

IM3050  
05/2016  
REV07

# COOL ARC<sup>®</sup> 47

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## OPERATOR'S MANUAL



ENGLISH

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**LINCOLN<sup>®</sup>**  
**ELECTRIC**

**THE LINCOLN ELECTRIC COMPANY**  
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12/05

**THANKS!** For having chosen the QUALITY of 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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## 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 Material Safety Data Sheet (MSDS) 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.**



# Safety



## WARNING



### CALIFORNIA PROPOSITION 65 WARNINGS

#### Diesel Engines

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

#### Gasoline Engines

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




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

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

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



## FOR ENGINE POWERED EQUIPMENT.

- 1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running. 
- 1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.
- 1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated. 
- 1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment. 

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

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

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

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



## ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS



- 2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines
- 2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.
- 2.c. Exposure to EMF fields in welding may have other health effects which are now not known.
- 2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:
  - 2.d.1. Route the electrode and work cables together – Secure them with tape when possible.
  - 2.d.2. Never coil the electrode lead around your body.
  - 2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.
  - 2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.
  - 2.d.5. Do not work next to welding power source.



## ELECTRIC SHOCK CAN KILL.



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



## ARC RAYS CAN BURN.



- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.

- 4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- 4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



## FUMES AND GASES CAN BE DANGEROUS.



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



## 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-1, "Precautions for Safe Handling of Compressed Gases in Cylinders", available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.



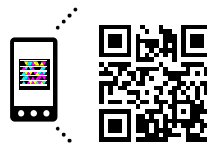
## FOR ELECTRICALLY POWERED EQUIPMENT.



- 8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- 8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- 8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

### Refer to

<http://www.lincolnelectric.com/safety>  
for additional safety information.



Welding Safety  
Interactive Web Guide  
for mobile devices

Get the free mobile app at  
<http://gettag.mobi>

## Introduction

The **COOL ARC® 47** is a cooling system designed for use with water-cooled torches and guns:

- GTAW torches
- GMAW guns up to 500A.

The following equipment is included with the **COOL ARC® 47**:

- Hose with quick water connector – 7,874in (0,2m).

## Unpacking the COOL ARC® 47

The packaging of the Cooler is designed to withstand shipping abuse, and contains a cardboard liner that surrounds the unit. If any shipping damage has occurred, contact your certified Lincoln distributor or service center. When unpacking the unit, avoid thrusting sharp objects through the carton liner, which may puncture the plastic reservoir. Save the instruction manual supplied with the **COOL ARC® 47** for parts others and future maintenance service.

## Installation on Power Source

The **COOL ARC® 47** is designed to mount directly to the bottom of a Aspect 275 or Aspect 375 power source. Always place the **COOL ARC® 47** on a level surface to avoid causing the machine to topple over.

The **COOL ARC® 47** is delivered empty with no coolant in the system. It is recommended to use KP4159-1 low conductivity coolant.

