machine.
8. Check voltage across terminals of all capacitors with a DC voltmeter. Polarity of capacitor terminals is marked on PC board above terminals. Voltage should be zero. If any voltage remains, repeat this capacitor discharge procedure.

**FIGURE D.1 — LOCATION OF INPUT FILTER CAPACITOR TERMINALS.**



## PREVENTIVE MAINTENANCE

1. Perform the following preventive maintenance procedures at least once every six months. It is good practice to keep a preventive maintenance record; a record tag attached to the machine works best.
2. Remove the machine wraparound cover and perform the input filter capacitor discharge procedure (detailed at the beginning of this chapter).
3. Clean the inside of the machine with a low pressure airstream. Be sure to clean the following components thoroughly.
  - Power Switch, Driver, Protection, and Control printed circuit boards
  - Power Switch
  - Main Transformer
  - Input Rectifier
  - Heat Sink Fins
  - Input Filter Capacitors
  - Output Terminals
  - Lower base compartment
4. Examine capacitors for leakage or oozing. Replace if needed.
5. Examine wraparound cover for dents or breakage. Repair as needed. Cover must be kept in good condition to assure high voltage parts are protected and correct spacings are maintained.
6. Check electrical ground continuity. Using an ohmmeter, measure resistance between either output stud and an unpainted surface of the machine case. Meter reading should be 500,000 ohms or more. If meter reading is less than 500,000 ohms, check for electrical components that are not properly insulated from the case. Correct insulation if needed.
7. Replace machine cover and screws.

## HOW TO USE TROUBLESHOOTING GUIDE

### WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

#### **Step 1. LOCATE PROBLEM (SYMPTOM).**

Look under the column labeled “PROBLEM (SYMPTOMS)”. This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

#### **Step 2. POSSIBLE CAUSE.**

The second column labeled “POSSIBLE CAUSE” lists the obvious external possibilities that may contribute to the machine symptom.

#### **Step 3. RECOMMENDED COURSE OF ACTION**

This column provides a course of action for the Possible Cause, generally it states to contact your local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact your local Lincoln Authorized Field Service Facility.

### CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe Safety Guidelines detailed in the beginning of this manual.

| PROBLEMS<br>(SYMPTOMS)                                                                                                         | POSSIBLE<br>CAUSE                                                                                                                                                                                                                                                                                                                                                                                                                                                     | RECOMMENDED<br>COURSE OF ACTION                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OUTPUT PROBLEMS</b>                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                     |
| Major physical or electrical damage is evident                                                                                 | 1. Contact your local <b>Lincoln Authorized Field Service Facility</b> .                                                                                                                                                                                                                                                                                                                                                                                              | If all recommended possible areas of misadjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b> |
| Machine has no open circuit voltage. Wire feeds ok.                                                                            | 1. Check the control cable between the feeder and the STT II unit. Make sure the #2 and #4 leads are intact.<br><br>2. Put a jumper wire between Pins "C" and "D" on the 14 pin MS connector. If normal open circuit voltage (85VDC.) is restored then the problem is in feeder control cable or the wire feeder.                                                                                                                                                     |                                                                                                                                                                     |
| Machine has no welding output (no open circuit voltage) and the wire feeder does not feed wire when the gun trigger is pulled. | 1. The 42VAC circuit breaker CB1 may be tripped. Reset if necessary.<br><br>2. Put a jumper between pins "A" and "C" on the 5 pin MS connector located on the LN742 wire feeder. If wire feeds check the gun trigger. Repair or replace if necessary.<br><br>3. Check for the presence of 42AC at pins "K" and "I" on the 14 pin MS connector. If the 42VAC is present and the feeder does not work the problem is in the feeder control cable(s) or the wire feeder. |                                                                                                                                                                     |

### CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

INVERTEC STT II (CE)



Observe Safety Guidelines detailed in the beginning of this manual.

