

# LN-25™ PRO DUAL POWER

## OPERATOR'S MANUAL



ENGLISH



THE LINCOLN ELECTRIC COMPANY  
22801 St. Clair Ave., Cleveland Ohio 44117-1199 USA  
[www.lincolnelectric.eu](http://www.lincolnelectric.eu)

# THE LINCOLN ELECTRIC COMPANY



## EC DECLARATION OF CONFORMITY

Manufacturer and technical documentation holder:

The Lincoln Electric Company

Address:

22801 St. Clair Ave.  
Cleveland Ohio 44117-1199 USA

EC Company:

Lincoln Electric Europe S.L.

Address:

c/o Balmes, 89 - 80 2a  
08008 Barcelona  
SPAIN

Hereby declare that welding equipment:

LN-25 PRO & LN-25 PRO Dual

Sales codes:

K2613 & K2614 (codes may also contain prefixes and suffixes)

Is in conformity with Council Directives and amendments:

EMC Directive 2004/108/EC

Low Voltage Directive 2006/95/EC

Standards:

EN 60974-5, Arc Welding Equipment – Part 5: Wire Feeders, 2008

EN 60974-10 Arc Welding Equipment – Part 10: Electromagnetic compatibility (EMC) requirements, 2003

A handwritten signature in black ink, appearing to read "Frank Stupczy", written over a horizontal line.

Frank Stupczy, Manufacturer  
Compliance Engineering Manager

11 January 2010

A handwritten signature in dark ink, appearing to read "Dario Gatti", written over a horizontal line.

Dario Gatti, European Community Representative  
European Engineering Manager

12 January 2010

MCD143



12/05

**THANKS!** For having choosen the QUALITY of the Lincoln Electric products.

- Please Examine Package and Equipment for Damage. Claims for material damaged in shipment must be notified immediately to the dealer.
- For future reference record in the table below your equipment identification information. Model Name, Code & Serial Number can be found on the machine rating plate.

Model Name:	
.....	
Code & Serial number:	
.....	.....
Date & Where Purchased:	
.....	.....

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## WARNING

This equipment must be used by qualified personnel. Be sure that all installation, operation, maintenance and repair procedures are performed only by qualified person. Read and understand this manual before operating this equipment. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment. Read and understand the following explanations of the warning symbols. Lincoln Electric is not responsible for damages caused by improper installation, improper care or abnormal operation.

	<b>WARNING:</b> This symbol indicates that instructions must be followed to avoid serious personal injury, loss of life, or damage to this equipment. Protect yourself and others from possible serious injury or death.
	<b>READ AND UNDERSTAND INSTRUCTIONS:</b> Read and understand this manual before operating this equipment. Arc welding can be hazardous. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment.
	<b>ELECTRIC SHOCK CAN KILL:</b> Welding equipment generates high voltages. Do not touch the electrode, work clamp, or connected work pieces when this equipment is on. Insulate yourself from the electrode, work clamp, and connected work pieces.
	<b>ELECTRICALLY POWERED EQUIPMENT:</b> Turn off input power using the disconnect switch at the fuse box before working on this equipment. Ground this equipment in accordance with local electrical regulations.
	<b>ELECTRICALLY POWERED EQUIPMENT:</b> Regularly inspect the input, electrode, and work clamp cables. If any insulation damage exists replace the cable immediately. Do not place the electrode holder directly on the welding table or any other surface in contact with the work clamp to avoid the risk of accidental arc ignition.
	<b>ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS:</b> Electric current flowing through any conductor creates electric and magnetic fields (EMF). EMF fields may interfere with some pacemakers, and welders having a pacemaker shall consult their physician before operating this equipment.
	<b>CE COMPLIANCE:</b> This equipment complies with the European Community Directives.
	<b>FUMES AND GASES CAN BE DANGEROUS:</b> Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. To avoid these dangers the operator must use enough ventilation or exhaust to keep fumes and gases away from the breathing zone.
	<b>ARC RAYS CAN BURN:</b> 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. Use suitable clothing made from durable flame-resistant material to protect you skin and that of your helpers. Protect other nearby personnel with suitable, non-flammable screening and warn them not to watch the arc nor expose themselves to the arc.
	<b>WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION:</b> Remove fire hazards from the welding area and have a fire extinguisher readily available. Welding sparks and hot materials from the welding process can easily go through small cracks and openings to adjacent areas. Do not weld on any tanks, drums, containers, or material until the proper steps have been taken to insure that no flammable or toxic vapors will be present. Never operate this equipment when flammable gases, vapors or liquid combustibles are present.
	<b>WELDED MATERIALS CAN BURN:</b> Welding generates a large amount of heat. Hot surfaces and materials in work area can cause serious burns. Use gloves and pliers when touching or moving materials in the work area.
	<b>SAFETY MARK:</b> This equipment is suitable for supplying power for welding operations carried out in an environment with increased hazard of electric shock.

	<b>CYLINDER MAY EXPLODE IF DAMAGED:</b> 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. Always keep cylinders in an upright position securely chained to a fixed support. Do not move or transport gas cylinders with the protection cap removed. Do not allow the electrode, electrode holder, work clamp or any other electrically live part to touch a gas cylinder. Gas cylinders must be located away from areas where they may be subjected to physical damage or the welding process including sparks and heat sources.
	<b>NOISE APPEARES DURING WELDING CAN BE HARMFUL:</b> Welding arc can cause noise with high level of 85dB for 8-hour week day. Welders operating welding machines are obligated to wear the proper ear protectors /appendix No. 2 for the Decree of the Secretary of Labor and Social Policy from 17.06 1998 – Dz.U. No. 79 pos. 513/. According to the Decree the Secretary of Health and Social Welfare from 09.07.1996 /Dz.U. No. 68 pos. 194/, employers are obligated to carry examinations and measurements of health harmful factors.
	<b>MOVING PARTS ARE DANGEROUS:</b> There are moving mechanical parts in this machine, which can cause serious injury. Keep your hands, body and clothing away from those parts during machine starting, operating and servicing.

## Installation and Operator Instructions

Read this entire section before installation or operation of the machine.

### **WARNING**

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

- Turn the input power OFF at the disconnect switch or fuse box before attempting to connect or disconnect input power lines, output cables or control cables.
- Only qualified personnel should perform this installation.
- Do not touch metal portions of the work clip when the welding power source is on.
- Do not attach the work clip to the wire feeder.
- Connect the work clip directly to the work, as close as possible to the welding arc.
- Turn power off at the welding power source before disconnecting the work clip from the work.
- Only use on power sources with open circuit voltages less than 110 VDC.

### **Location**

For best wire feeding performance, place the LN-25™ PRO DUAL POWER on a stable and dry surface. Keep the wire feeder in a vertical position.

- Do not operate the wire feeder on an angled surface of more than 15 degrees.
- Do not submerge the LN-25™ PRO DUAL POWER.
- The LN-25™ PRO DUAL POWER is rated IP23 and is suitable for outdoor use.
- The handle of the LN-25™ PRO DUAL POWER is intended for moving the wire feeder about the work place only.
- When suspending a wire feeder, insulate the hanging device from the wire feeder enclosure.

### **Weld Cable Size**

Table 1 located below are copper cable sizes recommended for different currents and duty cycles. Lengths stipulated are the distance from the welder to work and back to the welder again. Cable sizes are increased for greater lengths primarily for the purpose of minimizing cable drop.