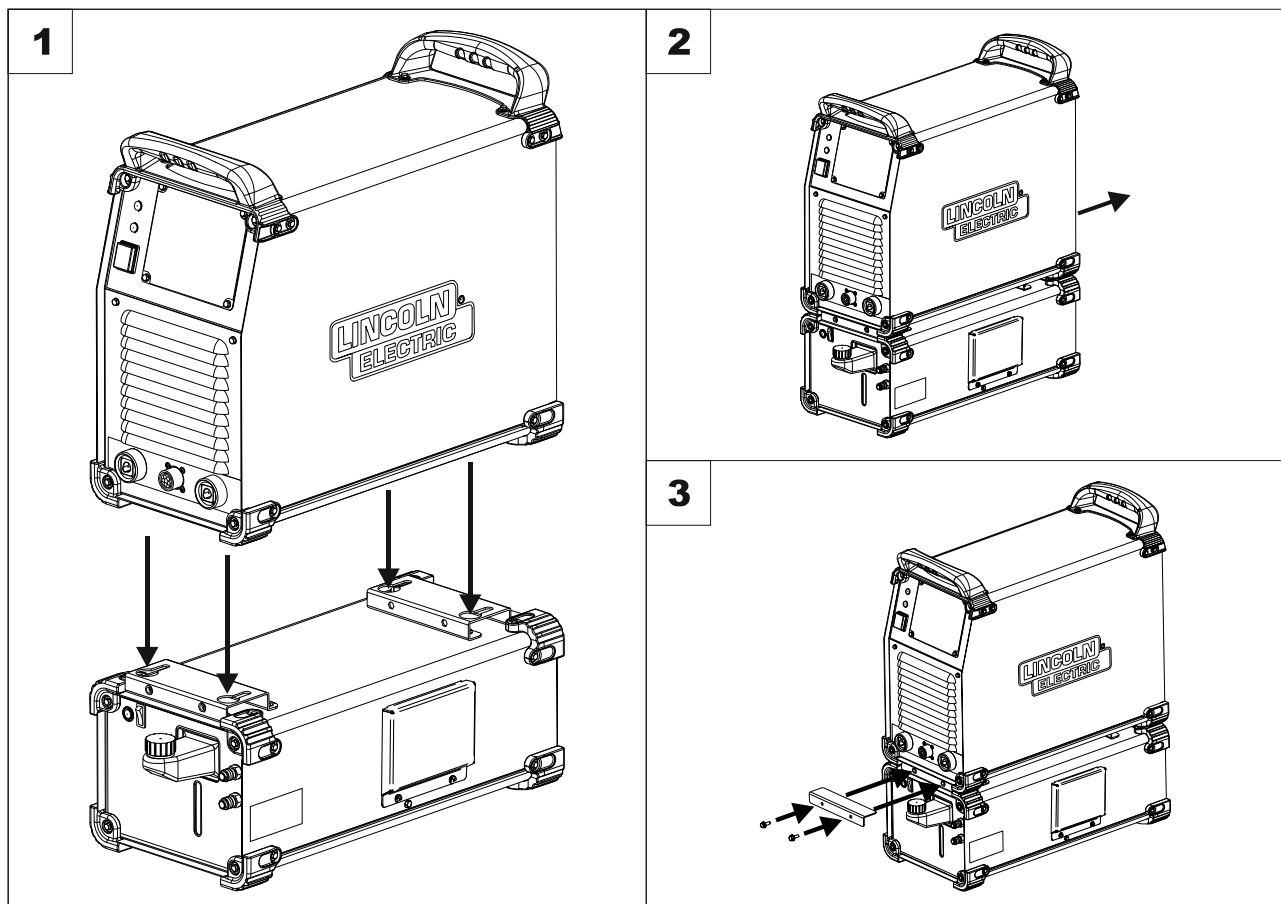


Figure 1

# Installation and Operator Instructions

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

This machine will operate in harsh environments. However, it is important that simple preventative measures are followed to assure long life and reliable operation:

- Do not place or operate this machine on a surface with an incline greater than 15° from horizontal.
- Do not use this machine for pipe thawing.
- This machine must be located where there is free circulation of clean air without restrictions for air movement to and from the air vents. Do not cover the machine with paper, cloth or rags when switched on.
- Dirt and dust that can be drawn into the machine should be kept to a minimum.
- This machine has a protection rating of IP23. Keep it dry, shelter it from rain & snow and do not place it on wet ground or in puddles.
- Locate the machine away from radio controlled machinery. Normal operation may adversely affect the operation of nearby radio controlled machinery, which may result in injury or equipment damage. Read the section on electromagnetic compatibility in this manual.
- Do not operate in areas with an ambient temperature greater than 104°F (40°C).

## Recommended power source

The **COOL ARC® 47** is designed for use with water-cooled guns and torches. The **COOL ARC® 47** can be used with power sources:

- Aspect 275
- Aspect 375.

