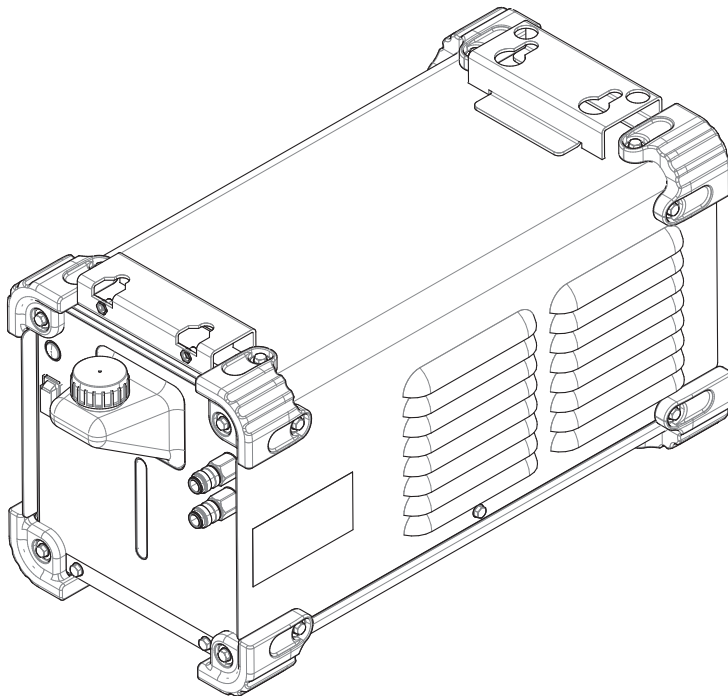


Operator's Manual

Cool Arc[®] 22



For use with machines having Code Numbers:

12733



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)

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.

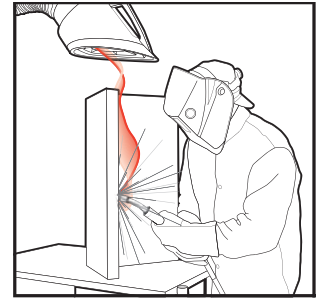
READ and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

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.P65warnings.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 W117.2-1974. 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 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-1, "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.

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PARTS LISTPARTS.LINCOLNELECTRIC.COM
 CONTENT/DETAILS MAY BE CHANGED OR UPDATED WITHOUT NOTICE. FOR MOST CURRENT INSTRUCTION MANUALS, GO TO
 PARTS.LINCOLNELECTRIC.COM.

TECHNICAL SPECIFICATIONS - K3475-1 COOL ARC 22

INPUT	
INPUT VOLTAGE U_1	INPUT AMPERES I_{1MAX}
390 Vdc	0.8 A

PARAMETERS RATING	
THE COOLING POWER OF FLOW 1 LITER PER MINUTE AT TEMPERATURE OF 77°F (25°C)	MAXIMUM PRESSURE RATE
0.87 kW*	62 psig (0.43 MPa)

PARAMETERS OF THE COOLER'S RESERVOIR	
MINIMUM RESERVOIR CAPACITY	MAXIMUM RESERVOIR CAPACITY
0.4 gallons	0.6 gallons

COOLANT	
RECOMMENDED COOLANT	
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 the heat exchanger, affecting cooling performance.	

PHYSICAL DIMENSIONS			
Height	Width	Depth	Weight
10.87 in (276 mm)	9.68 in (246 mm)	21.26 in (540 mm)	39 lb (18 kg)

TEMPERATURE RANGES	
OPERATING TEMPERATURE RANGE	STORAGE TEMPERATURE RANGE
from 14 °F to 104 °F (from -10 °C to +40 °C)	from -13 °F to 131 °F (from -25 °C to +55 °C)

PROTECTION RATING	OPERATING HUMIDITY (T=68°F=20°C)
IP23	≤ 90 %

* The correction factor for cooling power in a +40°C ambient is .575.