| PROBLEMS<br>(SYMPTOMS)                                                                                                                                                        | POSSIBLE<br>CAUSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | RECOMMENDED<br>COURSE OF ACTION                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OUTPUT PROBLEMS</b>                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                            |
| No output. Main fuses open, indicating excessive current draw.                                                                                                                | <ol style="list-style-type: none"> <li>1. With input power removed inspect input leads for possible shorts or grounds or misconnections.</li> <li>2. Install new fuses and reapply power. If fuses open again contact your local Lincoln Authorized Field Service Facility.</li> </ol>                                                                                                                                                                                                                                                               | <p>If all recommended possible areas of misadjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p> |
| Machine loses output when gun trigger is pulled or arc is struck. Machine output returns after a few seconds and trigger is pulled again. The Thermal indicator light is lit. | <ol style="list-style-type: none"> <li>1. The over current sensor is being activated indicating that too much output current is being drawn from the machine. Reduce welding current demands or remove "fault" in welding cables.</li> <li>2. Make sure that the gun tip is not "shorted" to the work surface and that the proper welding procedures are being used.</li> </ol>                                                                                                                                                                      |                                                                                                                                                                            |
| Machine is dead - no output -no fans - no display.                                                                                                                            | <ol style="list-style-type: none"> <li>1. Power switch must be in the "ON" position.</li> <li>2. Check the input voltage. Make sure all three phases are applied to the machine.</li> <li>3. With input power removed check that the input voltage set-up switch and jumper "A" ( the reconnect auxiliary jumper) are in the proper position for input voltage being used. See Reconnect Procedure in the Installation Section.</li> <li>4. With input power removed check continuity of 3 amp slow blow fuse located on reconnect panel.</li> </ol> |                                                                                                                                                                            |

### CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

INVERTEC STT II (CE)



Observe Safety Guidelines detailed in the beginning of this manual.

| PROBLEMS<br>(SYMPTOMS)                                                                                                        | POSSIBLE<br>CAUSE                                                                                                                                                                                                                                                                                                                                                                                             | RECOMMENDED<br>COURSE OF ACTION                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OUTPUT PROBLEMS</b>                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                            |
| No output or reduced output the first time power is applied to the machine.                                                   | <ol style="list-style-type: none"> <li>1. Check input voltages, fuses and input voltage reconnect procedures. See Installation section.</li> <li>2. If high input voltage (380VAC or higher) is applied, the capacitors may need conditioning. Let the "unloaded" machine idle for 30 minutes.</li> </ol>                                                                                                     | <p>If all recommended possible areas of misadjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p> |
| Machine loses output while welding. The thermal indicator light is lit. Normal welding output returns after about 10 minutes. | <ol style="list-style-type: none"> <li>1. Check to make sure the fans are running and operating correctly.</li> <li>2. Welding application may exceed recommended duty cycle.</li> <li>3. Dirt and dust may have clogged the cooling channels. Blow out unit with clean, dry compressed air.</li> <li>4. Air intake and exhaust louvers may be blocked due to inadequate clearance around machine.</li> </ol> |                                                                                                                                                                            |
| Machine has low OCV, and loses output while attempting to weld.                                                               | <ol style="list-style-type: none"> <li>1. Check for faulty connection on plug J1 on Control Board and plug J1 on Current Sense Board.</li> <li>2. Check for faulty Current Sense Board.</li> </ol>                                                                                                                                                                                                            |                                                                                                                                                                            |

### CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

INVERTEC STT II (CE)



Observe Safety Guidelines detailed in the beginning of this manual.

