

COOLARC 46

OPERATOR'S MANUAL



ENGLISH

LINCOLN[®]
ELECTRIC

THE WELDING EXPERTS[®]

Lincoln Electric Bester Sp. z o.o.
ul. Jana III Sobieskiego 19A, 58-263 Bielawa, Poland
www.lincolnelectric.eu

Declaration of conformity



Lincoln Electric Bester Sp. z o.o.

Declares that the welding machine:

K14105-1 COOLARC 46

conforms to the following directives:

2006/95/CEE, 2004/108/CEE

and has been designed in compliance with the
following standards:

EN 60974-2, EN 60974-10:2007



27.04.2012

Paweł Lipiński
Operations Director

Lincoln Electric Bester Sp. z o.o., ul. Jana III Sobieskiego 19A, 58-263 Bielawa, Poland

12/05

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

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

Model Name:
Code & Serial Number:
Date & Where Purchased

ENGLISH INDEX

Safety	1
Introduction	2
Installation and Operator Instructions	2
Electromagnetic Compatibility (EMC)	7
Technical Specifications	8
WEEE	9
Spare Parts	9
Electrical Schematic	9
Accessories	9



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.

	WARNING: 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.
	READ AND UNDERSTAND INSTRUCTIONS: 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.
	ELECTRIC SHOCK CAN KILL: 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.
	ELECTRICALLY POWERED EQUIPMENT: 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.
	ELECTRICALLY POWERED EQUIPMENT: 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.
	ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS: 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.
	CE COMPLIANCE: This equipment complies with the European Community Directives.
	ARTIFICIAL OPTICAL RADIATION: 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 Equipment (PPE) having filter with a protection degree up to a maximum of 15, as required by EN169 Standard.
	FUMES AND GASES CAN BE DANGEROUS: 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.
	ARC RAYS CAN BURN: 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.

	WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION: 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.
	WELDED MATERIALS CAN BURN: 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.
	CYLINDER MAY EXPLODE IF DAMAGED: 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.
	SAFETY MARK: This equipment is suitable for supplying power for welding operations carried out in an environment with increased hazard of electric shock.

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

Introduction

The **COOLARC 46** is a cooling system designed for use with water-cooler torches and guns:

- GTAW torches
- MGAW guns up to 500A.

The following equipment has been added to **COOLARC 46**:

- Hose with quick water connector – 0,2m.

COOLARC 46 is delivered empty with no coolant in the system.

Recommended equipment, which can be bought by user, was mentioned in the chapter "Accessories".

Installation and Operator Instructions

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

Location and Environment

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 greater than 40°C.

Input Supply Connection

The **COOLARC 46** could be supplied by welding power source using 9-PIN socket.

To connect the input supply to the **COOLARC 46**, turn off the power to the welding power source and disconnect it from the input supply.

The allowable input voltages are 230V/400V, 50/60Hz. 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 applied if the reservoir was not filled and the torch's/gun's hoses are disconnected from the cooling unit. The non-observance of this warning may cause internal damages at the cooler unit.

Controls and Operational Features

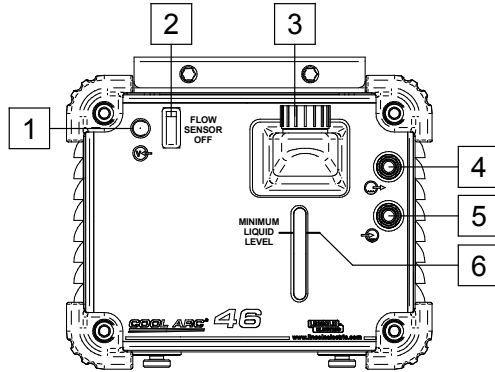


Figure 1.



1. **Power Indicator Light:** This lamp will light up to indicate that the cooler is supplied by the power source.

2. **Flow Sensor off Switch:** Turn the coolant flow sensor off. This switch can be used only when the pump has to be primed and the cooler has to be bled (see "First use of the cooler and bleeding cooling system").



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 Nut:** The translucent reservoir enables control of value 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 Liquid Level:** Determine the level of coolant in which the cooler can work.