UNPACKING THE COOL ARC® 22

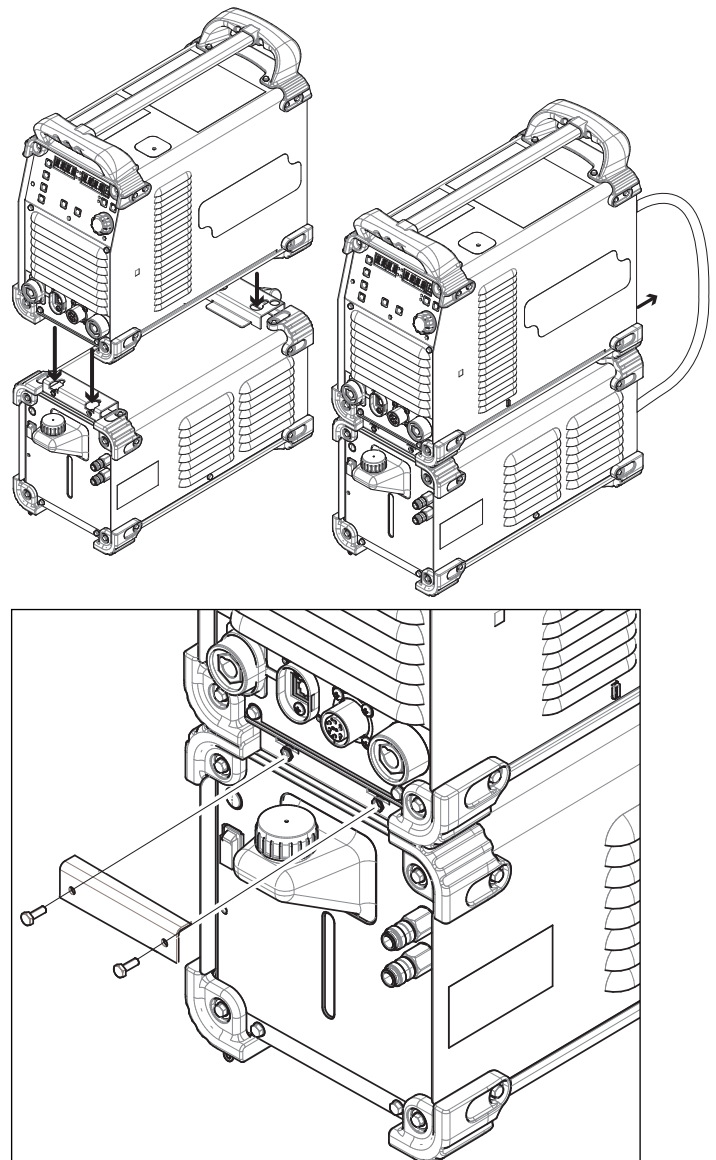
The packaging of the Cooler is designed to withstand shipping abuse. If any shipping damage has occurred, contact your certified Lincoln Electric distributor or service center. When unpacking the unit, avoid thrusting sharp objects through the carton liner, which may puncture the plastic reservoir. Save this instruction manual for parts orders and future maintenance service.

INSTALLATION ON POWER SOURCE

The Cool Arc® 22 is designed to mount beneath a Lincoln Electric TIG welding power source that lists the Cool Arc 22 as an approved accessory.

Always place the Cool Arc® 22 on a level surface to avoid toppling. Once mounted to a machine, the assembly can be mounted to the K4441-1 two wheel cart.

FIGURE 1



OPERATION

SAFETY PRECAUTIONS

Read this entire section of operating instructions before operating the machine.

WARNING

ELECTRIC SHOCK can kill.

- Do not operate with covers removed.
- Do not operate if cables are wet or immersed in water.



MOVING PARTS can injure.

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



HOT COOLANT can burn skin.

- Always be sure coolant is NOT HOT before servicing the cooler.



Do not pour used ethylene glycol coolant down the drain.



Observe additional guidelines detailed in the beginning of this manual.

GENERAL DESCRIPTION

The Cool Arc® 22 is a cooling system designed to work specifically with Lincoln Electric TIG welding power sources.

Included Accessories:

- 8-inch jumper hose with quick water connector

The Cool Arc® 22 is delivered empty with no coolant in the system. Lincoln Electric KP4159-1 low conductivity coolant is recommended.

LOCATION

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

- Do not place or operate this cooler on a surface with an incline greater than 15° from horizontal.
- The cooler 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 cooler with paper, cloth or rags when switched on.
- Dirt and dust that can be drawn into the cooler should be kept to a minimum.

- This cooler 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 cooler 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 regarding Electric and Electromagnetic Fields in the safety section of the manual.
- Do not operate in areas with an ambient temperature greater than 104°F (40°C). **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 a flux hopper or an area where dust build-up is extreme.

Avoid placing the cooler near areas of extreme heat.

RECOMMENDED POWER SOURCE

The Cool Arc® 22 is designed for use with water-cooled torches. The Cool Arc® 22 must be used with a Lincoln Electric TIG welding power source that lists the Cool Arc 22 as an approved accessory.

INPUT SUPPLY CONNECTION

The Cool Arc® 22 must be powered directly from the welding power sources listed above.

To connect or disconnect the input supply to the Cool Arc® 22, turn off the welding power source and then connect or disconnect it from the cooler.

Caution must be observed because the input voltage to the cooler is 390Vdc.