| PROBLEMS<br>(SYMPTOMS)                                                    | POSSIBLE<br>CAUSE                                                                                                                                                                                                                                                                                                     | RECOMMENDED<br>COURSE OF ACTION                                                                                                                                            |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OUTPUT PROBLEMS</b>                                                    |                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                            |
| Excessive weld spatter. Arc sounds and looks like a standard MIG process. | <ol style="list-style-type: none"> <li>1. Check the Arc Sense leads for loose or faulty connections.</li> <li>2. Make sure the Arc Sense "WORK" lead is as close as possible to the welding arc.</li> <li>3. Make sure the machine and wire feed settings are correct for the process and wire being used.</li> </ol> | <p>If all recommended possible areas of misadjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p> |
| The wire burns back to the tip.                                           | <ol style="list-style-type: none"> <li>1. Remove P1 from the control board if the machine noodle welds, the current sense board is bad.</li> </ol>                                                                                                                                                                    |                                                                                                                                                                            |
| Poor welding, weld settings drift or output power is low.                 | <ol style="list-style-type: none"> <li>1. Make sure machine settings are correct for welding process being used.</li> <li>2. Check welding cables for loose or faulty connections.</li> </ol>                                                                                                                         |                                                                                                                                                                            |
|                                                                           |                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                            |

 **CAUTION**

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

INVERTEC STT II (CE)



Observe Safety Guidelines detailed in the beginning of this manual.

| PROBLEMS<br>(SYMPTOMS)                            | POSSIBLE<br>CAUSE                                                                                                                                                                                                                                                                                                                                                  | RECOMMENDED<br>COURSE OF ACTION                                                                                                                                            |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OUTPUT PROBLEMS</b>                            |                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                            |
| Porosity in the weld                              | <ol style="list-style-type: none"> <li>1. Make sure proper gas type and flow rate is correct for procedure being used. Shield work from excessive outside air currents.</li> <li>2. Check gun and nozzle for leaks or obstructions.</li> <li>3. Make certain machine and wire feed settings are correct for process.</li> </ol>                                    | <p>If all recommended possible areas of misadjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p> |
| Weld bead appears "cold".                         | <ol style="list-style-type: none"> <li>1. One or more of the machine settings may be wrong. Check the Background, Peak Current, Tailout and wire speed controls for proper settings. Adjust for optimum welding performance.</li> <li>2. Make sure the Wire Type, and Wire Size switches are in the correct position for the electrode wire being used.</li> </ol> |                                                                                                                                                                            |
| Molten weld puddle appears excessively "violent". | <ol style="list-style-type: none"> <li>1. The Wire Type switch may be in the wrong position for the electrode wire being used.</li> <li>2. The Peak Current setting may be too high. Adjust for optimum welding performance.</li> </ol>                                                                                                                            |                                                                                                                                                                            |