### **WARNING**

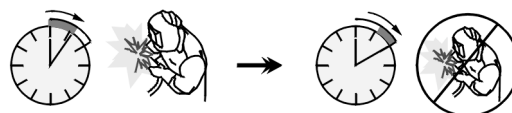
#### **HIGH FREQUENCY PROTECTION**

Locate the LN-25™ PRO DUAL POWER away from radio controlled machinery. The normal operation of the LN-25™ PRO DUAL POWER may adversely affect the operation of RF controlled equipment, which may result in bodily injury or damage to the equipment.

### **Duty Cycle and Overheating**

The duty cycle of a welding machine is the percentage of time in a 10 minute cycle at which the welder can operate the machine at rated welding current.

Example: 60% Duty Cycle:



Welding for 6 minutes.

Break for 4 minutes.

Excessive extension of the duty cycle will cause the thermal protection circuit to activate. See "Technical Specification".

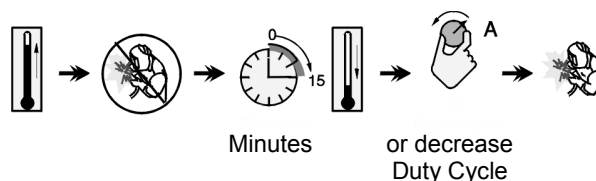


TABLE .1

RECOMMENDED CABLE SIZES (RUBBER COVERED COPPER - RATED 75°C)**						
Current	Duty Cycle	Cable Sizes for Combined Lengths of Electrode and Work Cables				
		0 to 15 m	15 to 30 m	30 to 46 m	46 to 61 m	61 to 76 m
200 A	60 %	35mm <sup>2</sup> (2AWG)	35mm <sup>2</sup> (2AWG)	35mm <sup>2</sup> (2AWG)	50mm <sup>2</sup> (1AWG)	70mm <sup>2</sup> (1/0AWG)
200 A	100 %	35mm <sup>2</sup> (2AWG)	35mm <sup>2</sup> (2AWG)	35mm <sup>2</sup> (2AWG)	50mm <sup>2</sup> (1AWG)	70mm <sup>2</sup> (1/0AWG)
225 A	20 %	25mm <sup>2</sup> (4 or 5AWG)	35mm <sup>2</sup> (3AWG)	35mm <sup>2</sup> (2AWG)	50mm <sup>2</sup> (1AWG)	70mm <sup>2</sup> (1/0AWG)
225 A	40 % & 30 %	35mm <sup>2</sup> (3AWG)	35mm <sup>2</sup> (3AWG)	35mm <sup>2</sup> (2AWG)	50mm <sup>2</sup> (1AWG)	70mm <sup>2</sup> (1/0AWG)
250 A	30 %	35mm <sup>2</sup> (3AWG)	35mm <sup>2</sup> (3AWG)	35mm <sup>2</sup> (2AWG)	50mm <sup>2</sup> (1AWG)	70mm <sup>2</sup> (1/0AWG)
250 A	40 %	35mm <sup>2</sup> (2AWG)	35mm <sup>2</sup> (2AWG)	50mm <sup>2</sup> (1AWG)	50mm <sup>2</sup> (1AWG)	70mm <sup>2</sup> (1/0AWG)
250 A	60 %	50mm <sup>2</sup> (1AWG)	50mm <sup>2</sup> (1AWG)	50mm <sup>2</sup> (1AWG)	50mm <sup>2</sup> (1AWG)	70mm <sup>2</sup> (1/0AWG)
250 A	100 %	50mm <sup>2</sup> (1AWG)	50mm <sup>2</sup> (1AWG)	50mm <sup>2</sup> (1AWG)	50mm <sup>2</sup> (1AWG)	70mm <sup>2</sup> (1/0AWG)
300 A	60 %	50mm <sup>2</sup> (1AWG)	50mm <sup>2</sup> (1AWG)	50mm <sup>2</sup> (1AWG)	70mm <sup>2</sup> (1/0AWG)	70mm <sup>2</sup> (2/0AWG)
325 A	100 %	70mm <sup>2</sup> (2/0AWG)	70mm <sup>2</sup> (2/0AWG)	70mm <sup>2</sup> (2/0AWG)	70mm <sup>2</sup> (2/0AWG)	95mm <sup>2</sup> (3/0AWG)
350 A	60 %	70mm <sup>2</sup> (1/0AWG)	70mm <sup>2</sup> (1/0AWG)	70mm <sup>2</sup> (2/0AWG)	70mm <sup>2</sup> (2/0AWG)	95mm <sup>2</sup> (3/0AWG)
400 A	60 %	70mm <sup>2</sup> (2/0AWG)	70mm <sup>2</sup> (2/0AWG)	70mm <sup>2</sup> (2/0AWG)	95mm <sup>2</sup> (3/0AWG)	120mm <sup>2</sup> (4/0AWG)
400 A	100 %	70mm <sup>2</sup> (2/0AWG)	95mm <sup>2</sup> (3/0AWG)	95mm <sup>2</sup> (3/0AWG)	95mm <sup>2</sup> (3/0AWG)	120mm <sup>2</sup> (4/0AWG)
500 A	60 %	70mm <sup>2</sup> (2/0AWG)	70mm <sup>2</sup> (2/0AWG)	95mm <sup>2</sup> (3/0AWG)	95mm <sup>2</sup> (3/0AWG)	120mm <sup>2</sup> (4/0AWG)

\*\* Tabled values are for operation at ambient temperatures of 40°C and below. Applications above 40°C may require cables larger than recommended, or cables rated higher than 75°C.

## Cable Connections

There is one circular connector for the gun trigger on the front of the LN-25™ PRO DUAL POWER.

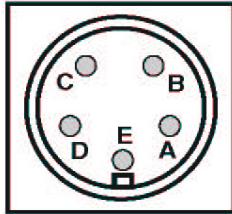


Fig A.1

Function	Pin	Wiring
5-pin trigger connector for push-guns only.	A	Trigger
	B	Not used
	C	Common
	D	Not used
	E	Not used

## Shielding Gas Connection

### ⚠ WARNING

**CYLINDER may explode if damaged.**

- Keep cylinder upright and chained to support.
- Keep cylinder away from areas where it may be damaged.
- Never lift welder with cylinder attached.
- Never allow welding electrode to touch cylinder.
- Keep cylinder away from welding or other live electrical circuits.
- BUILD UP OF SHIELDING GAS MAY HARM HEALTH OR KILL.
- Shut off shielding gas supply when not in use.

Maximum inlet pressure is 6.9 bar (100 psi).

Install the shielding gas supply as follows:

- Secure the cylinder to prevent it from falling.
- Remove the cylinder cap. Inspect the cylinder valves and regulator for damaged threads, dirt, dust, oil or grease. Remove dust and dirt with a clean cloth. **DO NOT ATTACH THE REGULATOR IF OIL, GREASE OR DAMAGE IS PRESENT!** Inform your gas supplier of this condition. Oil or grease in

the presence of highpressure oxygen is explosive.

- Stand to one side away from the outlet and open the cylinder valve for an instant. This blows away any dust or dirt which may have accumulated in the valve outlet.
- Attach the flow regulator to the cylinder valve and tighten the union nut(s) securely with a wrench. Note: if connecting to 100% CO<sub>2</sub> cylinder, insert regulator adapter between regulator and cylinder valve. If adapter is equipped with a plastic washer, be sure it is seated for connection to the CO<sub>2</sub> cylinder.
- Attach one end of the inlet hose to the outlet fitting of the flow regulator. Attach the other end to the welding system shielding gas inlet. Tighten the union nuts with a wrench.
- Before opening the cylinder valve, turn the regulator adjusting knob counterclockwise until the adjusting spring pressure is released.
- Standing to one side, open the cylinder valve slowly a fraction of a turn. When the cylinder pressure gage stops moving, open the valve fully.
- The flow regulator is adjustable. Adjust it to the flow rate recommended for the procedure and process being used before making a weld.