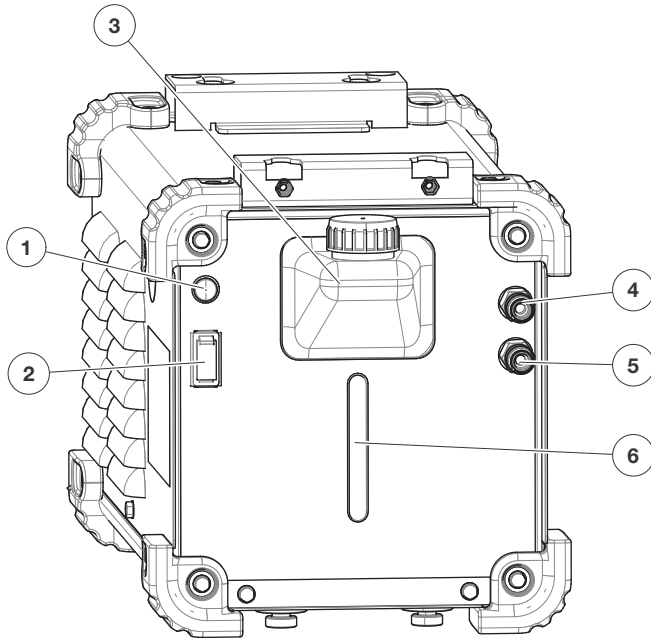
An internal electronic board adapts this voltage for the pump, fan and light.

WARNING

Welding power sources are equipped with protection, however, do not connect or disconnect a CA22 to or from a welding power source that is on. Always turn OFF the welding power source.

Do not apply power to the welding power source when the cooler reservoir is insufficiently filled and/or the torch's hoses are disconnected from the cooling unit. Failure to observe this warning may cause internal damage to the cooler.

CONTROLS AND OPERATIONAL FEATURES
FIGURE 2



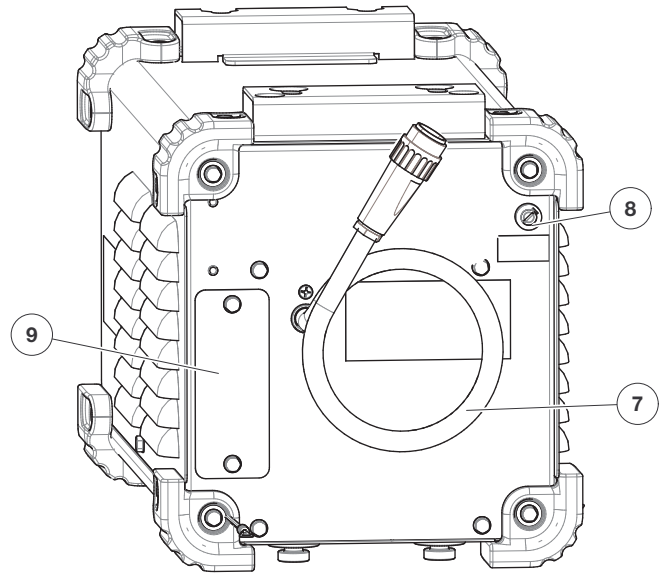
1. **Power Indicator Light:** This lamp will illuminate when the pump and internal fan are on. The light does not indicate the Cool Arc® 22 is being supplied by the power source.
2. **Flow Sensor Switch:** The Cool Arc® 22 comes equipped with a flow sensor that triggers an error code to the machine to 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 off '0' or on '1'. The default position is on when first powered on out of the box. When in '0' off position, the flow sensor is inactive: in this condition the missing coolant flow is not detected.

⚠ WARNING

A flow sensor is incorporated to detect low coolant flow. A low or no flow condition will disable the welding output to protect the torch.

3. **Reservoir for Coolant with Cap:** The translucent reservoir enables control of volume of the coolant. A tank filter to catch 400um dust material is located in opening tank. See Maintenance section for more details.
4. **Quick Connect Coupling Outlet:** Supplies cool coolant to the torch/gun.
5. **Quick Connect Coupling Inlet:** Takes warm coolant from torch/gun.
6. **Minimum and Maximum Liquid Level:** The minimum recommended liquid level is 0.4 gallons.

FIGURE 3



7. **Power Lead with 9-pin connector.** Table below indicates the Pin-out and description:

Pin #	Signal name	Description
1	COM	Reference
2	+15V/1	Aux power supply
3	Coolant Error	Coolant flow error
4	Presence	To indicate to Power generator CA22 is active
5	NC	Not used
6	VBUS	Power supply 390Vdc
7	NC	Not used
8	ON_OFF	To enable pump and cooling
9	EARTH	Earth ground

