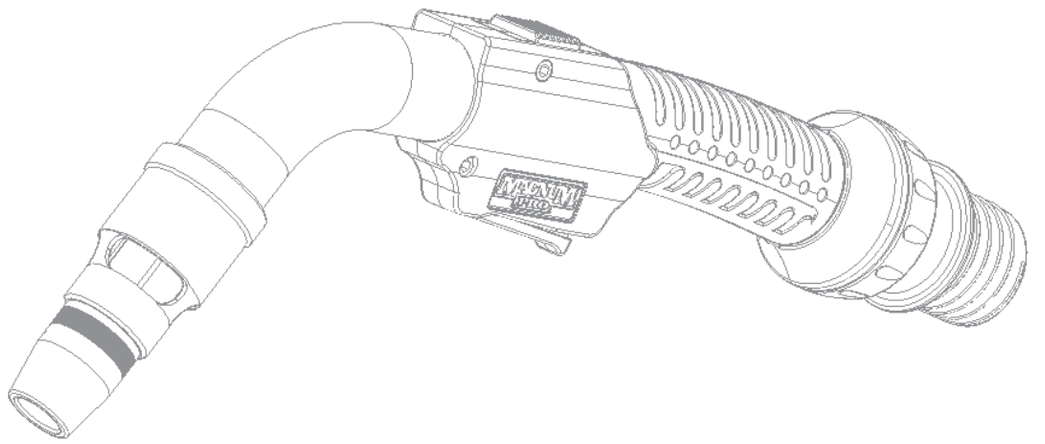
Operator's Manual

Magnum PRO® Fume Guns 250A & 350A

For use with Code Numbers:

K4463-2
K4464-2
K4464-3
K4464-4



Register your machine:
www.lincolnelectric.com/register

Authorized Service and Distributor Locator:
www.lincolnelectric.com/locator

Save for future reference

Date Purchased

Code: (ex: 10859)

Serial: (ex: U1060512345)

IM10654 | Issue Date May-24

THE LINCOLN ELECTRIC COMPANY
22801 St. Clair Avenue • Cleveland, OH • 44117-1199 • U.S.A.
Phone: +1.216.481.8100 • www.lincolnelectric.com

THANK YOU FOR SELECTING A QUALITY PRODUCT BY LINCOLN ELECTRIC.

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.

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.

⚠ 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.

KEEP YOUR HEAD OUT OF THE FUMES.

DON'T get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.

READ and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

USE ENOUGH VENTILATION or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.

IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See below).

USE NATURAL DRAFTS or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.

WEAR CORRECT EYE, EAR & BODY PROTECTION

PROTECT your eyes and face with welding helmet properly fitted and with proper grade of filter plate (See ANSI Z49.1).

PROTECT your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

PROTECT others from splatter, flash, and glare with protective screens or barriers.

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition.

Also, wear safety glasses in work area **AT ALL TIMES.**

SPECIAL SITUATIONS

DO NOT WELD OR CUT containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned. This is extremely dangerous.

DO NOT WELD OR CUT painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

Additional precautionary measures

PROTECT compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.

BE SURE cylinders are never grounded or part of an electrical circuit.

REMOVE all potential fire hazards from welding area.

ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.

SECTION A: WARNINGS

CALIFORNIA PROPOSITION 65 WARNINGS

WARNING: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects, or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an exposed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65 warnings.ca.gov/diesel

WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code § 25249.5 *et seq.)*

WARNING: Cancer and Reproductive Harm www.P65warnings.ca.gov

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. 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.

1.i. Using a generator indoors CAN KILL YOU IN MINUTES.

1.j. Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.

1.k. NEVER use inside a home or garage, EVEN IF doors and windows are open.

1.l. Only use OUTSIDE and far away from windows, doors and vents.

1.m. Avoid other generator hazards. READ MANUAL BEFORE USE.

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.

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. I 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 hardfacing (see instructions on container or SDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also 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.

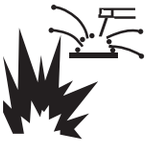
5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

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 Safety Data Sheet (SDS) and follow your employer’s safety practices. SDS forms are available from your welding distributor or from the manufacturer.

5.f. Also see item 1.b.

WELDING AND CUTTING 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.

6.I. Read and follow NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 022690-9101.

6.j. Do not use a welding power source for pipe thawing.

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-I, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association, 14501 George Carter Way Chantilly, VA 20151.

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.

Refer to http://www.lincolnelectric.com/safety for additional safety information.