## Wire Drive Configuration

### Changing the Gun Receiver Bushing

### ⚠ WARNING

**ELECTRIC SHOCK can kill.**

- Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.
- Do not touch electrically live parts.
- When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Do not operate with covers, panels or guards removed or open.
- Only qualified personnel should perform maintenance work.

Tools required: 1/4" hex key wrench.



Note: Some gun bushings do not require the use of the thumb screw.

- Turn power off at the welding power source.
- Remove the welding wire from the wire drive.
- Remove the thumb screw from the wire drive.
- Remove the welding gun from the wire drive.
- Loosen the socket head cap screw that holds the connector bar against the gun bushing. **Important: Do not attempt to completely remove the socket head cap screw.**
- Remove the outer wire guide, and push the gun bushing out of the wire drive. Because of the precision fit, light tapping may be required to remove the gun bushing.
- Disconnect the shielding gas hose from the gun bushing, if required.
- Connect the shielding gas hose to the new gun bushing, if required.
- Rotate the gun bushing until the thumb screw hole aligns with the thumb screw hole in the feed plate. Slide the gun receiver bushing into the wire drive and verify the thumb screw holes are aligned.
- Tighten the socket head cap screw.
- Insert the welding gun into the gun bushing and tighten the thumb screw.

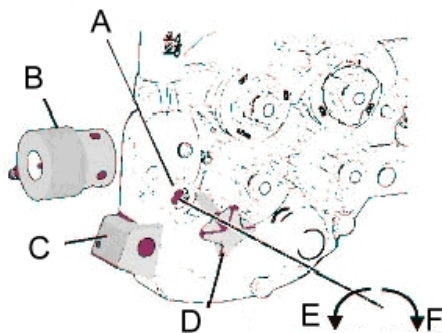


Fig. A.2

- A. Socket Head Cap Screw
- B. Gun Receiver Bushing
- C. Connector Block
- D. Thumb Screw
- E. Loosen
- F. Tighten

## Procedure to Install Drive Rolls and Wire Guides

### ⚠ WARNING

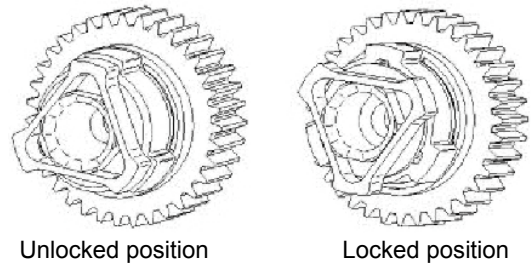
#### ELECTRIC SHOCK can kill.

- Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.
- Do not touch electrically live parts.
- When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Do not operate with covers, panels or guards removed or open.
- Only qualified personnel should perform maintenance work.

To remove drive rolls and wire guides:

- Turn power off at the welding power source.

- Release the idle roll pressure arm.
- Remove the outer wire guide by turning the knurled thumbscrews counter-clockwise to unscrew them from the feed plate.
- Rotate the triangular lock and remove the drive rolls.
- Remove the inner wire guide.



- Insert the new inner wire guide, groove side out, over the two locating pins in the feed plate.
- Install a drive roll on each hub assembly secure with the triangular lock.
- Install the outer wire guide by aligning it with the pins and tightening the knurled thumbscrews.
- Close the idle arm and engage the idle roll pressure arm. Adjust the pressure appropriately.

## Pressure Arm Adjustment

### ⚠ WARNING

#### ELECTRIC SHOCK can kill.

- Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.
- Do not touch electrically live parts.
- When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Do not operate with covers, panels or guards removed or open.
- Only qualified personnel should perform maintenance work.

The pressure arm controls the amount of force the drive rolls exert on the wire. Proper adjustment of the pressure arm gives the best welding performance.

Set the pressure arm as follows (see Fig A.3):

- Aluminum wires: between 1 and 3
- Cored wires: between 3 and 4
- Steel, Stainless wires: between 4 and 6

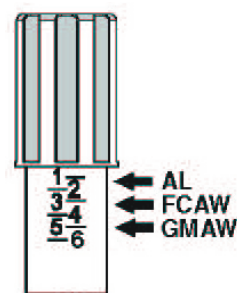


Fig A.3

## Loading Spools of Wire

### **WARNING**

- Keep hands, hair, clothing and tools away from rotating equipment.
- Do not wear gloves when threading wire or changing wire spool.
- Only qualified personnel should install, use or service this equipment

Loading 4.5 – 6.8kg Spools.

A K468 spindle adapter is required for loading 51mm wide spools on 51mm spindles. Use aK468 spindle adapter for loading 64mm wide spools.

- Squeeze the release bar on the retaining collar and remove it from the spindle.
- Place the spindle adapter on the spindle, aligning the spindle brake pin with the hole in the adapter.
- Place the spool on the spindle and align the adapter brake tab with one of the holes in the back side of the spool. An indicator mark on the end of the spindle shows the orientation of the brake tab. Be certain the wire feeds off of the spool in the proper direction.
- Re-install the retaining collar. Make sure that the release bar snaps out and that the retaining collar fully engages the groove on the spindle.

## Gun Connection

### **WARNING**

**ELECTRIC SHOCK can kill.**

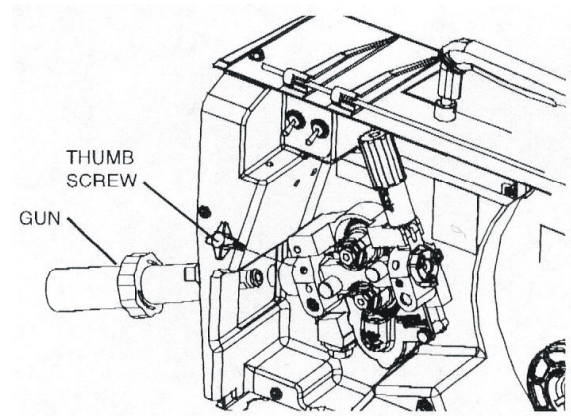
- Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.
- Do not touch electrically live parts.
- When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Do not operate with covers, panels or guards removed or open.
- Only qualified personnel should perform maintenance work.

The LN-25™ PRO DUAL POWER comes with a K1500-2 gun adapter installed. (See Fig A.4)

To install a gun:

- Turn power OFF.
- Remove the thumb screw.
- Push the gun the completely into the gun bushing.
- Secure the gun in place with the thumb screw.
- Connect the trigger cable from the gun to the trigger connector on the front of the feeder.

Note: Not all gun bushings require the use of the thumb screw.



**Fig A.4**



## Power Source to LN-25™ Pro Cable Connection Diagram CC Power Sources with Output Terminals Always Hot (See Fig A.5)

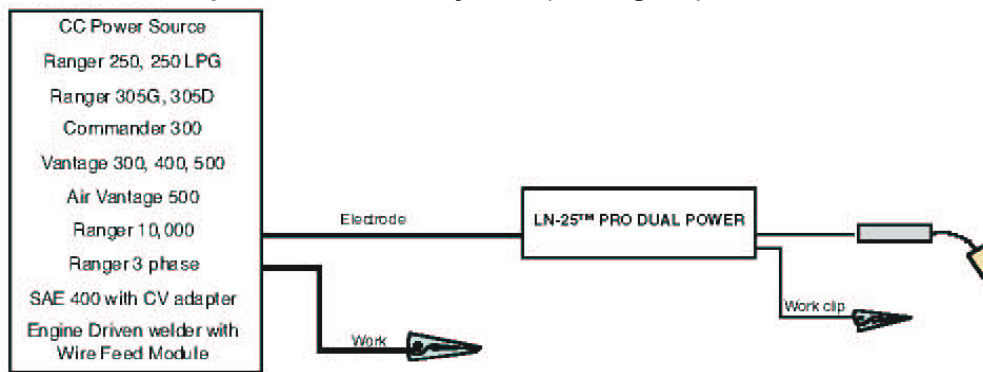


Fig A.5

If the power source has a Remote/Local switch, place the switch in the Local position.