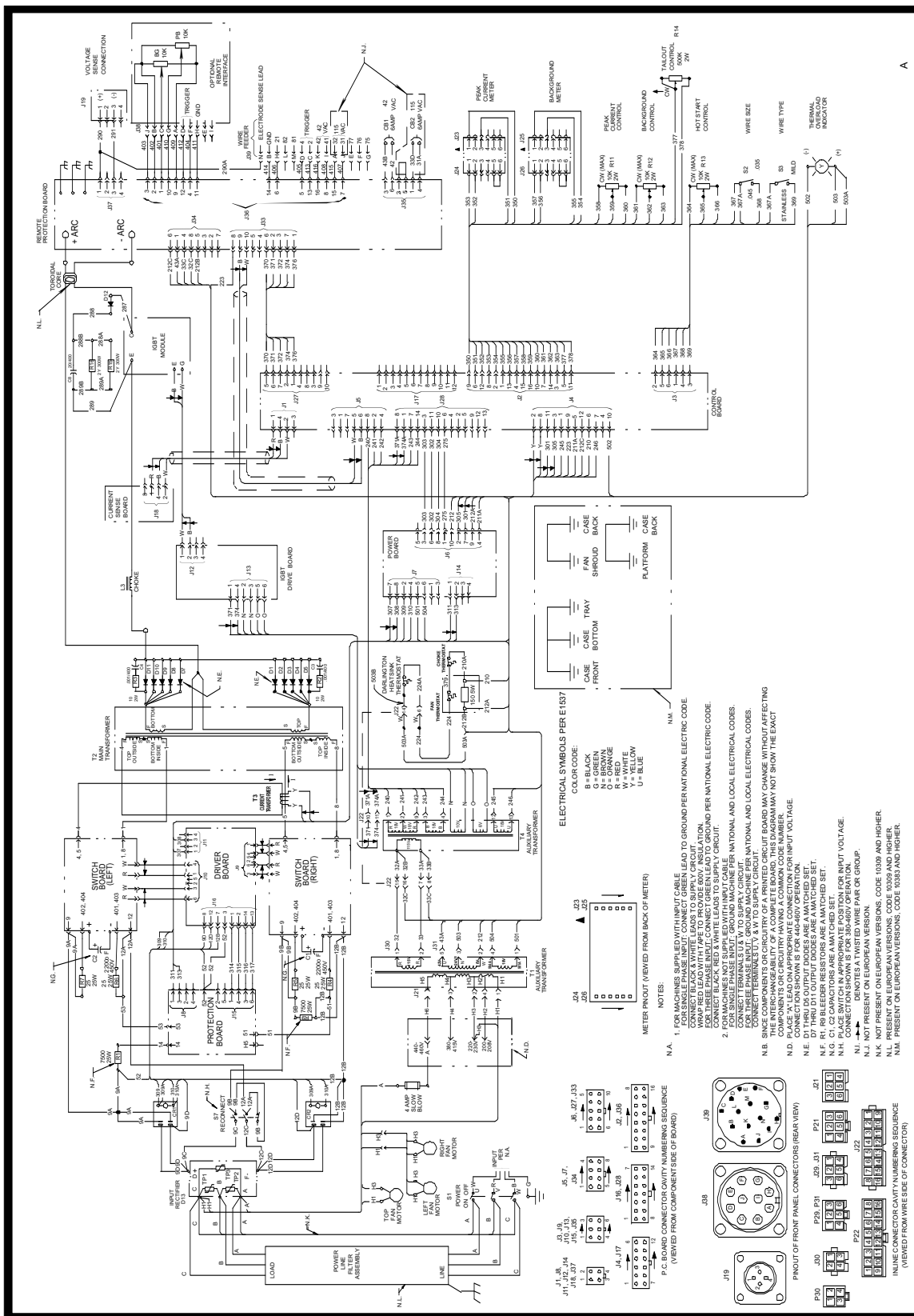
### CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