## Input Supply Connection

The **COOL ARC® 47** should be supplied by a welding power source using a NEMA 5-15R receptacle. To connect the input supply to the **COOL ARC® 47**, turn off the power to the welding power source and disconnect it from the input supply. The allowable input voltage is 115V, 60Hz. Make sure that the supply voltage of the unit matches the cooler's rated voltage.

### WARNING

Do not switch on the welding power source with the cooler connected if the reservoir was not filled and the torch's/gun's hoses are disconnected from the cooling unit. Not observing this warning may cause internal damage to the cooler unit.

## Controls and Operational Features

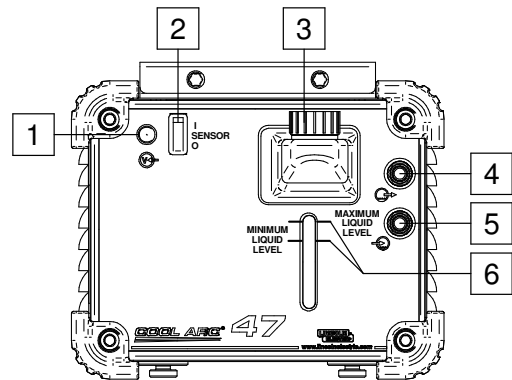



Figure 2



1. **Power Indicator Light:** This lamp will light up to indicate that the cooler is supplied by the power source.
2. **Flow Sensor Switch:** The Cool Arc 47 comes equipped with a flow sensor that triggers an error code at the machine to protect the TIG Torch from over-heating when inadequate coolant flow is detected through the flow sensor. The Error Code fault (Error 11) could indicate a possible kink in the torch lines, damage and/or a leak in the TIG Torch coolant lines, or signal the need to use a TIG Torch that is of a higher amperage capacity and rating. The flow sensor can be turned ON or OFF, but is set to a default ON position when first powered on out of the box.
 

 **WARNING**

Incorporated into the cooler is an automatic flow sensor to detect low or no coolant flow. A low or no flow condition will cause welding output to automatically stop to protect the torch.
3. **Reservoir for Coolant with Cap:** The translucent reservoir enables control of volume of the coolant.
4. **Quick Connect Coupling:** Coolant outlet (supplies cool coolant to the torch/gun).
5. **Quick Connect Coupling:** Coolant inlet (takes warm coolant from torch/gun).
6. **Minimum and maximum Liquid Level:** Determine the level of coolant in which the cooler can work.



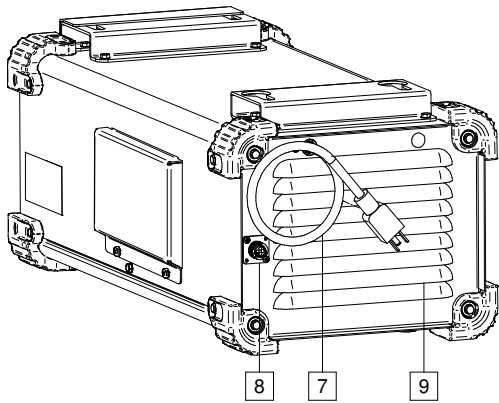


Figure 3

- 7. Power Lead with NEMA 5-15 Plug.
- 8. Control Receptacle: To exchange information between the cooler and a power source.
- 9. Airflow Slots: Enable proper circulation of air cooling (Figure 4).

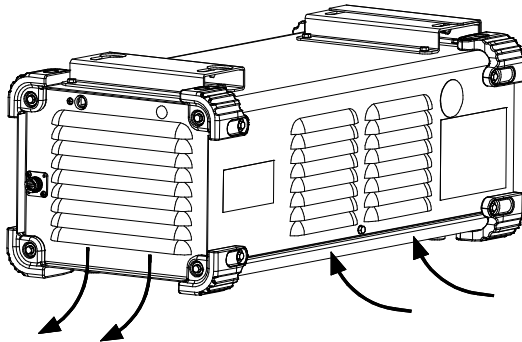


Figure 4.