Place the CV/CC switch in the feeder in the "CC" position.

K#	Description
K2614-1	LN-25 Pro Dual Power
KP1695-XX	Drive Roll Kit
KP1696-XX	
KP1697-XX	
See Magnum Literature	Welding Gun
	CC Power Source
K1803-1	Welding Cables

## CV Power Sources with Stud Connectors and Remote/Local Switch (See Fig A.6)

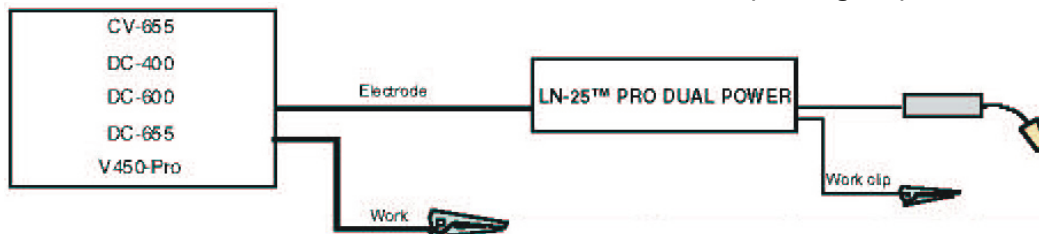


Fig A.6

Place the power source Remote/Local switch in the Local position.

Place the CV/CC switch in the feeder in the "CV" position.

K#	Description
K2614-1	LN-25 Pro Dual Power
KP1695-XX	Drive Roll Kit
KP1696-XX	
KP1697-XX	
See Magnum Literature	Welding Gun
	CV Power Source
K1803-1	Welding Cables

## CV Power Sources with Stud Connectors and no Remote/Local Switch. (See Fig A.7)

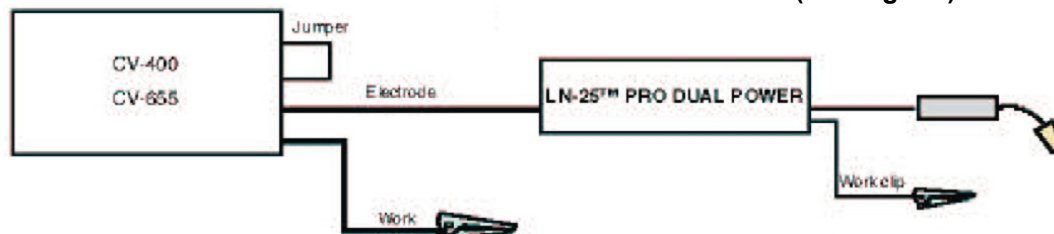
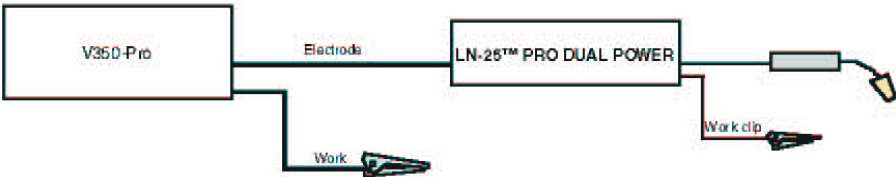


Fig A.7

Place the CV/CC switch in the feeder in the "CV" position.

K#	Description
K2614-1	LN-25 Pro Dual Power
KP484	Jumper Plug Kit
KP1695-XX	Drive Roll Kit
KP1696-XX	
KP1697-XX	
See Magnum Literature	Welding Gun
	CV Power Source
K1803-1	Welding Cables

**CV Power Source with Twist-Mate Connectors and Remote/Local Switch. (See Fig A.8)**

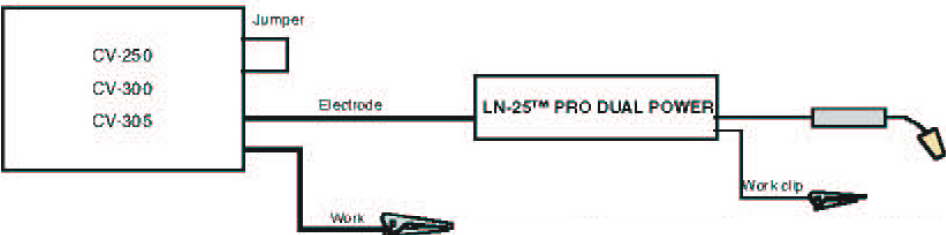


**Fig A.8**

Place the CV/CC switch in the feeder in the "CV" position.

K#	Description
K2614-1	LN-25 Pro Dual Power
KP1695-XX	Drive Roll Kit
KP1696-XX	
KP1697-XX	
See Magnum Literature	Welding Gun
	CV Power Source
K1803-1	Welding Cables

**CV Power Source with Twist-Mate Connectors and no Remote/Local Switch. (See Fig A.9)**

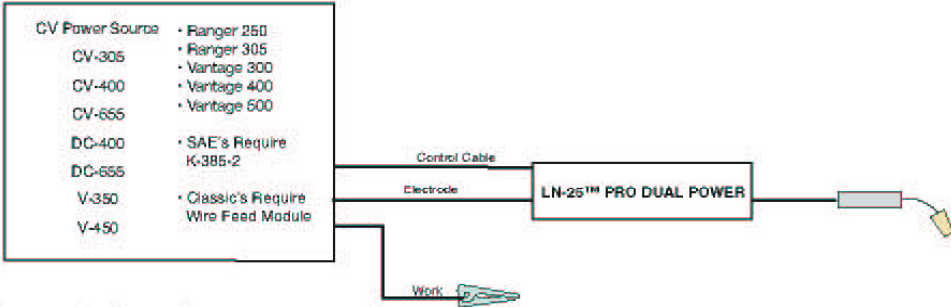


**Fig A.9**

Place the CV/CC switch in the feeder in the "CV" position.

K#	Description
K2614-1	LN-25 Pro Dual Power
KP1695-XX	Drive Roll Kit
KP1696-XX	
KP1697-XX	
See Magnum Literature	Welding Gun
	CV Power Source
K1803-1	Welding Cables
K484	Jumper Plug Kit

**CV Power Source with 24 or 42 VAC (See Fig A.10)**



**Fig A.10**

If present, place the power source Remote/Local Switch in the Remote position.

Place the CV/CC switch in the feeder in the "CV" position.

K#	Description
K2614-1	LN-25 Pro Dual Power
KP1695-XX	Drive Roll Kit
KP1696-XX	
KP1697-XX	
K1797-XX	Adapter for Competitive Power Source
K2335-1	
See Magnum Literature	Welding Gun
	CV Power Source
	Welding Cables
K852-95	Twist-Mate Cable Plug

## Operation

### Product Description

#### General Physical Description

The LN-25™ PRO DUAL POWER is specially engineered to be the most rugged portable wire feeder available. Several models of the LN-25™ PRO DUAL POWER are offered to best meet individual welder needs. The Extra Torque model features additional torque gearing for reliable feeding of large diameter FCAW wires. All of the models include a gas solenoid and flow meter for the flexibility to run most wire processes.

The plastic case is molded from a high impact, flame retardant plastic for durability and low weight. The patent pending design keeps the internal components protected and dry.