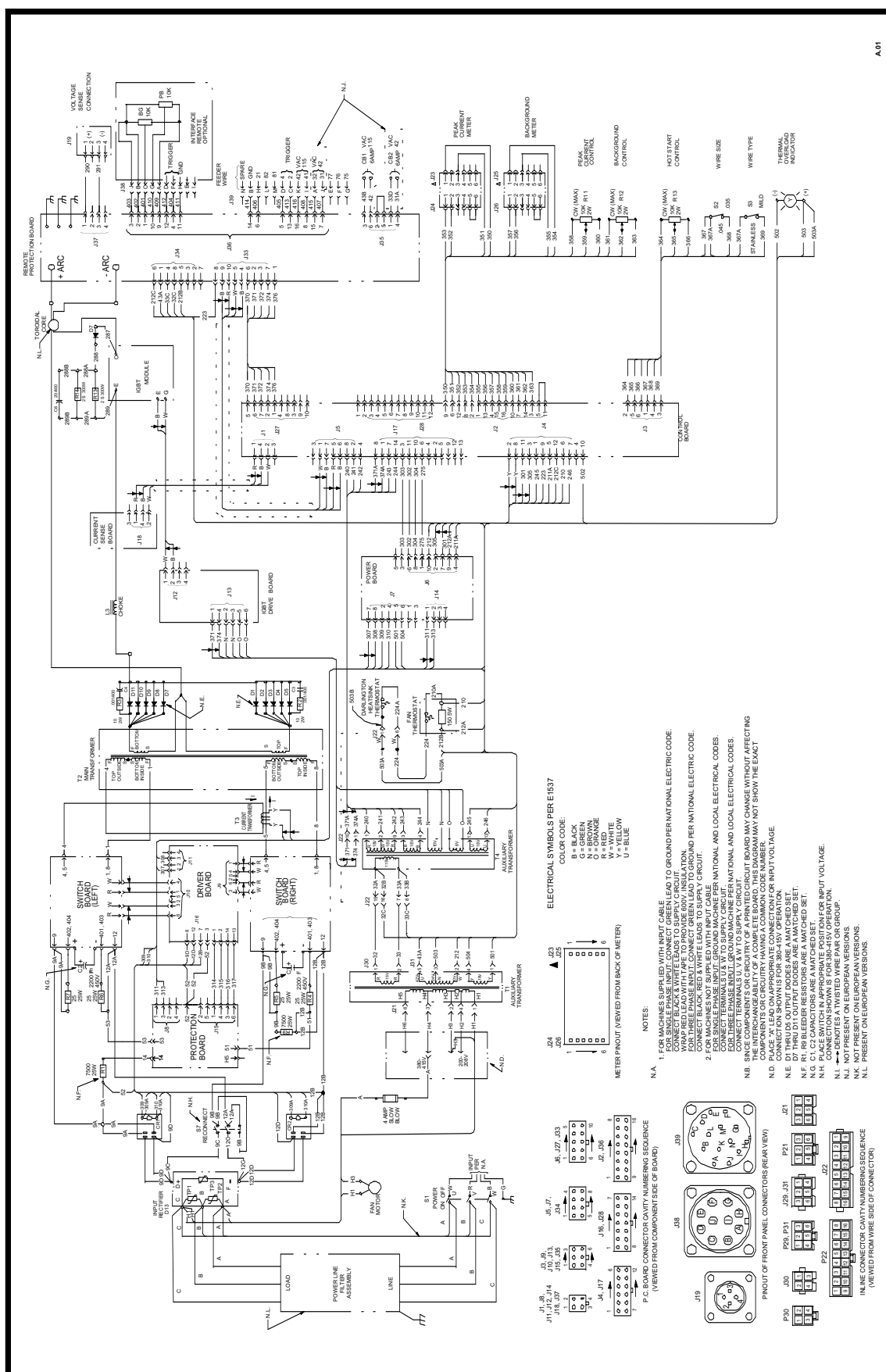
INVERTEC STT II (CE)



