

# COOL ARC® 27

## OPERATOR'S MANUAL



ENGLISH

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

- Please Examine Package and Equipment in case of 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:	
.....	.....

## INDEX

Technical Specifications.....	1
Electromagnetic Compatibility (EMC).....	2
Safety .....	3
Introduction .....	5
Unpacking .....	5
Installation on Power Source.....	5
Installation on Cart 24 .....	6
Installation and Operator Instructions.....	7
WEEE .....	12
Spare Parts .....	12
Authorized Service Shops Location .....	12
Electrical Schematic .....	12
Accessories.....	13

# Technical Specifications

NAME		INDEX		
COOL ARC® 27		K14334-1		
INPUT				
	Input Voltage U <sub>1</sub>	Input Amperes I <sub>1max</sub>		
COOL ARC® 27	580Vdc	0.15A		
	Frequency	EMC Class		
COOL ARC® 27	DC voltage	A		
PARAMETERS RATING				
	The cooling power of flow 1liter per minute at temperature of 25°C	Maximum pressure rate		
COOL ARC® 27	0,84 kW	0,7 MPa		
PARAMETERS OF THE COOLER'S RESERVOIR				
	Maximum reservoir capacity	Minimum required reservoir capacity		
COOL ARC® 27	3.3L	1.0L		
COOLANT				
COOL ARC® 27	Recommended coolant	FREEZCOOL - W000010167		
COOL ARC® 27	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® 27	8 kg (without liquid)	160 mm	230 mm	498mm
	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)

# 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.

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.





## WARNING

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

	<p><b>WARNING:</b> This symbol indicates that instructions must be followed to avoid serious personal injury, loss of life, or damage to this equipment. Protect yourself and others from possible serious injury or death.</p>
	<p><b>READ AND UNDERSTAND INSTRUCTIONS:</b> Read and understand this manual before operating this equipment. Arc welding can be hazardous. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment.</p>
	<p><b>ELECTRIC SHOCK CAN KILL:</b> Welding equipment generates high voltages. Do not touch the electrode, work clamp, or connected work pieces when this equipment is on. Insulate yourself from the electrode, work clamp, and connected work pieces.</p>
	<p><b>ELECTRICALLY POWERED EQUIPMENT:</b> Turn off input power using the disconnect switch at the fuse box before working on this equipment. Ground this equipment in accordance with local electrical regulations.</p>
	<p><b>ELECTRICALLY POWERED EQUIPMENT:</b> Regularly inspect the input, electrode, and work clamp cables. If any insulation damage exists replace the cable immediately. Do not place the electrode holder directly on the welding table or any other surface in contact with the work clamp to avoid the risk of accidental arc ignition.</p>
	<p><b>ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS:</b> Electric current flowing through any conductor creates electric and magnetic fields (EMF). EMF fields may interfere with some pacemakers, and welders having a pacemaker shall consult their physician before operating this equipment.</p>
	<p><b>CE COMPLIANCE:</b> This equipment complies with the European Community Directives.</p>
 <p>Optical radiation emission Category 2 (EN 12191)</p>	<p><b>ARTIFICIAL OPTICAL RADIATION:</b> According with the requirements in 2006/25/EC Directive and EN 12198 Standard, the equipment is a category 2. It makes mandatory the adoption of Personal Protective Equipments (PPE) having filter with a protection degree up to a maximum of 15, as required by EN169 Standard.</p>
	<p><b>FUMES AND GASES CAN BE DANGEROUS:</b> Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. To avoid these dangers the operator must use enough ventilation or exhaust to keep fumes and gases away from the breathing zone.</p>
	<p><b>ARC RAYS CAN BURN:</b> Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing. Use suitable clothing made from durable flame-resistant material to protect you skin and that of your helpers. Protect other nearby personnel with suitable, non-flammable screening and warn them not to watch the arc nor expose themselves to the arc.</p>