The heart of the LN-25™ PRO DUAL POWER is the 2 roll MAXTRAC™ drive. The patented features on the wire drive offer tool-less changing of the drive rolls and wire guides for quick spool changes. A tachometer controlled motor powers the patent pending drive rolls for smooth, steady feeding without slippage.

With only one p.c. board, the LN-25™ PRO DUAL POWER is designed to be simple, reliable and easy to service. The p.c. board is mounted with Lincoln's leading environmental design protection by mounting the board in a plastic tray and potting it with epoxy.

#### General Functional Description

The LN-25™ PRO DUAL POWER as designed is a simple, robust feeder. Standard features include a calibrated wire feed speed dial, 2 step/trigger interlock switch, CV-CC switch, Gas Purge and Cold Feed. Adding the digital meter/remote voltage kit expands the wire feeder functions. The digital meters display arc voltage, arc amperage and preset wire feed speed. The meters also display preset voltage with select power sources if a control cable is used. The kit includes a switch for fixed Run-in WFS.

The Dual Power LN-25 PRO has a patent pending electronic circuit to allow easy transition from Across the Arc operation to Control Cable operation. Simply connect the work clip and the electrode lead for Across the Arc welding. Whenever a control cable is connected, the feeder switches to Control Cable operation.

To improve contactor life, the contactor is always closed when operating as a control cable feeder.

### Recommended Processes

- GMAW
- FCAW

### Process Limitations

- GMAW-P procedures must be qualified by the customer.
- Across-the-Arc models are not recommended for stitch or spot welding.

### Equipment Limitations

- The duty cycle of the wire feeder is 325A, 100% and 450A, 60%. Duty cycle is based upon the amount of welding performed in a 10 minute period.
- The maximum spool size is 45 lb, 12" diameter.

- Maximum FCAW gun length is 15 ft.
- Maximum GMAW gun length is 25 ft.
- Push-pull guns do not work with the wire feeder.
- Digital displays do not show preset voltage.
- When using the digital meter kit, preset voltage is accurate only with the following power sources:

Invertec V-350 CV-305  
Invertec V-450 CV-400  
DC-400  
DC-600  
DC-655

### Recommended Power Sources

CV-250  
CV-300  
CV-305  
CV-400  
CV-655  
DC-400  
DC-600  
DC-655  
Invertec V-350 PRO  
Invertec V-450 PRO  
Multi-Weld 350  
Ranger 10,000  
Ranger 3 Phase  
Ranger GXT  
Ranger 250  
Ranger 305  
SAE-400  
Pipelinier 200G  
Classic 300  
Vantage 300  
Vantage 400  
Vantage 500  
Air Vantage 500

### Case Front Controls

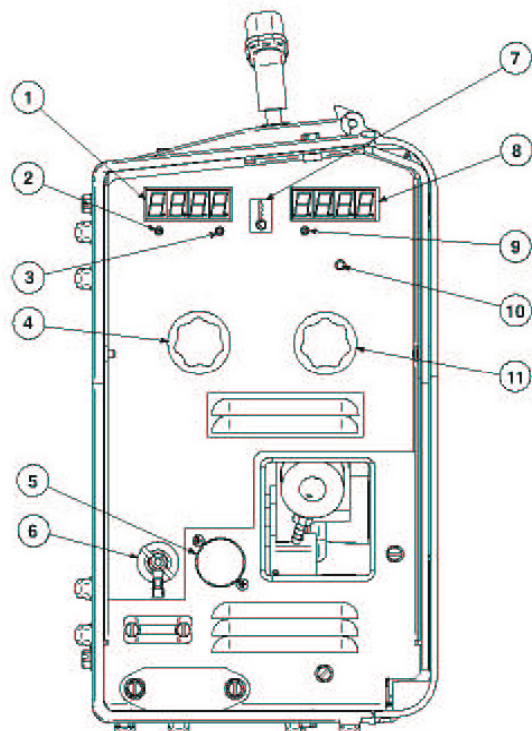


Fig B.1

1. Wire Feed Speed/Amperage Display
2. Wire Feed Speed LED
3. Amperage LED
4. Wire Feed Speed Knob
5. 5 pin gun trigger connector
6. Work Clip Connection
7. Thermal LED
8. Voltage Display
9. Voltage LED
10. Set-up Push Button
11. Remote Voltage Control Knob

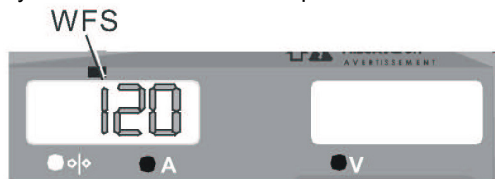
## Power-up Sequence

All of the LED's will briefly illuminate during power-up. If the gun trigger is activated during power up, the feeder will not operate until the gun trigger is released.

### 1. WIRE FEED SPEED/AMPERAGE DISPLAY

#### Idle

The left display shows the wire feed speed. The right display is blank. The wire feed speed LED is lit.



#### Welding

The left display shows the amperage and the right display shows the arc voltage. If the wire feeder is connected for electrode negative welding, then the voltage display shows a minus sign. The amperage and voltage LEDs are lit.



#### After Welding

The display continues to hold the value of the amperage and arc voltage for five seconds after welding stops. The amperage and voltage displays flash.

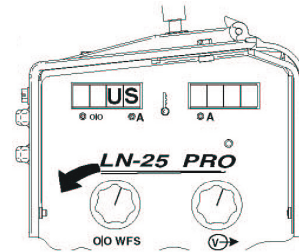
#### Set-Up Menu

To enter the set-up menu, use paper clip to press the small button located on the case front.

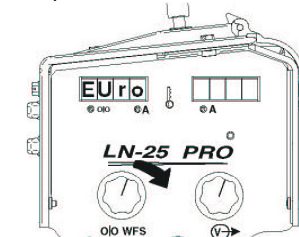


## Wire Feed Speed Units

Rotate the WFS knob to the left to use "inches/minute" for the wire feed speed units.



Rotate the WFS knob to the right to use "meters/minute" for the wire feed speed units.



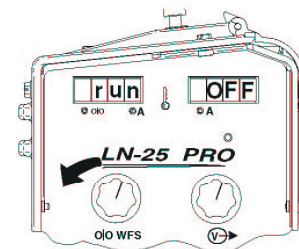
Press the set-up button again.

## Run-in

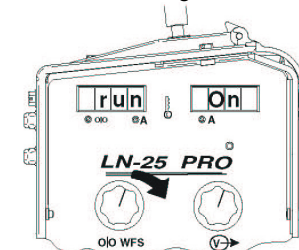
"Run-in" refers to the wire feed speed during the time from when the trigger is pulled to when an arc is struck. When **Run-in** is "**ON**", the wire feed speed is reduced until an arc is struck. Factory setting is **Run-In "OFF"**. The Standard Wire Feed Speed (50 in/min).

When **Run-in** is "**OFF**", the wire feed speed is the same as the welding wire feed speed. Turn **Run-In "OFF"** for fast, crisp starts, especially when running with 0.9 or 1.2mm solid steel wires at high wire feed speeds.

Rotate the WFS knob to the left to turn **Run-In OFF**.



Rotate the WFS knob to the right to turn **Run-In ON**.



### 2. WIRE FEED SPEED LED

(See displays in Item 1 for LED functions.)

### 3. AMPERAGE LED

(See displays in Item 1 for LED functions.)



#### 4. WIRE FEED SPEED KNOB

(See displays in Item 1 for LED read out.)

#### 5. 5-PIN GUN TRIGGER CONNECTOR

Control Cable plugs into from Gun and Cable Assembly.