# WIRING DIAGRAM - INVERTEC STT II (CE) (FOR CODE 11366)



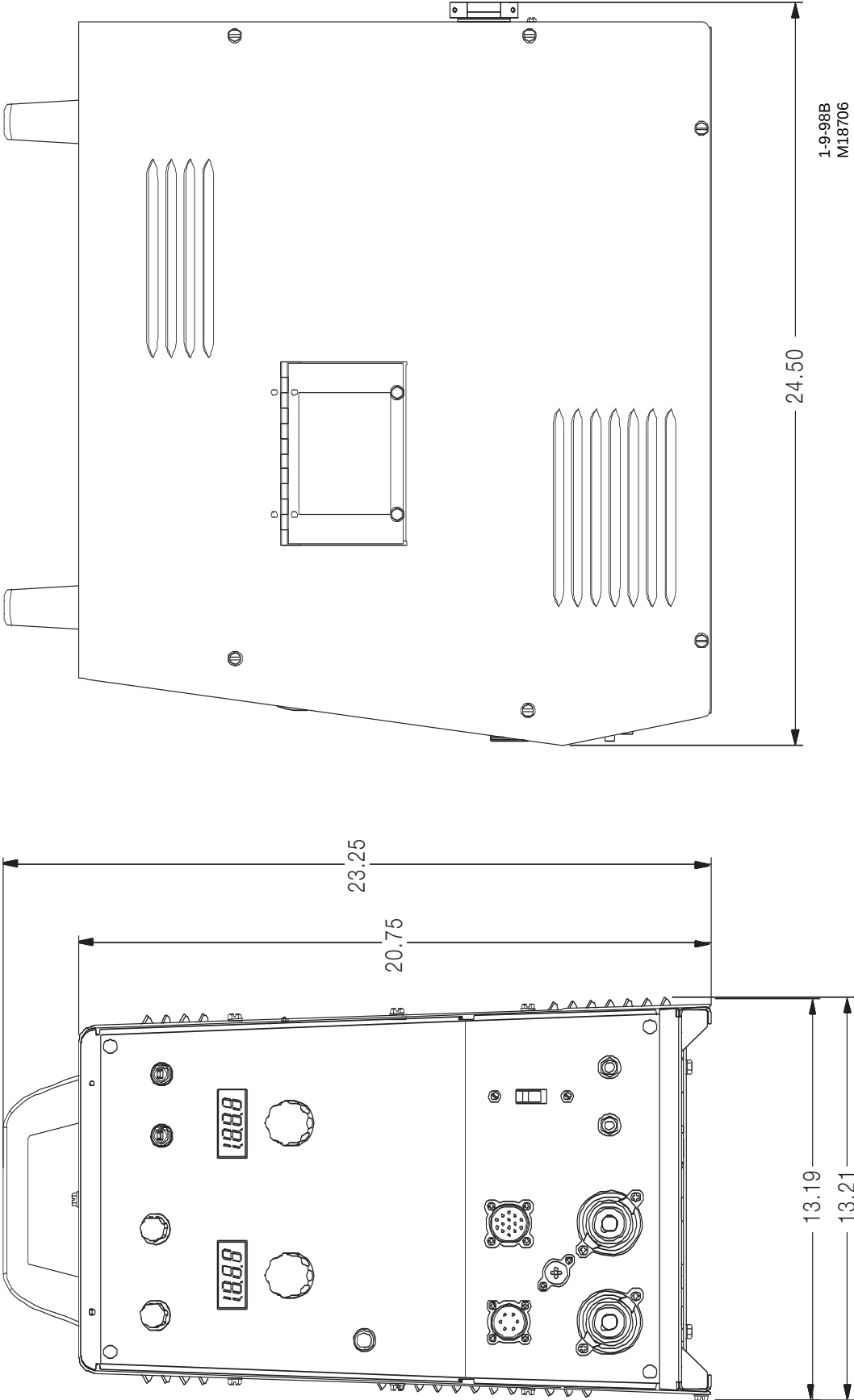
**WIRING DIAGRAM - INVERTEC STT II (CE) (FOR CODE 11367)**



**G4557**

**NOTE:** This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

DIMENSION PRINT - STT II (CE)



## NOTES

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INVERTEC STT II (CE)



## NOTES

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INVERTEC STT II (CE)



## NOTES

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INVERTEC STT II (CE)