TECHNICAL SPECIFICATIONS - MAGNUM PRO FUME GUNS

TECHNICAL SPECIFICATIONS	
Models	K4463-2 Magnum Pro 250 amp Fume Gun 15 ft. K4464-2 Magnum Pro 350 amp Fume Gun 15 ft. K4464-3 Magnum Pro 350 amp Fume Gun 20 ft. K4464-4 Magnum Pro 350 amp Fume Gun 25 ft.
Welding Process	GMAW (MIG), FCAW-GS and FCAW-SS.
Rated Welding Current and Ducty Cycle (10-Minute Basis)	K4463-2: 250 amps at 60%, all welding processes. K4464-2: 350 amps at 60%, all welding processes. K4464-3: 350 amps at 60%, all welding processes.. K4464-4: 350 amps at 60%, all welding processes.
Shielding Gas %	To weld GMAW with Mixed Gas use 90%Ar/10%CO2 or consult your welding consumables shielding gas requierements. To weld FCAW-GS with CO2 use 100% CO2.
Gas Flow Rate	Set the supply regulator to deliver a gas flow rate of 50 to 70 SCFH or 1.5 to 2 m³/h.
Filler Wire Alloys	Lincoln SuperArc, Super Glide, Innershield, Ultracore and Outershield brand products
Wire Diameters	K4463-2: .035" - 1/16" K4464-2: .035" - 5/64" K4464-3: .035" - 5/64" K4464-4: .035" - 5/64"
Pressure Difference	2500 PA
Fume Capture Efficiency	85%
Min. Extraction Flow Rate	42 m^3/h
Overall Weight	K4463-2: 10.55 lbs. K4464-2: 11.40 lbs. K4464-3: 14.8 lbs. K4464-4: 18.2 lbs.
Cable Length	K4463-2: 15.0±0.2 ft. K4464-2: 15.0±0.2 ft. K4464-3: 20.0±0.2 ft. K4464-4: 25.0±0.2 ft.
Method of Guidance	Semiautomatic (manually-guided).
Method of Cooling	Air-cooled.

UNPACKING THE FUME GUN

The Magnum PRO® Fume 250 & 350 Amps guns are factory-assembled and tested to meet IEC 60974-7 specification for welding using the GMAW and FCAW processes. Both gun models are shipped with a GMAW fume collection nozzle installed and 0.045 Contact tips. After opening the packaging, check that it contains 1 fully assembled fume gun, 2 FCAW fume collection nozzles, and 1 instruction manual (IM10654).

⚠ WARNING

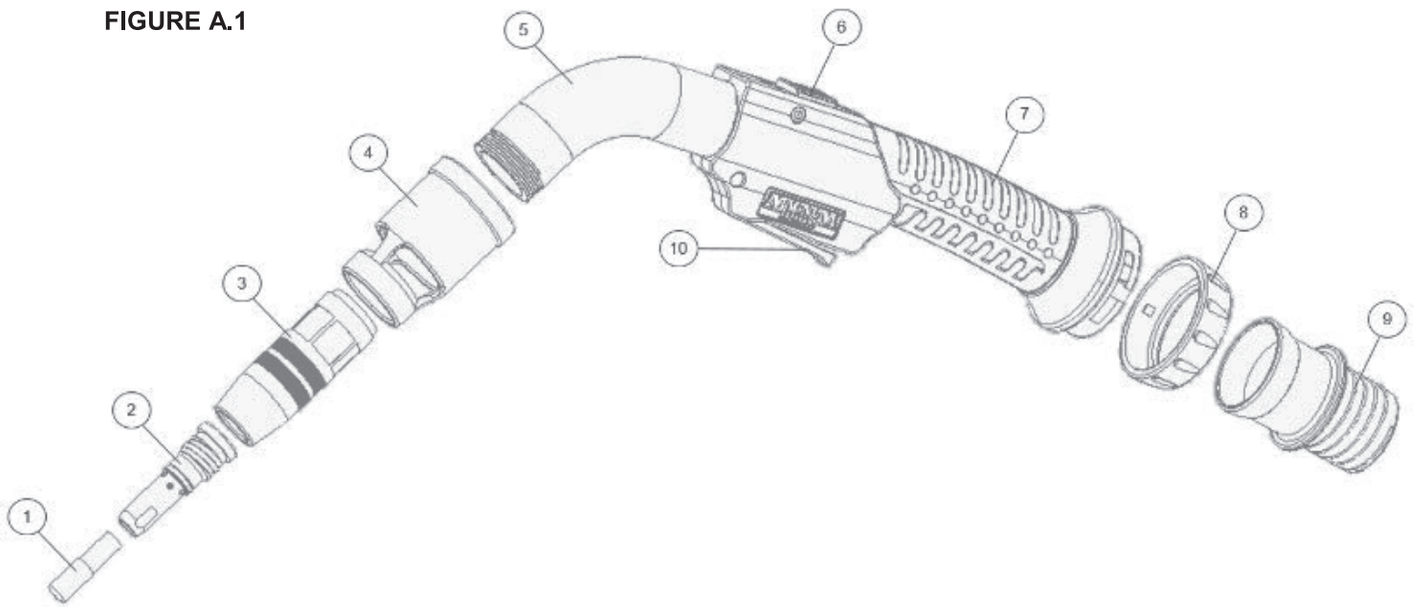
Do not touch electrically live parts such as output terminals or internal wiring.