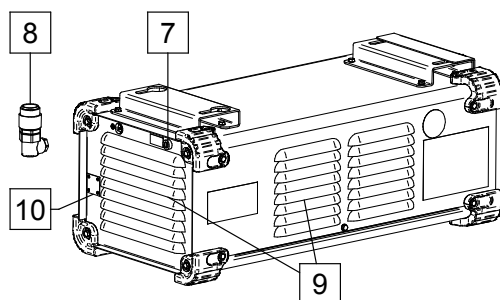


Figure 2.

7. **Fuse:** Use the 2A slow-blow fuse (see "Spare Parts" section).
8. **Power Lead with 9-PIN Socket.**
9. **Airflow Slots:** Enable proper circulation of air cooling (Figure.3).
10. **Hole Plug.**

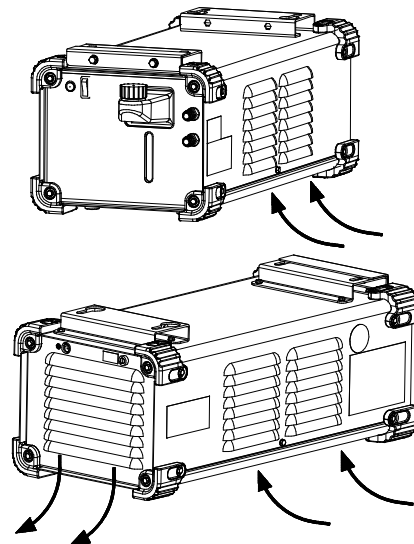


Figure 3.



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

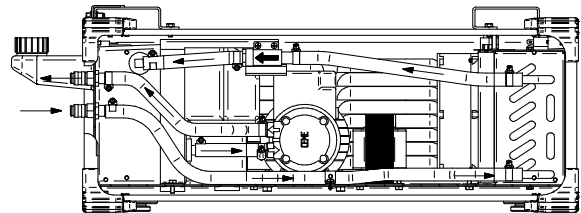


Figure 4.

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.

Preparation COOLARC 46 to Work

- Fill the coolant reservoir.
- Connect **COOLARC 46** to power source.
- Turn the power source on.
- **Warning:** First use the cooler require the pump is primed by coolant.
- Turn power source off.
- Connect the water-cooler hoses to the cooler's inlet [5] and outlet [4] socket (Figure 6).
- Turn the power source on.
- **Warning:** The water-cooler hoses can require bleeding.

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.

Acorox is recommended coolant for **COOLARC 46** (see "Accessories" chapter).

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 maximum 6l coolant. Minimum 4l of coolant has to be poured into the reservoir.

WARNING

Never operate the cooler with the reservoir empty.

WARNING

Do not start cooler with coolant less than 4l. Too less volume of coolant can not be enough to full priming of the system and may damage the pump.

Priming Pump (only first use the cooler) and Bleeding the Cooling System

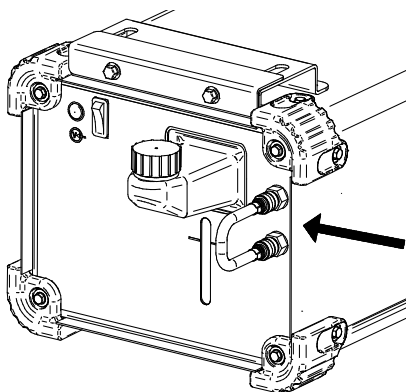


Figure 5.

- Assemble the welding set.
- Connect the hose with quick water connector (added to the equipment) to the cooler's inlet and outlet socket (Figure 5).
- Fill the coolant reservoir – minimum 4l.
- Undo the nut.

WARNING

At first using of the **COOLARC 46** reservoir's nut has to be removed to avoid generate partial vacuum in cooling system during priming pump.

- Turn the power source on.
- Force circulation of coolant: simultaneously press and hold the flow sensor off switch [2] and torch's/gun's trigger until the coolant does not circulate the cooling system and does not return the reservoir.
- Turn the power source off.
- Disconnect the hose with quick water connector.
- Connect the water-cooler hoses – Figure 6.
- Turn the power source on.
- Force circulation of coolant: simultaneously press and hold the flow sensor off switch [2] and torch's/gun's trigger until the coolant does not circulate the cooling system and does not return the reservoir.
- Tighten the nut.