	<p><b>WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION:</b> Remove fire hazards from the welding area and have a fire extinguisher readily available. Welding sparks and hot materials from the welding process can easily go through small cracks and openings to adjacent areas. Do not weld on any tanks, drums, containers, or material until the proper steps have been taken to insure that no flammable or toxic vapors will be present. Never operate this equipment when flammable gases, vapors or liquid combustibles are present.</p>
	<p><b>WELDED MATERIALS CAN BURN:</b> Welding generates a large amount of heat. Hot surfaces and materials in work area can cause serious burns. Use gloves and pliers when touching or moving materials in the work area.</p>
	<p><b>CYLINDER MAY EXPLODE IF DAMAGED:</b> Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. Always keep cylinders in an upright position securely chained to a fixed support. Do not move or transport gas cylinders with the protection cap removed. Do not allow the electrode, electrode holder, work clamp or any other electrically live part to touch a gas cylinder. Gas cylinders must be located away from areas where they may be subjected to physical damage or the welding process including sparks and heat sources.</p>
	<p><b>HOT COOLANT CAN BURN SKIN:</b> Always be sure coolant is NOT HOT before servicing the cooler.</p>
	<p><b>HIGH PRESSURE EQUIPEMENT.</b> Turn off input power before connecting or disconnecting cooling circuit.</p>
	<p><b>SAFETY MARK:</b> This equipment is suitable for supplying power for welding operations carried out in an environment with increased hazard of electric shock.</p>

The manufacturer reserves the Right to make changes and/or improvements in design without upgrade at the same time the operator's manual.

# Introduction

**COOL ARC® 27** cooler is a stand alone recirculating cooling system designed to use with MIG welding power sources that lists the **COOL ARC® 27** as an approved accessory.

The following equipment is included with the **COOL ARC® 27**:

- 2 adaptor metal sheets to ensure connection between Power Source and Cooler.
- M5x20 screw for fixing to the power source and cooler

The **COOL ARC® 27** is delivered empty with no coolant in the system. FREEZCOOL - W000010167 is recommended.

# Unpacking

## Unpacking the COOL ARC® 27

The packaging of the Cooler is designed to withstand shipping abuse, and contains a cardboard liner that surrounds the unit. If any shipping damages have been 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 manual instruction and service directory supplied with the **COOL ARC® 27** for parts orders and future maintenance service.

# Installation on Power Source

The **COOL ARC® 27** need to be mounted directly under the welding power source that lists the **COOL ARC® 27** as an approved accessory.

### WARNING

Only a qualified electrician can connect the welding machine to the supply. Installation had to be made in accordance with the appropriate National Electrical Code and local regulations.

### WARNING

Before connecting **COOL ARC® 27** turn off the power source and disconnect it from the input supply.

### INSTALLATION:

1. Place the adaptor metal sheets under the power source (Figure 1).
2. Remove the screw of hatch and turn it at 180°C. Use the removed screw to fix the hatch on Power Source (Figure 1).
3. Place the power source on the cooler and slightly tilt it to connect the cooler plug to the power source (Figure 2).
4. Finally, screw the adaptor metal sheets to the cooler (Figure 3).