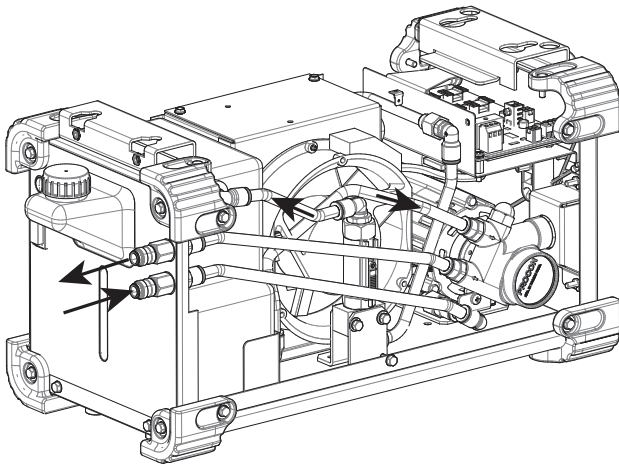
8. **Fuse Receptacle:** A 2A fuse is present to protect the motor pump.
9. **Removable Strainer.** The pump is equipped with a 150um strainer: an external cover is supplied to protect the accessible strainer. See Maintenance section for more details.

⚠ WARNING

Moving parts can injure. Never place fingers or tools into the louvers of the cooler.

CIRCULATION OF COOLANT IN THE COOLER

FIGURE 4



WARNING

Avoid kinking or putting sharp bends in any coolant lines.

Never operate the cooler with the case off.

COOLANT AND FILLING THE RESERVOIR

WARNING

Before filling the coolant reservoir, turn off the welder and disconnect the cooler's power lead from the welder.

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 Lincoln Electric 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 the heat exchanger, affecting cooling performance.

WARNING

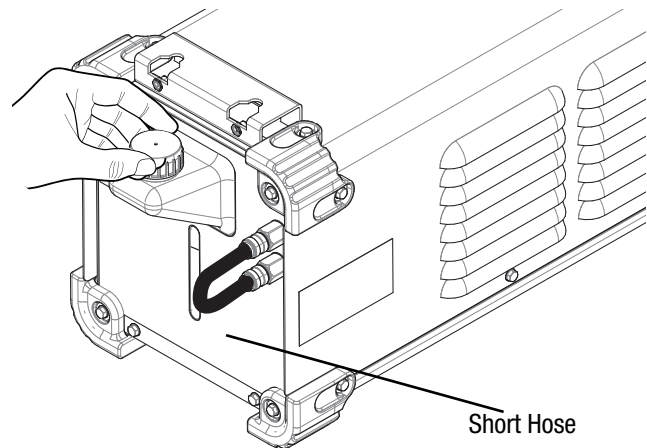
Never operate the cooler with the reservoir empty.

Do not start the cooler with less than 0.4 gallons 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 5



- 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 5).
- Fill the coolant reservoir.
- Remove the reservoir cap to prevent generating a partial vacuum.
- Place the flow sensor to the off '0' position.
- 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 hoses – Figure 6.
- Turn the power source on.
- Wait 30 seconds until the coolant fully circulates through the cooling system.
- Review the coolant level and add coolant if coolant level is below the minimum mark.
- Tighten the cap.
- Return the flow sensor to the on '1' position.

⚠ WARNING

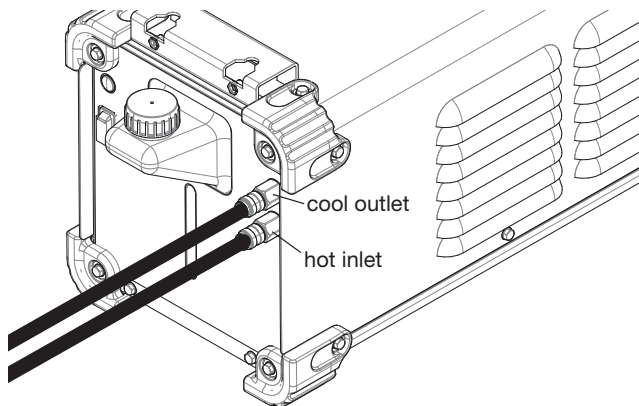
After priming the pump and/or bleeding the cooling system, be sure the reservoir's cap is tightened. Operating the cooler without the cap tightened can cause poor cooling efficiency, evaporation loss of coolant, and low product life.

- The welding set is ready to work.

CONNECTING THE COOLING SYSTEM HOSES

- Turn Power Source off.
- Connect the "inlet" hose of torch/gun (colored or tagged red on most hoses) to the inlet quick connect coupling [Item 4 fig.2] located on the front panel of the cooler.
- Connect the "outlet" hose of torch/gun (colored or tagged blue on most hoses) to the outlet quick connect coupling [Item 5 fig.2] located on the front panel of the cooler.

FIGURE 6



Warning: The water-cooler hoses are connected into the quick connect coupling type, which automatically close when hoses are disconnected.

Before installing the hoses to the cooler, verify that 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 lines.








Keep all lines clean and free of any blockage.

Keep the reservoir full especially after changing lines.