WHAT'S INCLUDED

FRONT END (Figure A.1)

1. Contact tip.
2. Heavy- Duty Gas Diffuser.
3. Heavy-Duty Gas Nozzle Assembly.
4. Fume Collection Nozzle (GMAW version shown).
5. Fume tube.
6. Bypass.
7. Handles.
8. Locking Collar.
9. Ball Joint.
10. Trigger.

FIGURE A.1



FRONT END – INTERNAL PARTS (Figure A.2)

11. Gun Tube.
12. Spider.
13. Nut.
14. Cable Assembly.
15. Lining.

FIGURE A.2

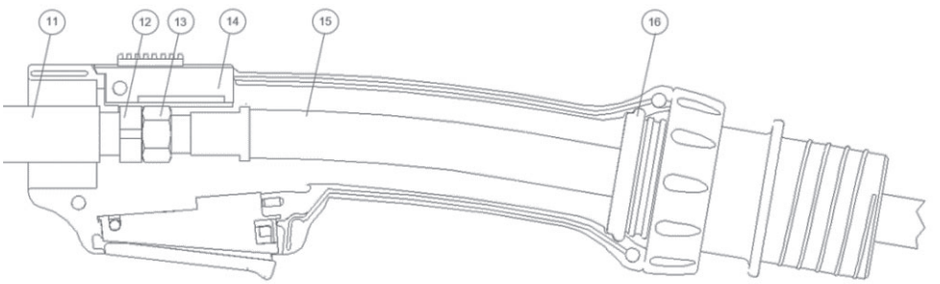
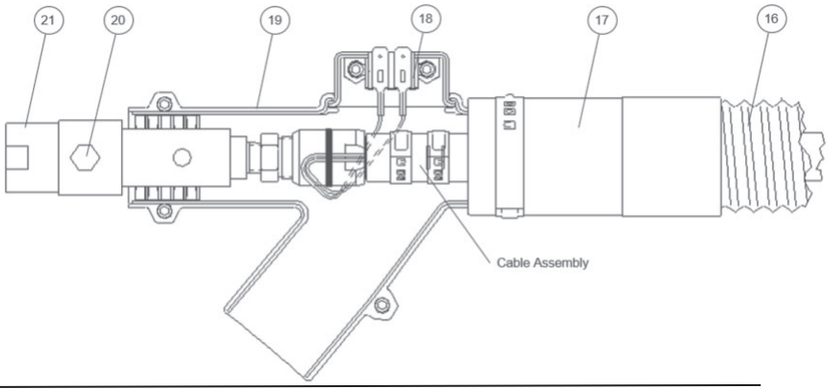


FIGURE A.3

FEEDER END (Figure A.3)
16. High Temperature Resistant Vacuum Hose.
17. Hose Adapter.
18. Modular Trigger Terminal Housing.
19. Vacuum Y Connection.
20. Gas Plug.
21. Incoming Connector Assembly.



SAFETY PRECAUTIONS

⚠ 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.**
- **Magnum™ Pro Fume Guns 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.**
- **Welding Machines, Wire Feeders, and Fume Extraction Equipment--Read and understand the equipments' instruction manuals and all hazard warnings on equipment and in the manuals.**
- **Personal Protective Equipment--Wear the proper personal protective equipment for welding, including but not limited to, safety glasses, hearing protection, protective footwear, welding helmet, welding gloves, and welding leathers.**

- **This product shall not be used in precipitation, or in wet or damp locations.**
- **Use these fume guns only with all consumable parts properly installed in place.**
- **Do not use these fume guns for arc-gouging.**

COMPATIBILITY OF WELDING MACHINES AND WIRE FEEDERS

1. If the welding process requires welding gas (FCAW- GS, GMAW, or MIG), then either the welding machine or feeder must be equipped with a gas solenoid valve to supply welding gas to the fume gun.
2. A gas mixer and regulator is required upstream of the gas solenoid valve to supply specified blends of welding gas at the specified flow rate.