WARNING

After priming pump and/or bleeding the cooling system, be sure the reservoir's nut is tightened up. Operation of the cooler without the nut is 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 "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.
 - 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.

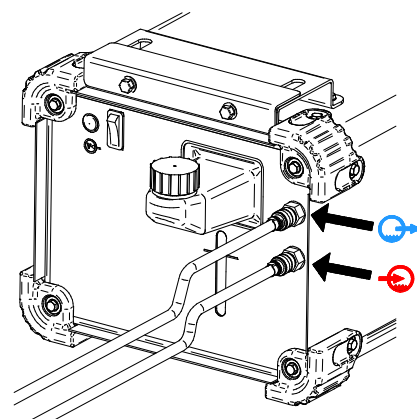


Figure 6.

Warning: The water-cooler hoses are connected into the quick connect coupling type 21KATS09MPX (see "Spare parts" chapter), which are equipped with automatic outflow blockade. Before water-cooler hoses installing to the cooler, you should check if the water-cooler hoses connectors match to the quick connect coupling 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.

Transport

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

Maintenance**WARNING**

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

Any noticeable damage should be reported immediately and repaired.

Routine maintenance (everyday)

- Check condition of water-cooler hoses, connections of the power lead.
- Check the welding torch / gun condition: replace it, if necessary.
- Check condition and operation of the cooling fan. Keep clean its airflow slots.
- 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 cabinet 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, 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 had to be turned off and the power lead had 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.

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.

Cooler does not operate.	- Power lead unplugged. - No power at outlet. - Power lead is damaged. - Water lines blocked or crimped. - Leak in gun or water hoses. - Reservoir empty.	- Plug in power lead. - Check outlet circuit breaker. - Repair damaged lead or order new lead set. - Clear blockage in hose. Avoid kinking or putting sharp bends in water lines. - Repair leak. - Fill reservoir.
Internal water leak.	- Hose clamp loose on one of internal hoses. - Internal hose punctured. - Heat exchanger leaking.	- Tighten or replace hose clamp. - Replace punctured hose with new hose. - Replace heat exchanger.
Leak at inlet/outlet connector block.	Hose clamp loose.	Tighten hose clamp onto hose.
Torch or gun runs hot.	- Unit placed by area of extreme heat. - Low coolant flow. - No coolant flow. - Fan not operating.	- Move unit away from hot air. - See Low Coolant Flow Section. - See No Coolant Flow Section. - Reference fan section.
Fan operates but there is low coolant flow.	- Leak in torch/gun or hoses. - Torch/gun or hoses partially obstructed. - Reservoir empty or very low.	- Repair leak. - Clear obstruction. - Refill reservoir.
Fan operates but there is no coolant flow.	- Pump failure. - Pump seized.	- Replace pump. - Replace pump.
Pump operates, but fan does not.	- Fan blade contacting heat exchanger. - Fan motor failure.	- Replace fan. - Replace fan.
Cooler trips outlet circuit breaker.	- Circuit overloaded. - Cooler electrical component failure.	- Check outlet circuit breaker. - Replace suppressor assembly and rectifier inside of cooler.

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		
COOLARC 46		K14105-1		
INPUT				
	Input Voltage U ₁	Input Amperes I _{1max}		
COOLARC 46	230 V ± 10%	0,65 A		
	400 V ± 10%			
	Frequency	EMC Group / Class		
COOLARC 46	50/60 Hz	II / A		
PARAMETERS RATING				
	The cooling power of flow 1liter per minute at temperature of 25°C	Maximum pressure rate		
COOLARC 46	1 kW	0,4 MPa		
PARAMETERS OF THE COOLER'S RESERVOIR				
	Maximum reservoir capacity	Minimum required reservoir capacity		
COOLARC 46	6 l	4 l		
COOLANT				
COOLARC 46	Recommended coolant	Acorox		
COOLARC 46	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
COOLARC 46	22,7 kg	255 mm	300 mm	700 mm
Protection Rating		Operating Humidity (t=20°C)	Operating Temperature	Storage Temperature
IP23		≤ 90 %	from -10 °C to +40 °C	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

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

Accessories

	K10420-1	Coolant Acorox (2x5l)
---	----------	-----------------------