TRANSPORT

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

SYMBOLS USED

-  **Direct Current**
-  **Cooling Power**
-  **Power On**
-  **Flow Sensor ON**
-  **Flow Sensor OFF**
-  **Cooled Coolant Out**
-  **Warm Coolant In**

MAINTENANCE

Safety Precautions

WARNING

ELECTRIC SHOCK can kill.

- Do not touch electrically live parts or electrode with skin or wet clothing.
- Insulate yourself from work and ground
- Always wear dry insulating gloves.
- Disconnect input power by removing plug from receptacle before working inside Cooler.
- Do not touch electrically "hot" parts inside Cooler.
- Have qualified personnel do the installation, maintenance and troubleshooting work.
- Unplug the cooler before performing general maintenance.



MOVING PARTS can injure.

- Do not operate with doors open or guards off.
- Keep away from moving parts.



See additional warning information throughout this Operator's Manual

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 condition: replace it, if necessary.
- Check condition and operation of the cooling fan. Keep 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.
- Clean the tank filter.

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 ensure coolant is NOT HOT before servicing the cooler.

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.

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.



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

PUMP INLET STRAINER MAINTENANCE

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
- Damage to the pump head's inlet areas
- Torch damage from overheating due to insufficient coolant flow rate.

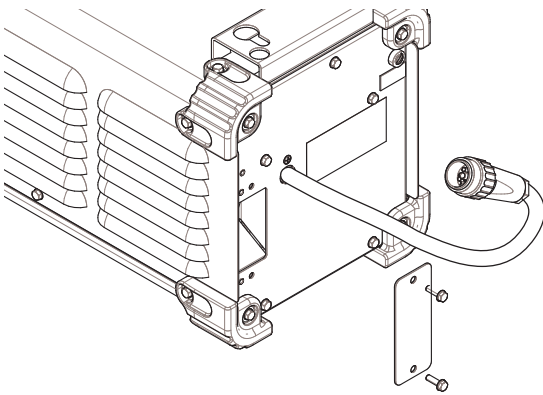
A new or properly cleaned pump inlet strainer should restore the cooler's performance.

It is recommended to clean or replace the pump's inlet strainer at least once a year.

ACCESS THE STRAINER

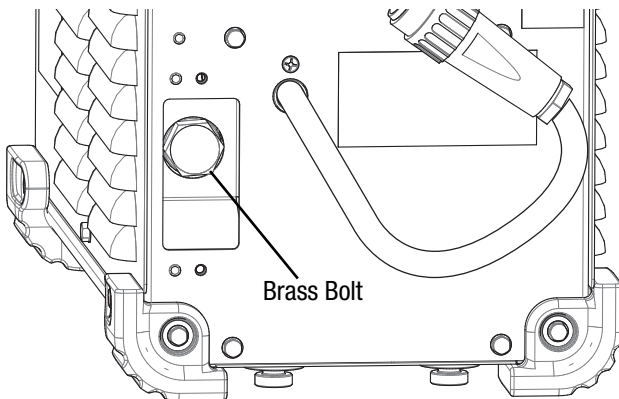
- **DISCONNECT WELDER AND COOLER FROM POWER**
- The strainer access panel is located on the back lower left, remove two screws - see Figure 7

FIGURE 7



- Next remove the large brass bolt (approx. 15/16-inch hex). See Figure 8. A deep well socket or tongue and groove pliers may be used. A small amount of coolant may leak.

FIGURE 8



- Strainer will be removed with bolt
- Clean strainer and reassemble

TROUBLESHOOTING

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.