PREPARING THE FUME GUN FOR WELDING

- Read all safety information: See the front of this instruction manual. Perform the following sections in the order shown.

Prepare the Welding Machine and Wire Feeder as follows:

1. Read all safety information in all related instruction manuals.
2. Disconnect input power to the machine and the wire feeder.
3. Machine and feeder polarity settings: Set to match the electrode's polarity requirement per the instruction manuals.
4. Gas selection: Connect gas supply to either the machine's or the feeder's gas solenoid valve. Set the gas mixer (if required) to the specified gas composition.
5. Gas flow rate: Set the supply regulator to deliver a gas flow rate of 50 to 70 SCFH thru the fume gun.

SELECT AND INSTALL A WIRE FEEDER CONNECTION K KIT

TABLE A.1 - GUN CONNECTOR KITS

Manufacturer	Wire Feeder Model	K466 Connector Kits (accept K44-series liner)	K613 Connector Kits (accept K445-series liner)
Lincoln Electric	LN-7, LN-8, & LN-9 series; LN-25 (0.052 max.); LN-742	K466-1	K613-1
	LN-7, LN-8, & LN-9 series; LN-25 (1/16 min.); LN-742	K466-8	K613-6
	LF-72, LN-74	K466-10	K613-7
	Series 10 feeders; LN-15; PF-10M; PF-15M	K466-10	K613-7
	Power MIG & Wirematic series feeders	K466-6	N/A
Tweco Adapted	No. 2, 3, and 4 guns	K466-2	K613-2
Miller	Intellimatic, Side Kick, D-51A, Porta-MIG, Millermatic 130, 300 & 35 S-42GL, S-52A & S-54A Swing Arc –Dual & Single, S-22, S-32S, 52D, 54D, 54E, 60 & 70 series	K466-3	K613-3
Hobart	Dualmatic 27/70, H3S, H4S, H6S Mega-Conds 27, 44, 45, 70, 70S	K466-4	K613-4

SELECT AND INSTALL GUN CONSUMABLE PARTS

TABLE A.2 - CONSUMABLES

Description Product Number	Cable Lenght	Wire Diameter	Contact tip	Gas Diffuser	Gas Nozzle	Cable Liner	Gun tube
K4463-2	15 ft	0.035	KP2745-035	KP2747-1	KP2743-1-62R	KP44-3545-15	KP5430-1
		0.045	KP2745-045				
		0.052	KP2745-052			KP44-116-15	
		1/16	KP2745-116				
K4464-2	15 ft	0.035	KP2745-035	KP2747-1	KP2743-1-62R	KP44-3545-15	KP5430-1
		0.045	KP2745-045				
		0.052	KP2745-052			KP44-116-15	
		1/16	KP2745-116				
		5/64	KP2745-564			KP44-564-15	
K4464-3	20 ft	0.035	KP2745-035	KP2747-1	KP2743-1-62R	KP44-3545-25	KP5430-1
		0.045	KP2745-045				
		0.052	KP2745-052			KP44-116-25	
		1/16	KP2745-116				
		5/64	KP2745-564			KP44-564-25	
K4464-4	25 ft	0.035	KP2745-035	KP2747-1	KP2743-1-62R	KP44-3545-25	KP5430-1
		0.045	KP2745-045				
		0.052	KP2745-052			KP44-116-25	
		1/16	KP2745-116				
		5/64	KP2745-564			KP44-564-25	

SELECT AND INSTALL A FUME NOZZLE

TABLE A.3 – FUME COLLECTION NOZZLES	
Welding Process	**Fume Nozzle**
GMAW	KP5430-2
FCAW-GS	KP5430-3
FCAW-SS	KP5430-4

Note. Gas nozzle must be used with all welding processes.

TABLE A.4 - AVAILABLE REPLACEMENT PARTS	
Description	**Replacement Part**
Vacuum Hose 15ft	9SS19947-31
Vacuum Hose 20ft	9SS19947-32
Vacuum Hose 25ft	9SS19947-33
Fume tube	9SM26806
Handles Asm	9SG9742
Cable 250A	9SL13336-5
Cable 350A 15ft	9SL13336-6
Cable 350A 20ft	9SL13336-7
Cable 350A 25ft	9SL13336-8

REMOVING FRONT END CONSUMABLES

a) Twist counter clockwise to unthread and remove the Fume Collection Nozzle (right-hand thread convention).

