IM3027
02/2011
Rev. 1

IDEALARC CV 420 & CV 505

OPERATOR'S MANUAL

MANUALE OPERATIVO

BEDIENUNGSANLEITUNG

MANUAL DE INSTRUCCIONES

MANUEL D'UTILISATION

BRUKSANVISNING OG DELELISTE

GEBRUIKSAANWIJZING

BRUKSANVISNING

INSTRUKCJA OBSŁUGI

KÄYTTÖOHJE

MANUAL DE INSTRUÇÕES

Lincoln Electric Bester Sp. z o.o.
ul. Jana III Sobieskiego 19A, 58-260 Bielawa, Poland
www.lincolnelectric.eu

Declaration of conformity

Lincoln Electric Bester Sp. z o.o.

CE

Declares that the welding machine:

IDEALARC CV 420
IDEALARC CV 505

conforms to the following directives:

2006/95/CEE, 2004/108/CEE

and has been designed in compliance with the following standards:

EN 60974-1, EN 60974-10

(2005)

Paweł Lipiński
Operations Director
Lincoln Electric Bester Sp. z o.o., ul. Jana III Sobieskiego 19A, 58-260 Bielawa, Poland

12/05

12/05

THANKS! For having choosen 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

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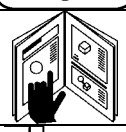
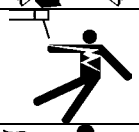
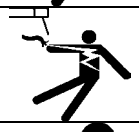
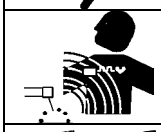
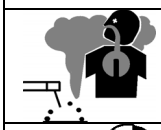
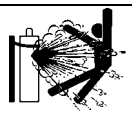
WARNING

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.
	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.
	SAFETY MARK: This equipment is suitable for supplying power for welding operations carried out in an environment with increased hazard of electric shock.

	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.

Installation and Operator Instructions

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

Location and Environment

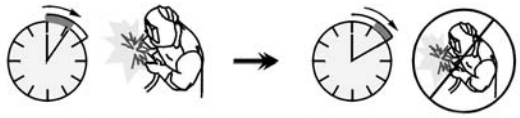
This machine will operate in harsh environments. However, it is important that simple preventative measures are followed to assure long life and reliable operation:

- 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.

Duty cycle and Overheating

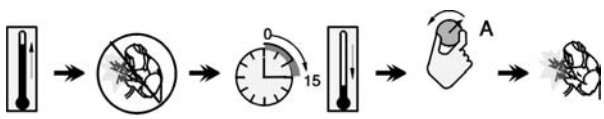
The duty cycle of a welding machine is the percentage of time in a 10 minute cycle at which the welder can operate the machine at rated welding current.

Example: 60% duty cycle:



Welding for 6 minutes. Break for 4 minutes.

Excessive extension of the duty cycle will cause the thermal protection circuit to activate.



Minutes or decrease duty cycle

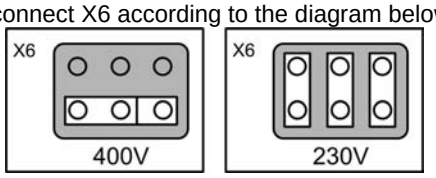
Input Supply Connection

Installation and mains outlet socket shall be made and protected according to appropriate rules.

Check the input voltage, phase, and frequency supplied to this machine before turning it on. Verify the connection of grounding wires from the machine to the input source. The allowable input voltages are 3x230V and 3x400V 50Hz (400V: factory default). For more information about input supply refer to the technical specification section of this manual and to the rating plate of the machine.

If it is necessary to change the input voltage:

- The input cable must be disconnected from the mains supply and the machine switched OFF.
- Remove the big side cover from the machine.
- Reconnect X6 according to the diagram below.



- Replace the big side cover.