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

WWW.LINCOLNELECTRIC.COM/LOCATOR

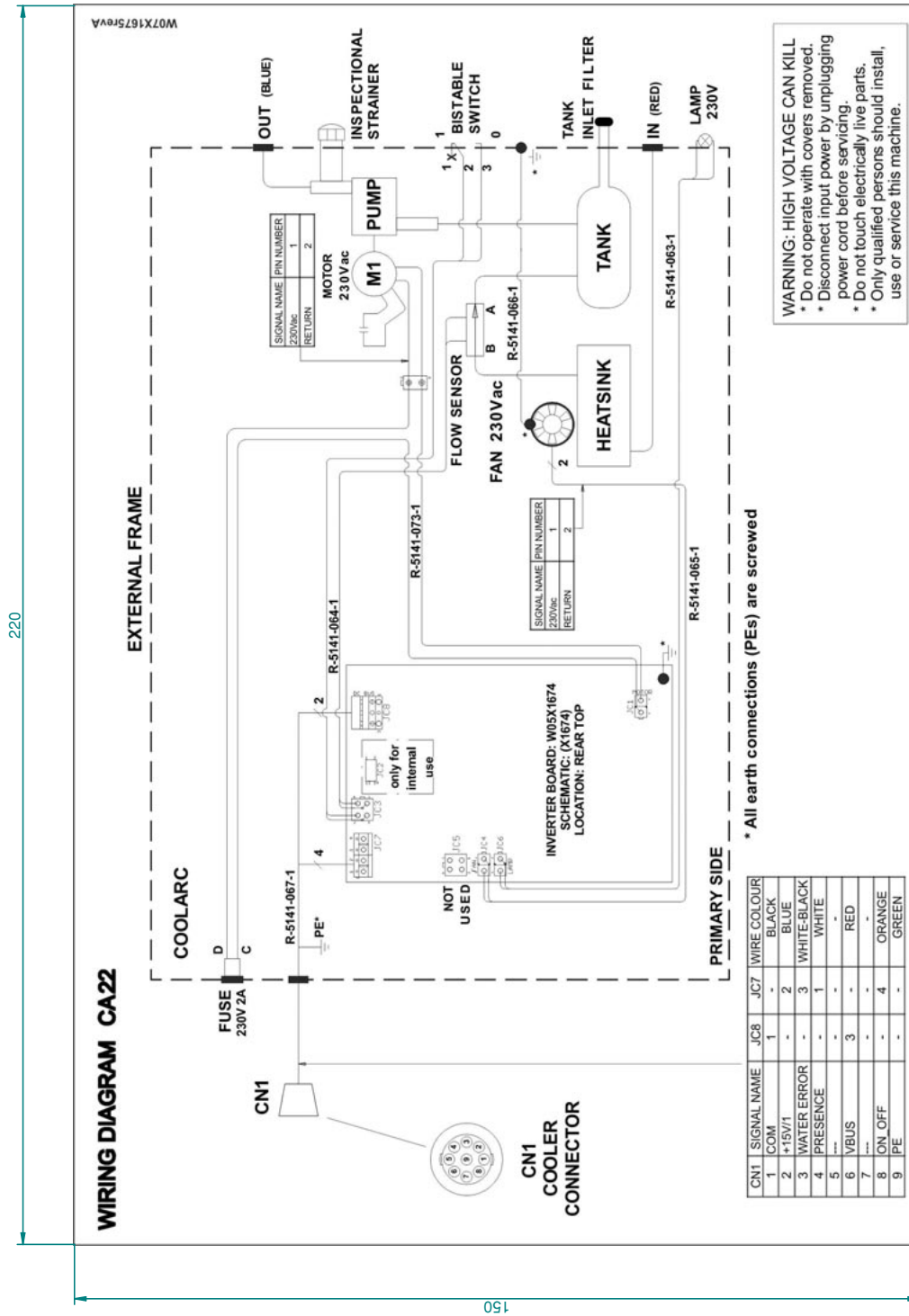
PROBLEM	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Cooler does not operate.	Power lead unplugged.	Plug in power lead.
	No power at outlet.	Check power supply output.
	Power lead is damaged.	Repair damaged lead or order new lead set.
	Water lines blocked or crimped.	Clear blockage in hose. Avoid kinking or putting sharp bends in water lines.
	Leak in gun or water hoses.	Repair leak.
	Reservoir empty.	Fill reservoir.
Internal water leak.	Internal quick connector loose.	Insert tube correctly in quick connector clamp.
	Internal hose punctured.	Replace punctured hose with new hose.
	Heat exchanger leaking.	Replace heat exchanger.
Leak at inlet/outlet connector block.	Hose clamp loose.	Tighten hose clamp onto hose.
Torch or gun runs hot.	Fan not operating.	Reference fan section.
Fan operates but there is low coolant flow.	Leak in torch/gun or hoses.	Repair leak.
	Torch/gun or hoses partially obstructed.	Clear obstruction.
	Reservoir empty or very low.	Refill reservoir.
Fan operates but there is no coolant flow.	Pump failure.	Replace pump.
	Pump seized.	Replace pump.
	2A Fuse opened	Replace 2A fuse
Pump operates, but fan does not.	Fan motor failure.	Replace fan.
Weld output disabled	Low or no coolant flow.	Fill reservoir.
	Faulty flow sensor.	Replace flow sensor.



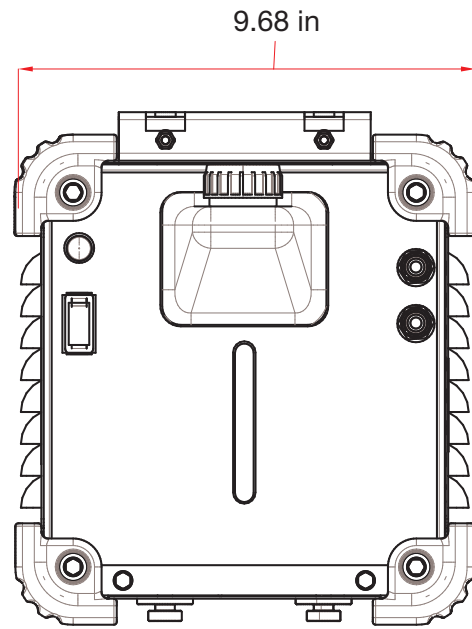
If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Lincoln Authorized Service Facility for technical troubleshooting assistance before you proceed.