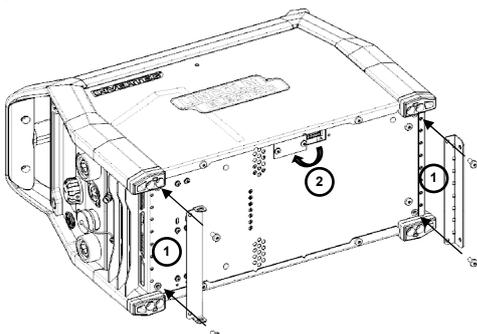


Figure 1

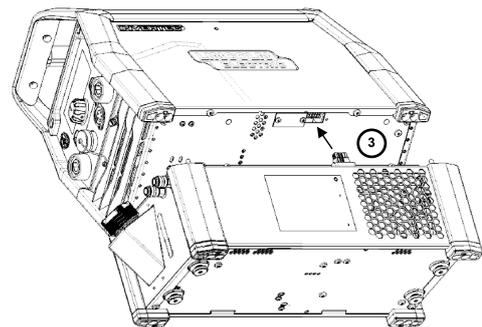


Figure 2

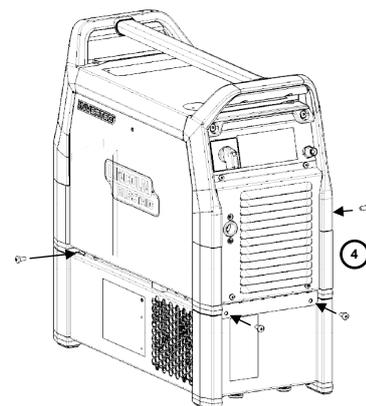


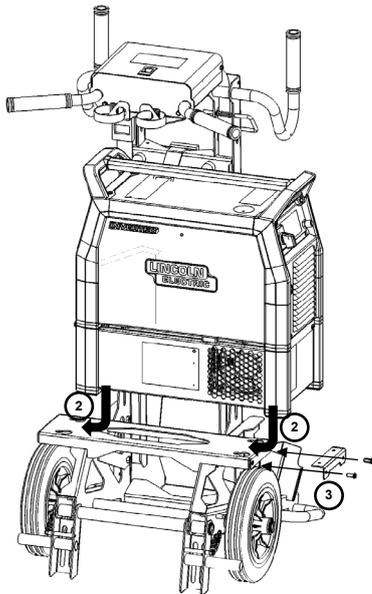
Figure 3

## Installation on Cart 24

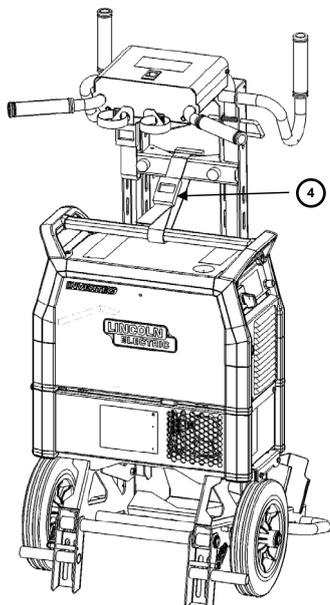
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The **COOL ARC® 27** can be mounted on Cart 24 (K14191-1).

1. Install the Power source on the Cooler.
2. Slide the Power Source+Cooler into the holes on plate (Figure 4).
3. Screw the blocking metal to avoid movement of full equipment (Figure 4)..
4. Use the belt around the Handle and Cart to finalize installation. (Figure 5)



**Figure 4**



**Figure 5**

# Installation and Operator Instructions

Read this entire section before installation or operation of 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.



## LOCATION

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 when possible 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 higher than 40°C. 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.

## RECOMMENDED POWER SOURCE

The **COOL ARC® 27** is designed for use with water-cooled torches. The **COOL ARC® 27** must be used with a TIG welding power source that lists the **COOL ARC® 27** as an approved accessory.

## Input Supply Connection

The **COOL ARC® 27** must be supplied by a welding power source in accordance with installation procedure that can be done only by qualified electrician. Installation must be made in accordance with the appropriate National Electrical Code and local regulations.

## WARNING

Do not run cooler 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

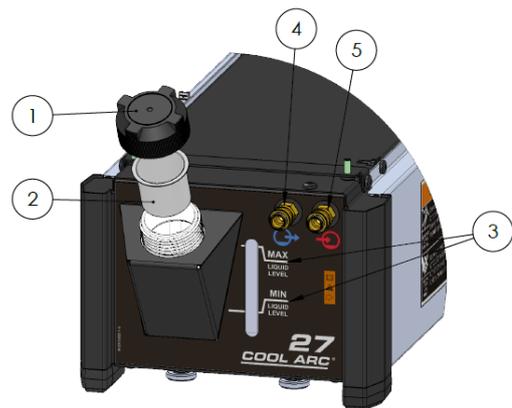


Figure 6

The **COOL ARC® 27** comes equipped with a flow sensor that triggers an error code to the machine to protect the Torch from over-heating when inadequate coolant flow is detected through the flow sensor. The Error Code fault (Error 266) can indicate a possible kink in the torch lines, damage and/or a leak in the Torch coolant lines.

## 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.

1. Reservoir for Coolant with Cap: The translucent reservoir enables control of the coolant level.
2. Reservoir filter: 400µm.
3. Minimum and maximum Liquid Level: The minimum recommended liquid level is 3 liters.
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. Airflow Slots: Enable proper circulation of air cooling

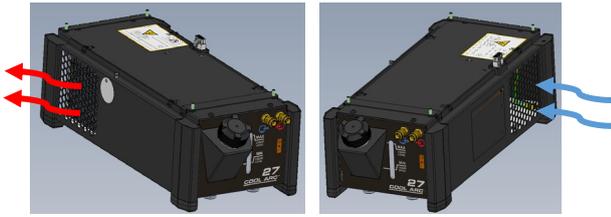


Figure 7

### Circulation of Coolant in the Cooler

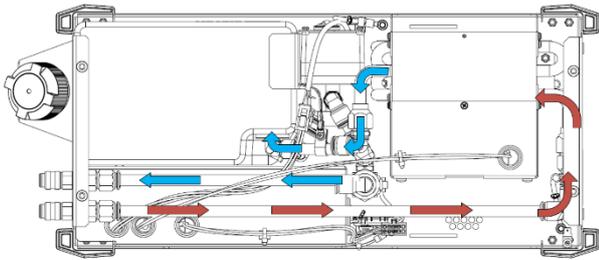


Figure 8

**! WARNING**

Avoid kinking or putting sharp bends in any water lines.