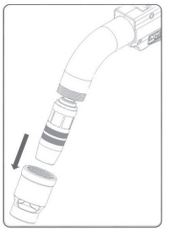


FIGURE A.4

b) Twist counter clockwise to begin removing the Heavy Duty Gas Nozzle (right-hand thread convention).

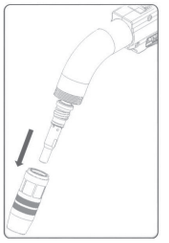


FIGURE A.5

c) Use the welding pliers to remove Contact Tip (right-hand thread convention).

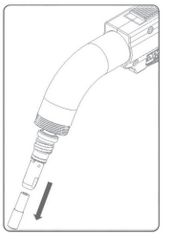


FIGURE A.6

d) Use a 7/16 inch wrench to remove the Heavy Duty Gas Diffuser. Installation torque: 41-47 in/lbs.

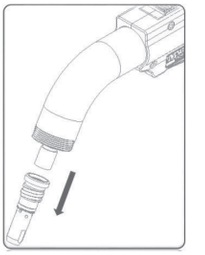


FIGURE A.7

Note. To remove Fume Tube, it is necessary to unscrew the handles.

SAFETY PRECAUTIONS

Read and understand this entire section before operating the machine.

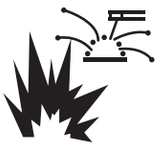
⚠ WARNING

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.**
- **Read and follow "Electric Shock Warnings" in the Safety section if welding must be performed under electrically hazardous conditions such as welding in wet areas or on or in the workpiece.**

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.

CONNECT THE GUN TO THE WIRE FEEDER

a) Make sure that the gun-locking knob is loosened. Insert the gun into the gun conductor block and tighten the gun-locking knob.

b)

c) Make the gas connection from the feeder to the gun (if required).

d) Plug the trigger harness into the gun's Y-connector. Plug the trigger harness' connector into the receptacle on the front of the feeder.

CONNECT THE GUN TO THE FUME COLLECTION SYSTEM

a) Plug the extractor into the gun's Y connector.

b) Automatic / Manual setting (where available): Set to "Manual" mode so that fume collection system will continue running after welding. This ensures maxi- mum cooling of the gun. Fume collection system or gate valve to the gun may be shut off or closed after the gun has cooled for 10 minutes since the last weld.

⚠ WARNING

WHEN USING AN OPEN ARC PROCESS, IT IS NECESSARY TO USE CORRECT EYE, HEAD, AND BODY PROTECTION.

LOAD SPECIFIED WIRE INTO THE GUN

1. Refer to welding wire literature for proper machine and feeder settings and proper usage.
2. Select specified welding wire.
3. Load specified welding wire into the feeder.
4. Connect the gun to the welding machine per the **Installation Section**.
5. Reconnect power to the welding machine and wire feeder.
6. Feed wire through the gun and contact tip. It may be necessary to temporarily remove the contact tip to feed wire. Reinstall the tip if it was removed.

MAKE THE WELD

1. Obtain and use the proper personal protective equipment for welding. See **Safety Precautions** in the **Installation Section and at the beginning of this Instruction Manual**.
2. Gun must include all consumables for proper welding.
3. Cut off the wire so that it extends about 1/4 inches from the contact tip.
4. Verify that the input power is connected to the machine and wire feeder.
5. Flip the machine's and feeder's power switches to "on".
6. Flip the fume extractor's power switch to "on". Set the extractor to the correct operating speed.
7. CTWD (contact tip to work distance) and push (GMAW) or drag (FCAW) angle: Read the filler wire instructions to determine the correct CTWD and angle values for the selected welding procedure and position the gun accordingly. The protruding welding wire should not contact the workpiece.
8. Protect the eyes and pull the trigger to begin welding.
9. Adjust the hand travel speed of the gun to achieve a proper weld. The emerging wire should stay within the molten puddle and not overrun it. This speed also should not be so slow that either the workpiece excessively melts, or that the weld bead becomes excessively large.
10. Release the trigger to stop welding.
11. Fume collection system or gate valve to the gun may be shut off or closed after the gun has cooled for 10 minutes since the last weld.