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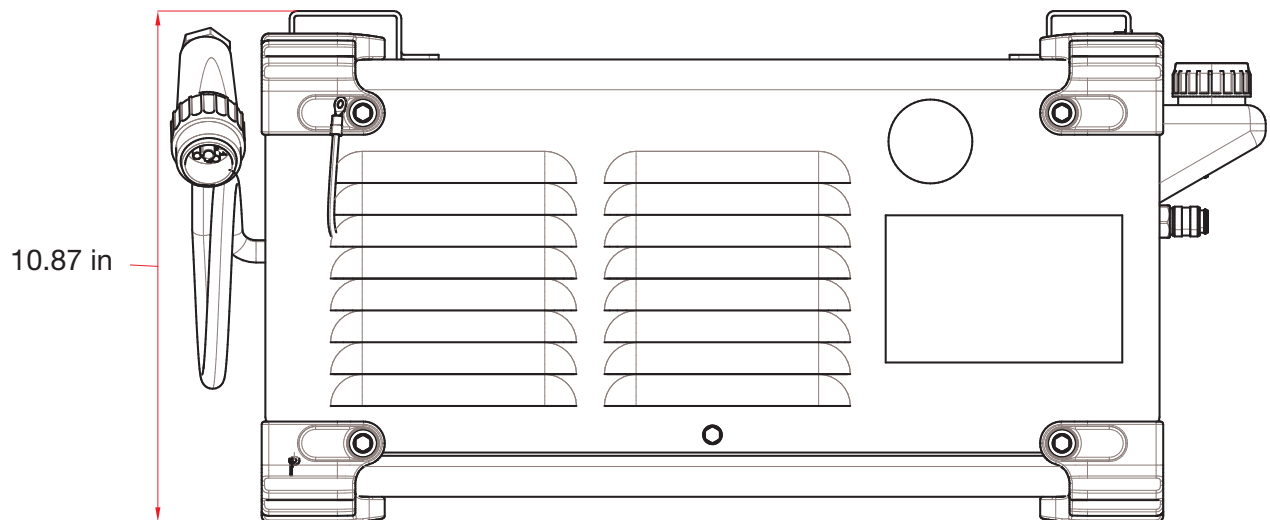
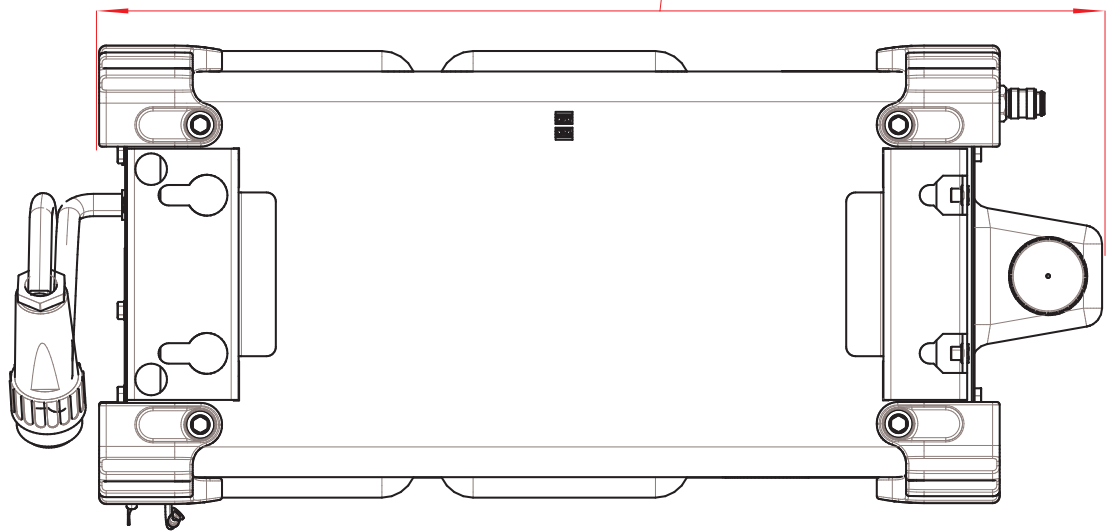
Wiring Diagram (12733)



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.