**! WARNING**

Moving parts can injure. Never place fingers into the openings of the Cooler.

**! WARNING**

Avoid placing the cooler near a flux hopper or an area where dust build-up is extreme.

**Circulation of Coolant in the Cooler**

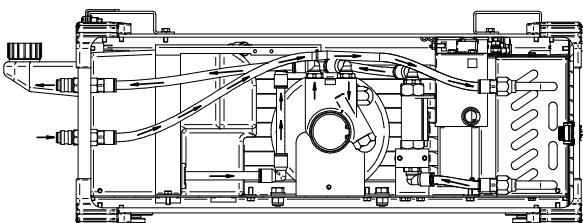


Figure 5.

**Warning:** The ambient air temperature influences the parameters of cooling. If the ambient temperature is higher, the cooling system will be less effective.

**! WARNING**

Avoid placing the cooler near areas of extreme heat.

**! WARNING**

Avoid kinking or putting sharp bends in any water lines.

**! WARNING**

Never operate the cooler with case off.

**Coolant and Filling the Reservoir**

**! WARNING**

Before filling the coolant reservoir, disconnect cooler's power lead to the power source.

**! WARNING**

Avoid contact with coolant. Wear waterproof gloves and protective eye wear.

**Warning:** The cooler can be filled and used only in the horizontal position.

Use KP4159-1 low conductivity coolant.

**Do not use** pre-packaged welding industry coolants. These coolants may contain oil-based substances, which attack the plastic components of the cooler. Once added to the cooler, these substances are impossible to purge from the water lines and heat exchanger.

**Do not use** automotive anti-freeze. These coolants will damage the pump and block of the heat exchanger, affecting cooling performance.

**! WARNING**

The coolant reservoir can be filled with a maximum of 1,58 gal (6 liters) of coolant. A minimum of 1,06 gal (4l) of coolant has to be poured into the reservoir.

**! WARNING**

Never operate the cooler with the reservoir empty.

**! WARNING**

Do not start the cooler with less than 1,06 gal (4 liters) of coolant. Operating without enough coolant can prevent full priming of the system and may damage the pump.

## Priming Pump (only for first time use) and Bleeding the Cooling System

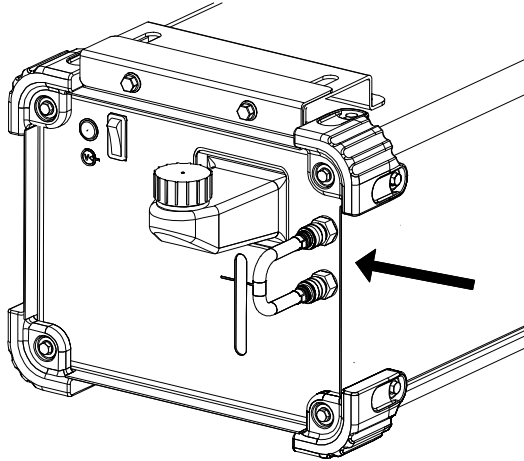


Figure 6.

- Assemble the welding setup.
- Connect the short hose with quick water connectors (included with the equipment) to the cooler's inlet and outlet sockets (Figure 6).
- Fill the coolant reservoir – minimum 1,06 gal (4 liters).
- Remove the reservoir cap.

### **WARNING**

During the first use of the **COOL ARC® 47**, the reservoir cap must be removed to avoid generating a partial vacuum in the cooling system while priming the pump.



- Turn the power source on.
- Wait 30 seconds until the coolant fully circulates through the cooling system and returns into the reservoir.
- Turn the power source off.
- Disconnect the short hose with quick water connectors.
- Connect the torch water-cooler hoses – Figure 7.
- Turn the power source on.
- Wait 30 seconds until the coolant fully circulates the cooling system and returns into the reservoir.
- Tighten the cap.