#### 6. WORK CLIP CONNECTION

Connects to the work piece.

#### 7. THERMAL LED

##### Thermal LED, Motor Overload.

The thermal light illuminates when the wire drive motor draws too much current. If the thermal light illuminates, the wire drive will automatically shutdown for up to 30 seconds to allow the motor to cool. To start welding again, release the gun trigger, inspect the gun cable, liner (and conduit). Clean and make repairs as necessary. Start welding again when the problem has been safely resolved.



For best results, keep the gun cable and conduit as straight as possible. Perform regular maintenance and cleaning on the gun liner, conduit and gun. Always use quality electrode, such as L-50 or L-56 from Lincoln Electric.

#### 8. VOLTAGE DISPLAY

(See displays in Item 1 for Voltage functions)

#### 9. VOLTAGE LED

(See displays in Item 1 for LED functions.)

#### 10. SET-UP PUSH BUTTON

#### 11. VOLTAGE KNOB

This knob allows you to control the power source output arc voltage level.

### Internal Controls

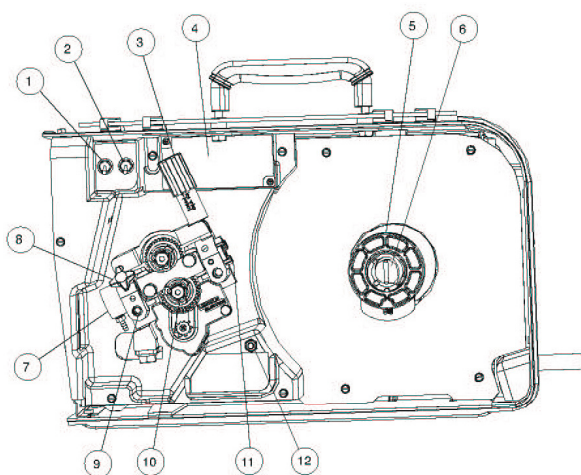


Fig B.2

1. 2 Step Trigger Interlock Switch
2. CV / CC Switch
3. Pressure Adjustment Arm

4. Optional Timer Kit (See Accessories Section)

5. Spool Retainer

6. Spindle Brake

7. Gun Bushing

8. Thumb Screw for securing the welding Gun

9. Socket Head Cap Screw for securing the Gun Bushing

10. Drive Hubs

11. Inlet Wire Guide

12. Cold Feed Pushbutton

### Internal Controls Description

(See Fig B.2)

#### 2 Step - Trigger Interlock Switch

The 2 Step - Trigger Interlock switch changes the function of the gun trigger. 2 Step trigger operation turns welding on and off in direct response to the trigger. Trigger Interlock operation allows welding to continue when the trigger is released for comfort on long welds.



Place the toggle switch in the DOWN position for 2 Step operation or in the UP position for Trigger Interlock operation.

#### 2 Step Trigger

2 Step trigger operation is the most common. When the gun trigger is pulled, the welding power source energizes the electrode output and the wire feeder feeds wire for welding. The power source and wire feeder continue welding until the trigger is released.

#### Trigger Interlock

Trigger Interlock operation provides for operator comfort when making long welds. When the gun trigger is first pulled, the welding power source energizes the output and the wire feeder feeds wire for welding. The gun trigger is then released while the weld is made. To stop welding, the gun trigger is pulled again, and when it is released the welding power source output turns off and the wire feeder stops feeding wire.

#### ⚠ WARNING

If the arc goes out while welding with trigger interlock operation, the electrode output from the welding power source remains energized and the wire feeder will continue to feed wire until the gun trigger is again pulled and then released.

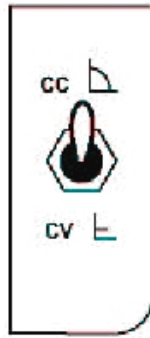
## CV/CC Switch

(See Fig B.2)

The CV/CC switch sets the wire feed speed control method for the wire feeder.

In the CV position, the wire feed speed remains constant during welding. A steady arc voltage is regulated by the power source by adjusting the arc current.

In the CC position, the wire feed speed varies during welding. The arc length is maintained by changing the wire feed speed.



## Cold Feed Pushbutton

(See Fig B.2)

When cold feeding, the wire drive will feed electrode but neither the power source nor the gas solenoid will be energized. Adjust the speed of cold feeding by rotating the WFS knob. Cold feeding, or "cold inching" the electrode is useful for threading the electrode through the gun.

## Constant Current Wire Welding

(See Fig B.3)

Most semiautomatic welding processes perform better using constant voltage power sources.

Welding codes usually do not address the power source selection or specifically, whether the welding process is to be operated in the constant voltage or constant current mode. Instead, codes typically specify limitations on the current, voltage, heat input and preheat temperature based on the material to be welded. The intention is to assure that proper weld material properties will develop.

Welding is sometimes performed using constant current power sources. The operation can be more convenient because it may allow the use of an existing stick (SMAW) power source and the power source can be placed at a distant location without any provision for adjusting the output settings.

For constant current operation, the power source is set to deliver the specified current. The power source regulates this current regardless of changes in the welding circuit, including cable length, electrode diameter, wire feed speed, contact tip to work distance, etc.

Changes in the wire feed speed (WFS) or contact tip to work distance (CTWD) affect the arc voltage when constant current power sources are used. Lowering the wire feed speed raises the voltage, raising the wire feed speed lowers the voltage. Lengthening the contact tip to work distance raises the voltage, shortening the contact tip to work distance lowers the voltage.

If the contact tip to work distance is properly maintained, a satisfactory operating voltage range may be achieved,

and a sound weld may result. However, when a welder uses a longer contact tip to work distance, an arc-sensing wire feeder compensates by increasing the wire feed speed to regulate the voltage. Even if the voltage and current remain unchanged, the increased wire feed speed may result in a deposition rate well beyond the specified range of the electrode. Under these conditions, the specified weld metal properties may not be achieved.

Constant voltage power sources deliver large current surges to stabilize the arc when the electrode is shorted or the arc length is very short. However, a constant current power source does not provide such a response to stabilize the arc. It may be difficult to achieve required weld metal properties, or to achieve the required quality of welds needed to pass nondestructive tests, when such welds are made under constant current operation.

For these reasons, Lincoln Electric does **NOT** recommend constant current semiautomatic welding for applications which need to meet specified weld metal chemical or mechanical property requirements or weld quality requirements.