21.26



			
WARNING	<ul style="list-style-type: none"> Do not touch electrically live parts or electrode with skin or wet clothing. Insulate yourself from work and ground. 	<ul style="list-style-type: none"> Keep flammable materials away. 	<ul style="list-style-type: none"> Wear eye, ear and body protection.
Spanish AVISO DE PRECAUCION	<ul style="list-style-type: none"> No toque las partes o los electrodos bajo carga con la piel o ropa mojada. Aíslese del trabajo y de la tierra. 	<ul style="list-style-type: none"> Mantenga el material combustible fuera del área de trabajo. 	<ul style="list-style-type: none"> Protéjase los ojos, los oídos y el cuerpo.
French ATTENTION	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Gardez à l'écart de tout matériel inflammable. 	<ul style="list-style-type: none"> Protégez vos yeux, vos oreilles et votre corps.
German WARNUNG	<ul style="list-style-type: none"> Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! Isolieren Sie sich von den Elektroden und dem Erdboden! 	<ul style="list-style-type: none"> Entfernen Sie brennbares Material! 	<ul style="list-style-type: none"> Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese ATENÇÃO	<ul style="list-style-type: none"> Não toque partes elétricas e electrodos com a pele ou roupa molhada. Isole-se da peça e terra. 	<ul style="list-style-type: none"> Mantenha inflamáveis bem guardados. 	<ul style="list-style-type: none"> Use proteção para a vista, ouvido e corpo.
Japanese 注意事項	<ul style="list-style-type: none"> 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。 	<ul style="list-style-type: none"> 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。 	<ul style="list-style-type: none"> 目、耳及び身体に保護具をして下さい。
Chinese 警告	<ul style="list-style-type: none"> 皮肤或湿衣物切勿接触带电部件及焊条。 使你自已与地面和工件绝缘。 	<ul style="list-style-type: none"> 把一切易燃物品移离工作场所。 	<ul style="list-style-type: none"> 佩戴眼、耳及身体劳动保护用具。
Korean 위험	<ul style="list-style-type: none"> 전도체나 용접봉을 젖은 헝겍 또는 피부로 절대 접촉치 마십시오. 모재와 접지를 접촉치 마십시오. 	<ul style="list-style-type: none"> 인화성 물질을 접근시키지 마십시오. 	<ul style="list-style-type: none"> 눈, 귀와 몸에 보호장구를 착용하십시오.
Arabic تحذير	<ul style="list-style-type: none"> لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجسدك أو بالملابس المبللة بالماء. ضع عازلا على جسمك خلال العمل. 	<ul style="list-style-type: none"> ضع المواد القابلة للاشتعال في مكان بعيد. 	<ul style="list-style-type: none"> 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.

			
<ul style="list-style-type: none"> ● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone. 	<ul style="list-style-type: none"> ● Turn power off before servicing. 	<ul style="list-style-type: none"> ● Do not operate with panel open or guards off. 	WARNING
<ul style="list-style-type: none"> ● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases. 	<ul style="list-style-type: none"> ● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio. 	<ul style="list-style-type: none"> ● No operar con panel abierto o guardas quitadas. 	Spanish AVISO DE PRECAUCION
<ul style="list-style-type: none"> ● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail. 	<ul style="list-style-type: none"> ● Débranchez le courant avant l'entretien. 	<ul style="list-style-type: none"> ● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés. 	French ATTENTION
<ul style="list-style-type: none"> ● Vermeiden Sie das Einatmen von Schweißrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes! 	<ul style="list-style-type: none"> ● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!) 	<ul style="list-style-type: none"> ● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen! 	German WARNUNG
<ul style="list-style-type: none"> ● Mantenha seu rosto da fumaça. ● Use ventilação e exaustão para remover fumo da zona respiratória. 	<ul style="list-style-type: none"> ● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas. 	<ul style="list-style-type: none"> ● Mantenha-se afastado das partes moventes. ● Não opere com os painéis abertos ou guardas removidas. 	Portuguese ATENÇÃO
<ul style="list-style-type: none"> ● 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。 	<ul style="list-style-type: none"> ● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切して下さい。 	<ul style="list-style-type: none"> ● パネルやカバーを取り外したまま機械操作をしないで下さい。 	Japanese 注意事項
<ul style="list-style-type: none"> ● 頭部遠離煙霧。 ● 在呼吸區使用通風或排風器除煙。 	<ul style="list-style-type: none"> ● 維修前切斷電源。 	<ul style="list-style-type: none"> ● 儀表板打開或沒有安全罩時不準作業。 	Chinese 警告
<ul style="list-style-type: none"> ● 얼굴로부터 용접가스를 멀리하십시오. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오. 	<ul style="list-style-type: none"> ● 보수전에 전원을 차단하십시오. 	<ul style="list-style-type: none"> ● 판넬이 열린 상태로 작동치 마십시오. 	Korean 위험
<ul style="list-style-type: none"> ● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها. 	<ul style="list-style-type: none"> ● أقطع التيار الكهربائي قبل القيام بأية صيانة. 	<ul style="list-style-type: none"> ● لا تشغيل 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說明以及應該使用的銀焊材料，並請遵守貴方的有關勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

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

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.

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

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