### **WARNING**

After priming the pump and/or bleeding the cooling system, be sure the reservoir's cap is tightened. Operating the cooler without the cap tightened, can cause poor cooling efficiency, evaporation loss of coolant, and low product life.

- The welding set is ready to work.

## Connecting the Cooling System Hoses

- The power source has to be turned off.
-  Connect the "inlet" hose of torch/gun (colored or tagged blue on most hoses) into the outlet quick connect coupling [4] located on the front panel of the cooler.
-  Connect the "outlet" hose of torch/gun (colored or tagged red on most hoses) into the inlet quick connect coupling [5] located on the front panel of the cooler.

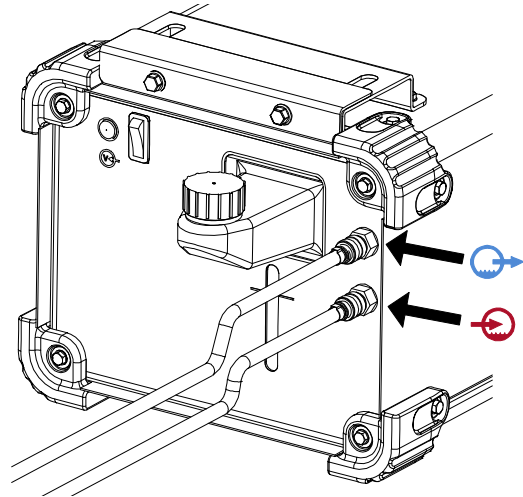


Figure 7.

**Warning:** The water-cooler hoses are connected into the quick connect coupling type 21KATS09MPX (see "Spare parts" section), which automatically close when hoses are disconnected.

Before installing the hoses to the cooler, you should check if the hose connectors match the quick connect couplings located on the front panel of the cooler.

### **WARNING**

Avoid kinking or putting sharp bends in any water lines.

### **WARNING**

Keep all water lines clean and free of any blockage.

### **WARNING**

Keep the reservoir full especially after changing any water lines.

## Transport

To avoid freeze damage and water leakage during transport, the coolant must be removed from the cooler's reservoir.

## Maintenance



### WARNING

For any repair operations, modifications or maintenance, it is recommended to contact the nearest Technical Service Center or Lincoln Electric. Repairs and modifications performed by unauthorized service or personnel will cause the manufacturer's warranty to become null and void.

Any noticeable damage should be reported immediately and repaired.

### Routine maintenance

- Check the condition of water-cooler hoses and connections of the power lead.
- Check the welding torch / gun condition: replace it, if necessary.
- Check condition and operation of the cooling fan. Keep its airflow slots clean.
- The reservoir volume should be checked daily before using the cooler!!
- Keep the reservoir full, especially after disconnecting the water lines or changing the accessory being cooled.

### Periodic maintenance (not less than once a year)

Perform the routine maintenance and, in addition:

- Keep the machine clean. Using a dry (and low pressure) airflow, remove the dust from the external case and from the heat exchanger inside.
- In dirty or dusty environments or if biological growth occurs in the coolant, it may be necessary to flush the coolant reservoir. Drain the old coolant, rinse the inside of the reservoir and circulate rinsing solution through the coolant system. Add new coolant when cleaning is finished.



### WARNING

Hot coolant can burn skin. Always be sure coolant is NOT HOT before servicing the cooler.



### WARNING

Special precautions have to be taken when the coolant is removed from the cooler reservoir. The coolant must not be poured out into ground water, sewerage, or soil. Read "Material Safety Data Sheet" (coolant used) and contact the local Department of Environmental Protection office to obtain information on recycling coolant.

The frequency of the maintenance operations may vary in accordance with the working environment where the machine is placed.



### WARNING

Do not touch electrically live parts.



### WARNING

Before the case of machine will be removed, the machine has to be turned off and the power lead has to be disconnected from mains socket.