|                                                                          |                                                                                                                                                                                                                     |                                                                                                               |                                                                                                   |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
|                                                                          |                                                                                                                                                                                                                     |                                                                                                               |                                                                                                   |
| <b>WARNING</b>                                                           | <ul style="list-style-type: none"> <li>Do not touch electrically live parts or electrode with skin or wet clothing.</li> <li>Insulate yourself from work and ground.</li> </ul>                                     | <ul style="list-style-type: none"> <li>Keep flammable materials away.</li> </ul>                              | <ul style="list-style-type: none"> <li>Wear eye, ear and body protection.</li> </ul>              |
| Spanish<br><b>AVISO DE PRECAUCION</b>                                    | <ul style="list-style-type: none"> <li>No toque las partes o los electrodos bajo carga con la piel o ropa mojada.</li> <li>Aíselese del trabajo y de la tierra.</li> </ul>                                          | <ul style="list-style-type: none"> <li>Mantenga el material combustible fuera del área de trabajo.</li> </ul> | <ul style="list-style-type: none"> <li>Protéjase los ojos, los oídos y el cuerpo.</li> </ul>      |
| French<br><b>ATTENTION</b>                                               | <ul style="list-style-type: none"> <li>Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension.</li> <li>Isolez-vous du travail et de la terre.</li> </ul>                   | <ul style="list-style-type: none"> <li>Gardez à l'écart de tout matériel inflammable.</li> </ul>              | <ul style="list-style-type: none"> <li>Protégez vos yeux, vos oreilles et votre corps.</li> </ul> |
| German<br><b>WARNUNG</b>                                                 | <ul style="list-style-type: none"> <li>Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung!</li> <li>Isolieren Sie sich von den Elektroden und dem Erdboden!</li> </ul> | <ul style="list-style-type: none"> <li>Entfernen Sie brennbares Material!</li> </ul>                          | <ul style="list-style-type: none"> <li>Tragen Sie Augen-, Ohren- und Körperschutz!</li> </ul>     |
| Portuguese<br><b>ATENÇÃO</b>                                             | <ul style="list-style-type: none"> <li>Não toque partes elétricas e electrodos com a pele ou roupa molhada.</li> <li>Isole-se da peça e terra.</li> </ul>                                                           | <ul style="list-style-type: none"> <li>Mantenha inflamáveis bem guardados.</li> </ul>                         | <ul style="list-style-type: none"> <li>Use proteção para a vista, ouvido e corpo.</li> </ul>      |
| Japanese<br>● Keep flammable materials away.                             | <ul style="list-style-type: none"> <li>通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。</li> <li>施工物やアースから身体が絶縁されている様にして下さい。</li> </ul>                                                                                                | <ul style="list-style-type: none"> <li>燃えやすいものの側での溶接作業は絶対にしてはなりません。</li> </ul>                                | <ul style="list-style-type: none"> <li>目、耳及び身体に保護具をして下さい。</li> </ul>                              |
| Chinese<br>● Mantenga el material combustible fuera del área de trabajo. | <ul style="list-style-type: none"> <li>皮膚或濕衣物切勿接觸帶電部件及鋸條。</li> <li>使你自己與地面和工件絕緣。</li> </ul>                                                                                                                         | <ul style="list-style-type: none"> <li>把一切易燃物品移離工作場所。</li> </ul>                                              | <ul style="list-style-type: none"> <li>佩戴眼、耳及身體勞動保護用具。</li> </ul>                                 |
| Korean<br>● Gardez à l'écart de tout matériel inflammable.               | <ul style="list-style-type: none"> <li>전도체나 용접봉을 젖은 형갑 또는 피부로 절대 접촉치 마십시오.</li> <li>모재와 접지를 접촉치 마십시오.</li> </ul>                                                                                                    | <ul style="list-style-type: none"> <li>인화성 물질을 접근시키지 마시오.</li> </ul>                                          | <ul style="list-style-type: none"> <li>눈, 귀와 몸에 보호장구를 착용하십시오.</li> </ul>                          |
| Arabic<br>● Entfernen Sie brennbares Material!                           | <ul style="list-style-type: none"> <li>لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجسد الجسم أو بالملابس المبللة بالماء.</li> <li>ضع عازلا على جسمك خلال العمل.</li> </ul>                        | <ul style="list-style-type: none"> <li>ضع المواد القابلة للاشتعال في مكان بعيد.</li> </ul>                    | <ul style="list-style-type: none"> <li>ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.</li> </ul>   |

**READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.**

**SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.**

**LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.**

**LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.**

|                                                                                                                                                                                               |                                                                                                                                                                                              |                                                                                                                                                                 |                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                                                                                                               |                                                                                                              |                                                                                |  |
| <ul style="list-style-type: none"> <li>● Keep your head out of fumes.</li> <li>● Use ventilation or exhaust to remove fumes from breathing zone.</li> </ul>                                   | <ul style="list-style-type: none"> <li>● Turn power off before servicing.</li> </ul>                                                                                                         | <ul style="list-style-type: none"> <li>● Do not operate with panel open or guards off.</li> </ul>                                                               | <b>WARNING</b>                                                                     |
| <ul style="list-style-type: none"> <li>● Los humos fuera de la zona de respiración.</li> <li>● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.</li> </ul> | <ul style="list-style-type: none"> <li>● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.</li> </ul>                                         | <ul style="list-style-type: none"> <li>● No operar con panel abierto o guardas quitadas.</li> </ul>                                                             | Spanish<br><b>AVISO DE PRECAUCION</b>                                              |
| <ul style="list-style-type: none"> <li>● Gardez la tête à l'écart des fumées.</li> <li>● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.</li> </ul>       | <ul style="list-style-type: none"> <li>● Débranchez le courant avant l'entretien.</li> </ul>                                                                                                 | <ul style="list-style-type: none"> <li>● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.</li> </ul>                       | French<br><b>ATTENTION</b>                                                         |
| <ul style="list-style-type: none"> <li>● Vermeiden Sie das Einatmen von Schweißrauch!</li> <li>● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!</li> </ul>                        | <ul style="list-style-type: none"> <li>● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)</li> </ul>                                                     | <ul style="list-style-type: none"> <li>● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!</li> </ul>                                | German<br><b>WARNUNG</b>                                                           |
| <ul style="list-style-type: none"> <li>● Mantenha seu rosto da fumaça.</li> <li>● Use ventilação e exaustão para remover fumo da zona respiratória.</li> </ul>                                | <ul style="list-style-type: none"> <li>● Não opere com as tampas removidas.</li> <li>● Desligue a corrente antes de fazer serviço.</li> <li>● Não toque as partes elétricas nuas.</li> </ul> | <ul style="list-style-type: none"> <li>● Mantenha-se afastado das partes moventes.</li> <li>● Não opere com os painéis abertos ou guardas removidas.</li> </ul> | Portuguese<br><b>ATENÇÃO</b>                                                       |
| <ul style="list-style-type: none"> <li>● ヒュームから頭を離すようにして下さい。</li> <li>● 換気や排煙に十分留意して下さい。</li> </ul>                                                                                           | <ul style="list-style-type: none"> <li>● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切して下さい。</li> </ul>                                                                                                  | <ul style="list-style-type: none"> <li>● パネルやカバーを取り外したまま機械操作をしないで下さい。</li> </ul>                                                                                | Japanese<br>● Keep flammable materials away.                                       |
| <ul style="list-style-type: none"> <li>● 頭部遠離煙霧。</li> <li>● 在呼吸區使用通風或排風器除煙。</li> </ul>                                                                                                        | <ul style="list-style-type: none"> <li>● 維修前切斷電源。</li> </ul>                                                                                                                                 | <ul style="list-style-type: none"> <li>● 儀表板打開或沒有安全罩時不準作業。</li> </ul>                                                                                           | Chinese<br>● Mantenga el material combustible fuera del área de trabajo.           |
| <ul style="list-style-type: none"> <li>● 얼굴로부터 용접가스를 멀리하십시오.</li> <li>● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오.</li> </ul>                                                                 | <ul style="list-style-type: none"> <li>● 보수전에 전원을 차단하십시오.</li> </ul>                                                                                                                         | <ul style="list-style-type: none"> <li>● 판넬이 열린 상태로 작동치 마십시오.</li> </ul>                                                                                        | Korean<br>● Gardez à l'écart de tout matériel inflammable.                         |
| <ul style="list-style-type: none"> <li>● ابعد رأسك بعيداً عن الدخان.</li> <li>● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.</li> </ul>               | <ul style="list-style-type: none"> <li>● اقطع التيار الكهربائي قبل القيام بأية صيانة.</li> </ul>                                                                                             | <ul style="list-style-type: none"> <li>● لا تشغيل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.</li> </ul>                                            | Arabic<br>● Entfernen Sie brennbares Material!                                     |

**LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.**

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的銀焊材料，並請遵守貴方的有關勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.



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