ACCESSORIES OR OPTIONS

TABLE A.5 - CONTACT TIPS

Wire Diameter	Standard Pkg. Qty.- 10	Standard Pkg. Qty.- 100	Life Extended Pkg. Qty.- 10	Life Extended Pkg. Qty.- 100
0.035	KP2745-035	KP2745-035-B100	KP2745-035R	KP2745-035R-B100
0.040	KP2745-040	KP2745-040-B100	NA	NA
0.045	KP2745-045	KP2745-045-B100	KP2745-045R	KP2745-045R-B100
0.052	KP2745-052	KP2745-052-B100	KP2745-052R	KP2745-052R-B100
1/16	KP2745-116	KP2745-116-B100	KP2745-116R	KP2745-116R-B100
0.068	KP2745-072	KP2745-072-B100	KP2745-072R	KP2745-072R-B100
5/64	KP2745-564	KP2745-564-B100	KP2745-564R	KP2745-564R-B100

ROUTINE CLEANING AND INSPECTIONS

a) Replace worn contact tips as required.

b) Remove spatter from inside of gas nozzle and from tip after each 10 minutes of arc time or as required.

c) Clean out fume collection nozzle and fume tube assembly.

d) Clean out the inside of the liner assembly.

e) Check that the gun tube and connector from cable assembly are properly tightened.

f) Replace any warning or product identification decals that have become illegible.

GAS DIFFUSER REPLACEMENT

This part may need to be replaced if it has accumulate excessive spatter and cannot be cleaned:

a) Remove fume collection nozzle, gas nozzle, and contact tip.

b) Install gas diffuser and thread into place in gun tube. Tighten diffuser to 41 to 47 in.-lbs. with wrench.

GUN TUBE REPLACEMENT

• Replace if worn from use; for example, if gas diffuser threads are deforming.

a) Remove consumables per section **Removing front-end parts, Installation section.**

b) Unscrew the handles and twist the collar counter clockwise. Pull collar and remove left handle.

c) Remove fume tube and gun tube from cable assembly.

d) Obtain a new replacement gun tube.

e) To reinstall, use spider to center gun tube inside handles and tighten the gun tube using the nut to 10 ft.-lbs. with wrench Reassemble gun.

f) Route the control leads inside of gun handle per section, **Trigger and Accessory Switch Lead Routing**. Be careful not to pinch any leads between gun handle halves.

LINER ASSEMBLY CLEANING OR REPLACEMENT

• Clean out old liner by straightening out the gun and gently blowing out the liner with shop air or obtain a new liner assembly.

• Replacement liner assemblies are factory-made to a length longer than the gun. Cutting is required.

a) Lay the gun and cable straight on a flat surface

b) Remove fume collection nozzle, gas nozzle, contact tip, and gas diffuser.

c) Make sure that the set screw in the connector end is backed out so as not to damage liner or liner bushing.

d) Insert a new untrimmed liner into the connector end of the cable. Be sure the liner bushing is stenciled appropriately for the wire size being used.

e) Be sure the cable is straight and then and insert a new untrimmed liner into the connector end of the cable.

f) Back out the set screw in the connector end and tighten manually.

g) Trim the liner 0.75 in from the top of the gun tube.

Remove any burrs from the end of the liner.

If needed replace the diffuser and gas nozzle

<OR>

For K466-3 CONNECTIONS:

Remove the connector cap with the wrench provided. Pull liner out of cable. If the liner is going to be replaced with a different size liner, loosen set screw on the connector cap and remove piece of liner material.

TRIGGER ASSEMBLY REPLACEMENT

- There are no serviceable or maintainable parts inside of the trigger.

a) Remove consumables per section **Removing front-end parts, Installation section.**

b) Unscrew the handles and twist the collar counter clockwise. Pull collar and remove left handle.

c) Slide trigger out of right handle half. Disconnect red and white leads from trigger. Use care to prevent damage to electrical leads and the terminals.

d) Connect red and white leads to the new trigger. Either lead may be connected to either trigger pin (non-polarized connections).

e) Slide new trigger into place and reassemble the gun. Be careful not to pinch any leads between gun handle halves.

GUN CABLE ASSEMBLY REPLACEMENT

a) Remove liner assembly per this section **Liner Assembly Cleaning or Replacement.**

b) Remove gun tube assembly per this section **Gun Tube Replacement**. Do not remove spider.

c) Disconnect gun cable's red and white control leads from trigger assembly.

d) Disconnect gun cable's blue and black control leads from optional accessory switch (if so equipped).

e) Disassemble the Y connector halves as follows. See Figure A.3 Installation Section as a guide:

- Disconnect the gun's Y connector from the vacuum source.
- Remove the gun's clamp from its hose adapter and slide off.
- Unthread hose fomo its adapters.
- Remove the 2 screws from the Y connector's modular trigger terminal housing.
- Remove the 3 screws from the Y connector.
- Separate the Y connector halves.
- Remove the modular trigger terminal housing halves and separate them.