### WARNING

Mains supply network must be disconnected from the machine before each maintenance and service. After each repair, perform proper tests to ensure safety.

### Pump maintenance

- The pump head has a "built in" strainer on the inlet side of the pump. It is recommended to clean or replace the pump's inlet strainer at least once a year.
- Drain the coolant reservoir and all coolant lines. Dispose of the coolant properly as specified above.
- Remove the pump cover to expose the pump head.
- Hold the pump head firmly to apply a counter-torque when loosening the strainer's 7/8" acorn nut located on the bottom. Do not confuse with 3/4" acorn nut. Remove nut and slide inlet strainer down and out from the pump head.
- Gently rinse the strainer under running water to thoroughly clean it.
- Use a mirror to inspect the inside of the pump for contamination. Carefully remove hardened debris with a dental pick if necessary, without scratching the inside of the pump. Use care not to drop debris into pump.
- Reinstall the strainer and 7/8 acorn nut, tightening with 75+/-15 in-lbs. of torque. Wipe dry all area wetted with coolant. Dispose of coolant soaked towels properly as specified above.

### Pump motor

It is recommended to re-oil the pump motor bearings once a year as follows:

- Remove the plastic plugs located on the top of both the inboard and outboard bearing end-caps.
- Re-oil each bearing with 30-35 drops of SAE 20 oil then reinstall both plugs.

### Pump inlet strainer

Poor cooler performance can usually be traced to a partially or completely blocked pump inlet strainer. This is a user-serviceable item and can be cleaned and reused, or replaced.

Continued pump operation with a blocked strainer can cause:

- Voiding of cooler service warranty
- Cavitation damage to the pump head's inlet areas
- Welding accessory damage from overheating due to insufficient coolant flow rate.

A new or properly cleaned pump inlet strainer should restore the cooler's performance.

## Troubleshooting

This Troubleshooting Guide is designed to be used by the machine Owner/Operator. 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, please observe all safety notes and precautions detailed in the Safety Section of this manual to avoid electrical shock or danger while troubleshooting this equipment.

### WARNING

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the nearest authorized Technical Service Center or Lincoln Electric for technical troubleshooting assistance before you proceed.

PROBLEMS	POSSIBLE CAUSE	RECOMMENDED CORRECTIVE ACTION
Cooler does not operate.	<ul style="list-style-type: none"> <li>Power lead unplugged.</li> <li>No power at outlet.</li> <li>Power lead is damaged.</li> <li>Water lines blocked or crimped.</li> <li>Leak in gun or water hoses.</li> <li>Reservoir empty.</li> </ul>	<ul style="list-style-type: none"> <li>Plug in power lead.</li> <li>Check outlet circuit breaker.</li> <li>Repair damaged lead or order new lead set.</li> <li>Clear blockage in hose. Avoid kinking or putting sharp bends in water lines.</li> <li>Repair leak.</li> <li>Fill reservoir.</li> </ul>
Internal water leak.	<ul style="list-style-type: none"> <li>Hose clamp loose on one of internal hoses.</li> <li>Internal hose punctured.</li> <li>Heat exchanger leaking.</li> </ul>	<ul style="list-style-type: none"> <li>Tighten or replace hose clamp.</li> <li>Replace punctured hose with new hose.</li> <li>Replace heat exchanger.</li> </ul>
Leak at inlet/outlet connector block.	<ul style="list-style-type: none"> <li>Hose clamp loose.</li> </ul>	<ul style="list-style-type: none"> <li>Tighten hose clamp onto hose.</li> </ul>
Torch or gun runs hot.	<ul style="list-style-type: none"> <li>Unit placed by area of extreme heat.</li> <li>Fan not operating.</li> </ul>	<ul style="list-style-type: none"> <li>Move unit away from hot air.</li> <li>Reference fan section.</li> </ul>
Fan operates but there is low coolant flow.	<ul style="list-style-type: none"> <li>Leak in torch/gun or hoses.</li> <li>Torch/gun or hoses partially obstructed.</li> <li>Reservoir empty or very low.</li> </ul>	<ul style="list-style-type: none"> <li>Repair leak.</li> <li>Clear obstruction.</li> <li>Refill reservoir.</li> </ul>
Fan operates but there is no coolant flow.	<ul style="list-style-type: none"> <li>Pump failure.</li> <li>Pump seized.</li> </ul>	<ul style="list-style-type: none"> <li>Replace pump.</li> <li>Replace pump.</li> </ul>
Pump operates, but fan does not.	<ul style="list-style-type: none"> <li>Fan blade contacting heat exchanger.</li> <li>Fan motor failure.</li> </ul>	<ul style="list-style-type: none"> <li>Replace fan.</li> <li>Replace fan.</li> </ul>
Cooler trips outlet circuit breaker.	<ul style="list-style-type: none"> <li>Circuit overloaded.</li> <li>Cooler electrical component failure.</li> </ul>	<ul style="list-style-type: none"> <li>Check outlet circuit breaker.</li> <li>Replace electrical component.</li> </ul>
Weld output disabled	<ul style="list-style-type: none"> <li>Low or no coolant flow.</li> <li>Faulty flow sensor.</li> </ul>	<ul style="list-style-type: none"> <li>Fill reservoir.</li> <li>Replace flow sensor.</li> </ul>