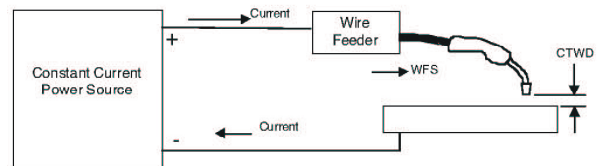


Fig B.3

## Rear Controls

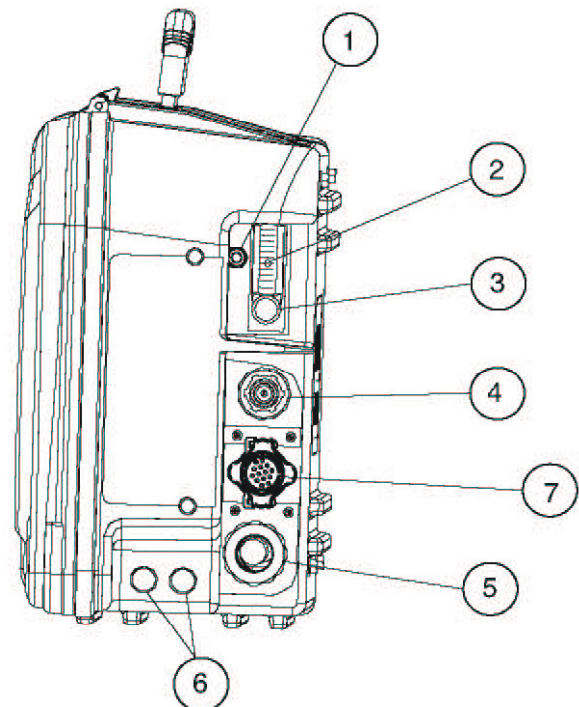


Fig B.4

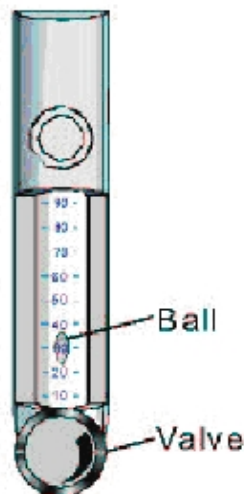
1. **Gas Purge Pushbutton:** The gas solenoid valve will energize but neither the power source output nor the drive motor will be turned on. The Gas Purge switch is useful for setting the proper flow rate of shielding gas. Flow meters should always be adjusted while the shielding gas is flowing.



2. **Flow Meter Ball:** The flowmeter shows the flow rate of shielding gas and has a valve to adjust the flow. The flow meter is scaled for CO<sub>2</sub>, Ar, and Ar/CO<sub>2</sub> blends. The middle of the ball indicates the flow rate of shielding gas.

Adjust the flow rate while depressing the GAS PURGE switch by turning the valve at the bottom of the meter. Most weld procedures require 25-40 scfh (11.8 - 18.9 lpm) for sufficient shielding gas coverage. Gun angle, nozzle diameter, joint configuration and wind conditions may effect the amount of shielding gas required.

When using a wire feeder with a flow meter, adjust the regulator at the shield gas bottle or supply to a flow rate that is higher than the flow rate indicated on the feeder flow meter. Note that most regulators are calibrated based upon having low restrictions on the outlet. The valve on the feeder flow meter creates a high restriction and may cause errors in the readings at the supply regulator. Set the gas flow rate using the feeder flow meter reading and not the supply regulator reading.



SCFH	Liter/Min
10	4.7
20	9.4
30	14.2
40	18.9
50	23.6
60	28.3
70	33.1
80	37.8

3. **Flow Meter Valve**
4. **Shielding Gas Inlet**
5. **Electrode Lead**
6. **Optional Water cooled gun connections**
7. **Control Cable input**

## Electromagnetic Compatibility (EMC)

11/04

This machine has been designed in accordance with all relevant directives and standards. However, it may still generate electromagnetic disturbances that can affect other systems like telecommunications (telephone, radio, and television) or other safety systems. These disturbances can cause safety problems in the affected systems. Read and understand this section to eliminate or reduce the amount of electromagnetic disturbance generated by this machine.



This machine has been designed to operate in an industrial area. To operate in a domestic area it is necessary to observe particular precautions to eliminate possible electromagnetic disturbances. The operator must install and operate this equipment as described in this manual. If any electromagnetic disturbances are detected the operator must put in place corrective actions to eliminate these disturbances with, if necessary, assistance from Lincoln Electric.

Before installing the machine, the operator must check the work area for any devices that may malfunction because of electromagnetic disturbances. Consider the following.

- Input and output cables, control cables, and telephone cables that are in or adjacent to the work area and the machine.
- Radio and/or television transmitters and receivers. Computers or computer controlled equipment.
- Safety and control equipment for industrial processes. Equipment for calibration and measurement.
- Personal medical devices like pacemakers and hearing aids.
- Check the electromagnetic immunity for equipment operating in or near the work area. The operator must be sure that all equipment in the area is compatible. This may require additional protection measures.
- The dimensions of the work area to consider will depend on the construction of the area and other activities that are taking place.

Consider the following guidelines to reduce electromagnetic emissions from the machine.


- Connect the machine to the input supply according to this manual. If disturbances occur it may be necessary to take additional precautions such as filtering the input supply.
- The output cables should be kept as short as possible and should be positioned together. If possible connect the work piece to ground in order to reduce the electromagnetic emissions. The operator must check that connecting the work piece to ground does not cause problems or unsafe operating conditions for personnel and equipment.
- Shielding of cables in the work area can reduce electromagnetic emissions. This may be necessary for special applications.

# Technical Specifications

## LN-25™ PRO DUAL POWER (K2614-1)

INPUT VOLTAGE, CURRENT				
Input Voltage ±10% 15 - 110V DC			Input Current 4A	
RATED OUTPUT @ 40 °C				
Duty Cycle 60% rating 100% rating			Input Current 450 A 325 A	
GEARING – WIRE FEED SPEED – WIRE SIZE				
Standard Speed K2685-2	GMAW		FCAW	
	WFS Range 1.3 – 17.7 m/min	Wire Size 0.6 – 1.6 m/min	WFS Range 1.3 – 17.7 m/min	Wire Size 0.8 – 2.0 m/min
PHYSICAL DIMENSIONS				
Height 376 mm (Handle folded down)	Width 221 mm		Depth 289 mm	Weight 17 kg
TEMPERATURE RANGES				
Operating Temperature -40 °C to 40 °C			Storage Temperature -40 °C to 85 °C	

## WEEE

		07/06	
		<p>Do not dispose of electrical equipment together with normal waste!</p> <p>In observance of European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE) and its implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and returned to an environmentally compatible recycling facility. As the owner of the equipment, you should get information on approved collection systems from our local representative.</p> <p>By applying this European Directive you will protect the environment and human health!</p>	

## Spare Parts

12/05	
<p><b>Part List reading instructions</b></p> <ul style="list-style-type: none"> <li>Do not use this part list for a machine if its code number is not listed. Contact the Lincoln Electric Service Department for any code number not listed.</li> <li>Use the illustration of assembly page and the table below to determine where the part is located for your particular code machine.</li> <li>Use only the parts marked "X" in the column under the heading number called for in the assembly page (# indicate a change in this printing).</li> </ul>	

First, read the Part List reading instructions above, then refer to the "Spare Part" manual supplied with the machine, that contains a picture-descriptive part number cross-reference.

English

**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.

## Accessories

### Factory Installed Equipment:

- K1500-2 Gun Receiver Bushing

### Drive Roll Kits

Wire Type	KP Kits	Electrode Size	Notes
Steel Wires	KP1505-030S	0.6-0.8mm	Includes: 2 V groove drive rolls and inner wire guide.
	KP1505-035S	0.9mm	
	KP1505-045S	1.2mm	
	KP1696-052S	1.4mm	
	KP1696-1/16S	1.6mm	
	KP1696-1	0.9, 1.2mm	
Cored Wires	KP1696-2	1.0mm	Includes: 2 Knurled drive rolls and inner wire guide.
	KP1697-035C	0.8-0.9mm	
	KP1697-045C	1.0-1.2mm	
	KP1697-052C	1.4mm	
	KP1697-1/16C	1.6mm	
	KP1697-068	1.7-1.8mm	
Aluminium Wires	KP1697-5/64	2.0mm	Includes: 2 polished U groove drive rolls, outer wire guide and inner wire guide.
	KP1697-3/32	2.4mm	
	KP1695-035A	0.9mm	
	KP1695-040A	1.0mm	
	KP1695-3/64A	1.2mm	
	KP1695-1/16A	1.6mm	