f) Remove the two trigger terminals from the modular trigger terminal housing.

g) Remove the incoming connector assembly (see Item 21 Figure A.3, Installation Section) from the gun cable.

h) Remove the damaged gun cable by sliding it rear- ward from the vacuum hose.

i) Install the new gun cable by sliding it forward through the vacuum hose.

j) Reassemble gun by reversing steps, noting the following:

- Installation torques for both the incoming connector and gun tube assemblies: 10 to 12 ft.-lbs.
- The order of connection of the trigger terminals (red and white leads) to the trigger assembly or in the Y connector is unimportant (non-polarized connections).
- Reassemble the Y connector by reversing steps shown in e).
- Install a new liner if it does not meet the cut dimensional range given per this section **Liner Assembly Cleaning or Replacement**.

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 all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
No wire feed occurs when trigger is pulled	1. Machine is switched off or unplugged.	1. Switch on or plug in machine.
	2. Out of wire.	2. Install full spool of specified wire.
	3. Contact tip burnback.	3. Replace contact tip.
	4. Fully or partially blocked gun liner	4. Remove and clean or replace gun liner, (See Maintenance Section).
	5. Bird nest.	5. Cut out bird nest, reload wire, and check for proper wire alignment.
	6. Defective trigger (contacts open or dirty).	6. Replace trigger (See Maintenance Section)
	7. Defective trigger circuit in gun.	7. Disconnect gun from machine and check trigger circuit for continuity.
	8. No motor voltage or current from machine.	8. See Troubleshooting section in welding machine's or wire feeder's instruction manual.
	9. Contact tip size too small for wire diameter used.	9. Replace contact tip with one that is the correct size.
Sluggish wire feed when trigger is pulled	1. Drive roll is worn or galled.	1. Clean drive roll or replace drive roll.
	2. Machine's wire feed speed setting is too low.	2. Increase wire feed speed.
	3. Wire is obstructed somewhere along the wire feed path in the gun.	3. Check for obstructions: remove any wire shavings; remove kinked wire; remove and clean or replace gun tube liner (See Maintenance Section).
	4. Low motor voltage.	4. See Troubleshooting section in welding machine's instruction manual.

⚠ 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 all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Poor fume extraction.	1. Fume powder deposits are blocking off gun passages at the fume collection nozzle or fume tube.	1. Remove the powdered deposits.
	2. Excessive air currents.	2. Block off air drafts.
	3. Gun has excessive air leaks.	3. Check for loose hose clamps or detached hoses.
	4. Fume extraction equipment is switched off.	4. Switch on or plug in extraction equipment.
	5. Fume extraction equipment is non-functional.	5. See Troubleshooting section in extractor's instruction manual.
	6. Fume extraction equipment has blocked filters.	6. Clean or replace filters per equipment instructions.
	7. Vacuum hose is partially or completely flattened or blocked.	7. Attempt to straighten out hose or remove blockage; otherwise replace hose.
	8. Vacuum hose is punctured or torn.	8. Punctures: Patch hose with tape Tears: Replace hose.

⚠ 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 all Safety Guidelines detailed througout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS	RECOMMENDED COURSE OF ACTION
Frequent occurrence of contact tip burnback.	1. Improper welding parameters or technique (example: ESO is too short).	1. See welding wire literature for proper settings
	2. Wire may be feeding intermittently.	2. See symptoms on intermittent or sluggish wire feed
Poor weld bead appearance (porosity or dull gray oxidized surface).	1. No gas flow.	1. See symptom “Low or no gas flow”.
	2. Low gas flow.	2. See symptom “Low or no gas flow”.
	3. Improper or contaminated shielding gas.	3. Check that the gas supply’s labeling reads 100% argon. Temporarily use alternate, known gas supply and check for appearance improvement.
	4. Welding in a windy environment.	4. Erect a wind shield or move to a non-windy location before welding
	5. Improper electrode polarity.	5. Reconnect machine’s welding output to proper electrode polarity
	6. Improper welding parameters or technique	6. See welding wire literature for proper settings