## 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.

### **WARNING**

The Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.

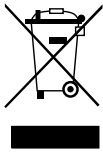
## Technical Specifications

NAME		INDEX		
COOL ARC <sup>®</sup> 47		K3950-1		
INPUT				
	Input Voltage U <sub>1</sub>	Input Amperes I <sub>1max</sub>		
COOL ARC <sup>®</sup> 47	115 V ± 10%	5,3 A		
	Frequency	EMC Class		
COOL ARC <sup>®</sup> 47	60 Hz	A		
PARAMETERS RATING				
	The cooling power of flow 1liter per minute at temperature of 77 °F (25 °C)	Maximum pressure rate		
COOL ARC <sup>®</sup> 47	2 kW	62 psig (0,43 MPa)		
PARAMETERS OF THE COOLER'S RESERVOIR				
	Maximum reservoir capacity	Minimum required reservoir capacity		
COOL ARC <sup>®</sup> 47	1,58 gal (6 liters)	1,06 gal (4 liters)		
COOLANT				
COOL ARC <sup>®</sup> 47	Recommended coolant	KP4159-1 low conductivity coolant		
COOL ARC <sup>®</sup> 47	Do not use!!	Pre-packaged welding industry coolants. These coolants may contain oil-based substances, which attack the plastic components of the cooler. Once added to the cooler, these substances are impossible to purge from the water lines and heat exchanger.		
		Automotive anti-freeze. These coolants will damage the pump and block of the heat exchanger, affecting cooling performance.		
PHYSICAL DIMENSIONS				
	Weight	Height	Width	Length
COOL ARC <sup>®</sup> 47	53,5 lb (24,5 kg)	10,04 in (255 mm)	11,938 in (303 mm)	27,56 in (700 mm)
	Protection Rating	Operating Humidity (t=68 °F=20 °C)	Operating Temperature	Storage Temperature
	IP23	≤ 90 %	from 14 °F to 104 °F (from -10 °C to +40 °C)	from -13 °F to 131 °F (from -25 °C to +55 °C)

## WEEE

07/06

English



Do not dispose of electrical equipment together with normal waste!

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.

By applying this European Directive you will protect the environment and human health!

## Spare Parts

12/05

### Part list reading instructions

- 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.
- Use the illustration of assembly page and the table below to determine where the part is located for your particular code machine.
- Use only the parts marked "●" in the column under the heading number called for in the assembly page (# indicate a change in this printing).

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

# Electrical Schematic