### Accessories

Kits	Description	Notes
K2672-1	Digital Meter Kit/Remote Voltage Control Kit	Includes: Complete case front panel with high intensity digital meters, 10k potentiometer, ON/OFF switch and harness with 14 pin circular connector. Requires K1797-xx cable for remote control operation.
K2330-2	Timer Kit	Includes: Panel and harness for adjusting preflow, burnback and postflow times.
K2596-1	Aluminum Case	Includes: a complete engineered aluminum case.
K2596-2	Plastic Case	Includes: a complete engineered plastic case.
K1796-xx	AWG 1/0 Co-Axial Power Cable	Includes: 1/0 Coaxial weld cable of length "xx". Ends of the weld cable have lug connections. Use for Pulse welding.
K2593-xx	AWG #1 Coaxial Power Cable	Includes: AWG #1 Coaxial weld cable of length "xx". Ends of the weld cable have lug connections. Use for Pulse or STT™ welding.
K1803-1	Work and Feeder Cables Package	Includes: Twist-Mate to Lug 2/0 cable 14' (1.2m) long with Ground Clamp, and Twist-Mate to Lug 2/0 Cable 9' (2.7m) long.
K1840-xx	Weld Power Cable, Twist-Mate to Lug	Includes: Twist-Mate to Lug, 1/0 cable of length "xx".
K1842-xx	Weld Power Cable, Lug to Lug	Includes: Lug to Lug, 3/0 Cable of length "xx" for lengths up to 60' (18.3m). Lug to Lug, 4/0 Cable of length "xx" for lengths greater than 60' (18.3m).
K1797-xx	Control Cable	Includes: 14 pin to 14 pin wire feeder to power source control cable.
K2335-1	Adapter for Competitive Power Sources	Includes: Adapter control cable for connecting a Lincoln 42 VAC wire feeder to a 24 VAC Miller power source. Requires the digital meter/remote voltage control kit.
K484	Jumper Plug Kit	Includes: 14 pin circular connector with jumper for leads 2-4. For use in power sources for turning the weld terminals "ON" at all times.
K1520-1 (requires Digital Meter/remote control kit)	42 Volt Transformer Kit	Includes: One transformer kit for operating a 42 VAC wire feeder on a power source supplying only 115 VAC.
K1798 (requires remote control)	Adapter Cable for Control Cable to Terminal Strip Power Sources	Includes: 14 circular connector with leads to connect to a terminalstrip.
K910-1	Ground Clamp	Includes: One 300 Amp Ground Clamp.

K910-2	Ground Clamp	Includes: One 500 Amp Ground Clamp.
K1500-1	Gun Receiver Bushing (for guns with K466-1 Lincoln gun connectors; Innershield and Subarc guns)	Includes: Gun receiver bushing, set screw and hex key wrench.
K1500-2	Gun Receiver Bushing (for guns with K466-2, K466-10 Lincoln gun connectors; Magnum 200/300/400 guns and compatible with Tweco® #2-#4)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.
K1500-3	Gun Receiver Bushing (for guns with K613-7 Lincoln gun connectors; Magnum 550 guns and compatible with Tweco® #5)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.
K1500-4	Gun Receiver Bushing (for gun with K466-3 Lincoln gun connectors; compatible with Miller® guns.)	Includes: Gun receiver bushing with hose nipple, set screw and hex key wrench.
K1500-5	Gun Receiver Bushing (compatible with Oxo® guns.)	Includes: Gun receiver bushing with hose nipple, 4 guide tubes, set screw and hex key wrench.
K489-7	Gun Receiver Bushing (for Lincoln Fast-Mate guns.)	Includes: Gun receiver bushing with trigger connector.
K435	Spindle Adapter, for mounting 6.4 kg Innershield Coils on 51 mm spindles.	Includes: Spindle Adapter made from 2 coil retainers. (Electrode not included.)
K468	Spindle Adapter, for mounting 203mm diameter spools on 51 mm spindles.	Includes: 2 Spindle Adapters, one for 2" wide spools and the other for 3" wide spools.
K590-6	Water Connection Kit (for European and Control cable models only)	Includes: 2 hoses with female quick connectors at each end, 2 male connectors for 3/16" ID hose, 2 male connectors for -" ID hose, and mounting hardware.
K586-1	Deluxe Adjustable Gas Regulator	Includes: Deluxe Gas Regulator for Mixed Gases, Adapter for CO <sub>2</sub> and 3.0m Hose.

## Installation of the K590-6 Water Cooling Kit

### **WARNING**

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

- Turn the input power OFF at the disconnect switch before working on this equipment.
- Do not touch electrically hot parts.
- Only qualified personnel should install, use or service this equipment.

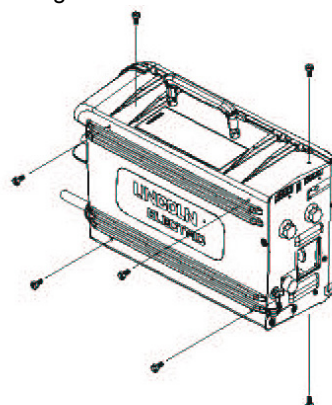
The K590-6 components are rated up to 70 psi (5 bar) and 70°C. Use a coolant fluid that is compatible with the water cooler and the gun.

#### **Tools required:**

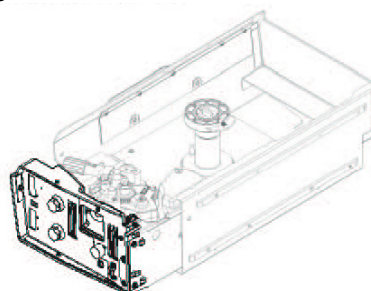
- 3/8" wrench
- 5/16" nut driver
- medium flat bladed screw driver
- cutting tool

1. Turn power off at the welding power source.

2. Remove the screws securing the case to the inner module using a 3/8" wrench.

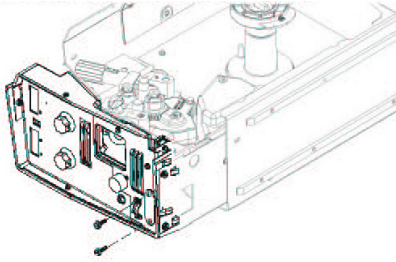


3. Remove the module from the case by lifting the front of the module approximately .25" (6 mm) and then sliding forward.

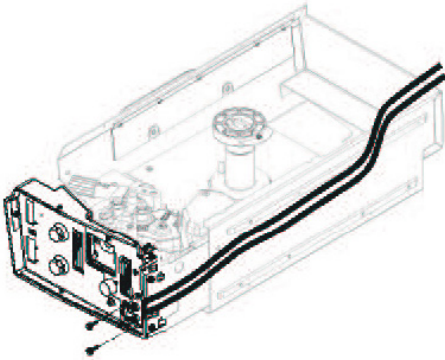




4. Use a 5/16" nut driver to remove the screws holding the water cooling cover on the case front of the inner module and on the rear of the case.

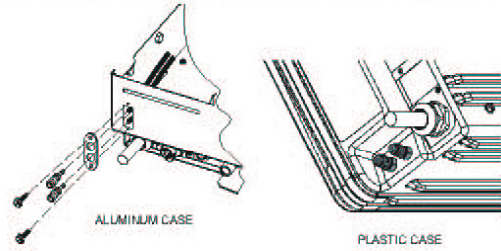


5. Install the fitting and hose assembly to the case front. Route the hoses along the bottom of the inner module and out through the cutout of the cover. Slide the module back into the case.



6. Secure the module to the case with the screws. (Shown in Step 2)

7. Install the fitting assembly to the rear of the case



8. Slide the hose clamps on to the hoses. Trim the hoses to length so that they lay flat on the case bottom. Slide hose clamps on the hose. Slide the hoses on to the fittings on the case rear and secure with the hose clamps.