**! WARNING**

Never operate the cooler with case off.

### Modes of operation

COOL ARC® 27 can be set in modes:

Status	Description
Auto	The cooler switches on after starting of the welding and turns off after the time that is required to cool down the torch after welding
OFF	Cooler is turned off
ON	Cooler is permanently on

This Menu is accessible in System Option section in Cooler Management section.



Figure 9

### Filling the reservoir and water lines

**! WARNING**



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

The cooler should be filled and used only in the horizontal position.

Use only recommended coolant FREEZCOOL - W000010167

**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**

Never operate the cooler with the reservoir empty.

**! WARNING**

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

- Assemble the welding setup (see Installation on Power Source chapter)
- Remove the reservoir cap to prevent generating a partial vacuum.
- Fill the coolant reservoir to the maximum level - 3 liters.
- Plug the torch hoses to the cooler.
- Turn the power source on.
- Activate the cooler from the power source menu (Figure 10)
- Wait until the coolant fully circulates through the cooling system and returns into the reservoir –
- Deactivate the cooler in same way it has been activated in Cooler Management menu.
- Check the coolant level and add if required fill in coolant to reach level between minimum and maximum, which is present on front label **COOL ARC® 27**
- Tighten the cap.

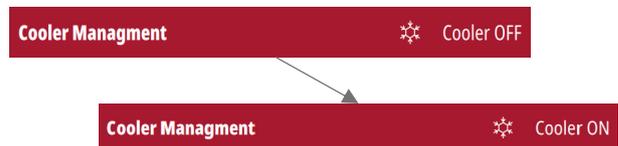


Figure 10

## Error Message - lack coolant flow

If coolant flow is not detected by system during welding or when power Source is switched ON, an image will be shown on the screen as Figure 11, machine will protect itself by automatically stop welding output.

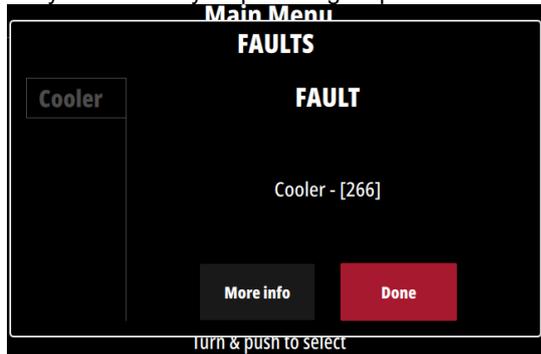


Figure 11

Press the left button / knob to delete error message. If **COOL ARC® 27** is in **ON** mode machine reset is required to continue welding. This behavior is to protect the pump from damage and the torch from overheating.

### WARNING

If during next welding attempts machine still display error 266 please contact with the Technical Service Center or Lincoln Electric.

## Transport

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

## 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.

## 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.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to [www.lincolnelectric.com](http://www.lincolnelectric.com) for any updated information.

## 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.

LOCATE PROBLEM (SYMPTOM).	POSSIBLE CAUSE	RECOMMENDED COURSE OF 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> <li>Blown fuse.</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> <li>Replace fuse.</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 in the power source</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>

## WEEE

07/06



Do not dispose of electrical equipment together with normal waste!

In observance of European Directive 2012/19/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 "X" 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, that contains a picture-descriptive part number cross-reference.

## Authorized Service Shops Location

01/19

- The purchaser must contact Lincoln Electric or Authorized Service Facility about any defect claimed under warranty period.
- Contact your local Sales Representative for assistance in locating the nearest Authorized Service Facility.

## Electrical Schematic

Refer to the "Spare Part" manual supplied with the machine.

## Accessories

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W000010167	FREEZCOOL cooling liquid for torches 9.6L
K14191-1	CART 24