⚠ 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 all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
PROBLEMS		
Low or no shielding gas flow.	1. Out of gas.	1. Check that an adequate gas supply is available.
	2. Gas supply is turned off or disconnected.	2. Check that all gas supply valves are open.
	3. Gas supply flow regulator is improperly set.	3. Check that gas flow is set between 50 to 70 SCFH.
	4. Machine's gas solenoid valve has malfunctioned.	4. See machine's instruction manual.
	5. Blockage in gun along gas path.	5. Gently blow out debris from core tube.
	6. Gun cable kinked or flattened.	6. Attempt to straighten out cable, or replace cable.
	7. Blockage due to excessive spatter accumulation on gas cone or gas diffuser.	7. Clean or replace gas cone or gas diffuser.
	8. Excessive gas leakage from supply.	8. Find and repair all leaks.
Wire feeder runs or begins feeding wire without pulling the gun trigger.	1. Defective trigger, (contacts closed or dirty).	1. Replace trigger. (See Maintenance Section).
	2. Defective (closed) trigger circuit in the welding machine.	2. See machine's instruction manual
	3. Trigger lead(s) inside gun cable are shorted together or commonly shorted to either welding or accessory switch circuits	3. Damaged control leads along cable; repair if possible. Otherwise, replace gun cable.

⚠ 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.

			
WARNING	• Do not touch electrically live parts or electrode with skin or wet clothing. • Insulate yourself from work and ground.	• Keep flammable materials away.	• Wear eye, ear and body protection.
Spanish **AVISO DE PRECAUCION**	• No toque las partes o los electrodos bajo carga con la piel o ropa mojada. • Aislese del trabajo y de la tierra.	• Mantenga el material combustible fuera del área de trabajo.	• Protéjase los ojos, los oídos y el cuerpo.
French **ATTENTION**	• Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. • Isolez-vous du travail et de la terre.	• Gardez à l'écart de tout matériel inflammable.	• Protégez vos yeux, vos oreilles et votre corps.
German **WARNUNG**	• Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! • Isolieren Sie sich von den Elektroden und dem Erdboden!	• Entfernen Sie brennbarres Material!	• Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese **ATENÇÃO**	• Não toque partes elétricas e electrodos com a pele ou roupa molhada. • Isole-se da peça e terra.	• Mantenha inflamáveis bem guardados.	• Use proteção para a vista, ouvido e corpo.
Japanese **注意事項**	● 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。 ● 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。	● 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。	● 目、耳及び身体に保護具をして下さい。
Chinese **警 告**	● 皮肤或濕衣物切勿接觸帶電部件及銲條。 ● 使你自己與地面和工件絕緣。	● 把一切易燃物品移離工作場所。	● 佩戴眼、耳及身體勞動保護用具。
Korean **위 험**	● 전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	● 인화성 물질을 접근 시키지 마시요.	● 눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic **تحذير**	● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجلد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل.	● ضع المواد القابلة للاشتعال في مكان بعيد.	● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

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.

			
• Keep your head out of fumes. • Use ventilation or exhaust to remove fumes from breathing zone.	• Turn power off before servicing.	• Do not operate with panel open or guards off.	**WARNING**
• Los humos fuera de la zona de respiración. • Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.	• Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	• No operar con panel abierto o guardas quitadas.	Spanish **AVISO DE PRECAUCION**
• Gardez la tête à l'écart des fumées. • Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	• Débranchez le courant avant l'entretien.	• N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French **ATTENTION**
• Vermeiden Sie das Einatmen von Schweibrauch! • Sorgen Sie für gute Be-und Entlüftung des Arbeitsplatzes!	• Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	• Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German **WARNUNG**
• Mantenha seu rosto da fumaça. • Use ventilação e exhaustão para remover fumo da zona respiratória.	• Não opere com as tampas removidas. • Desligue a corrente antes de fazer serviço. • Não toque as partes elétricas nuas.	• Mantenha-se afastado das partes moventes. • Não opere com os paineis abertos ou guardas removidas.	Portuguese **ATENÇÃO**
● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。	● 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って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	Japanese **注意事項**
●頭部遠離煙霧。 ●在呼吸區使用通風或排風器除煙。	●維修前切斷電源。	●儀表板打開或沒有安全罩時不準作業。	Chinese **警 告**
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean **위 험**
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic **تحذير**

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説明以及應該使用的銀焊材料，並請遵守貴方的有関勞動保護規定。

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.

CUSTOMER ASSISTANCE POLICY

The business of Lincoln Electric is manufacturing and selling high quality welding equipment, automated welding systems, consumables, and cutting equipment. Our challenge is to meet the needs of our customers, who are experts in their fields, and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or technical information about their use of our products. Our employees respond to inquiries to the best of their ability based on information and specifications provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment, or to provide engineering advice in relation to a specific situation or application. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or communications. Moreover, the provision of such information or technical information does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or technical information, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose or any other equivalent or similar warranty is specifically disclaimed.

Lincoln Electric is a responsive manufacturer, but the definition of specifications, and the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

WELD FUME CONTROL EQUIPMENT

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.

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