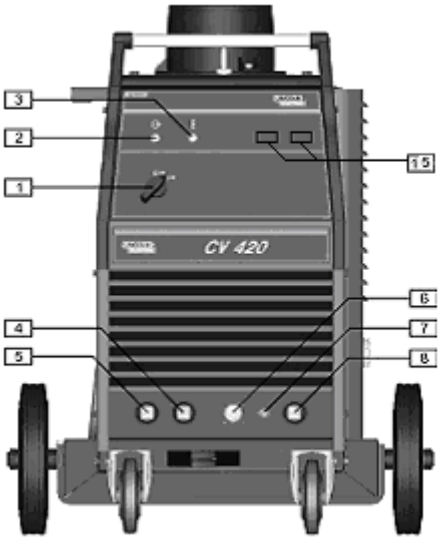
Make sure that the amount of mains power available from the input supply (connection) is adequate for normal operation of the machine. The necessary delayed fuse (or circuit breaker with "D" characteristic) and cable sizes are indicated in the technical specification section of this manual.

Refer to points [1] and [11] of the images below.

Output Connections

Refer to points [4], [5], [6] and [8] of the images below.

Controls and Operational Features



1. Power Switch ON/OFF (O/I): It controls the machine power input. Be sure the power source is connected to the mains supply before turning power on ("I").

2. Power Indicator Light: It indicates that the power is on.

3. Thermal Indicator Light: It indicates that the machine is overloaded or that the cooling is not sufficient.

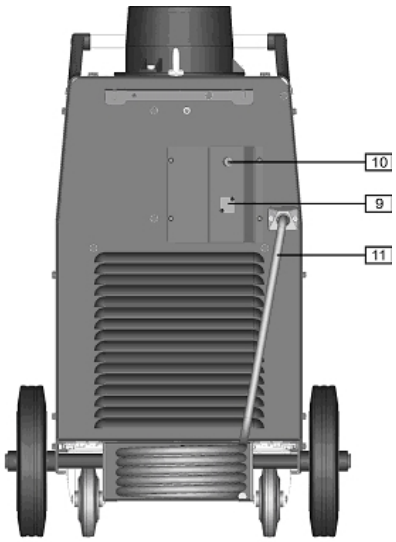
4. Low Inductance Negative Output Socket: The low inductance connection is typically used for short arc welding of mild steel, particularly on thin materials or when using CO_2 shielding gas.

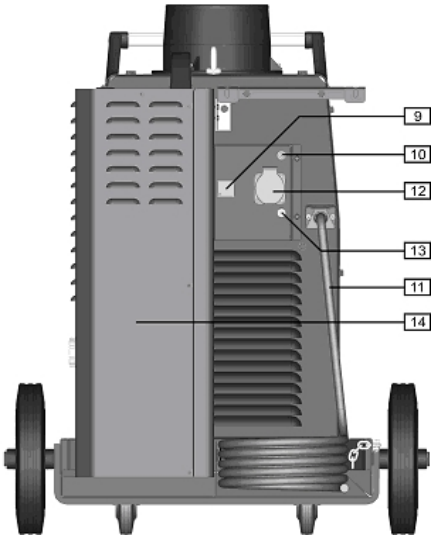
5. High Inductance Negative Output Socket: The high inductance connection is more suitable for short arc welding in heavier work or when using 75% Argon / 25% CO_2 shielding gas. The connection produces a softer arc and a flatter bead with more wash-in than the low inductance connection. Spray type transfer is possible with either connection.

6. Wire Feeder Receptacle: 14-pins receptacle for wire feeder. Provides connections for auxiliary power of wire feeder.

7. Wire Feeder Voltmeter Switch: This switch selects the polarity of the wire feeder voltmeter, if so equipped. When the welding torch is positive (MIG, Outershield and some Innershield processes), set the switch to "+". When the welding torch is negative (most Innershield applications), set the switch to "-".

8. Positive Output Socket: Allows the connection, with the power cable, to the wire feeder.





9. Covered Hole: For CO_2 gas heater socket (see accessories, K14009-1 CO_2 Socket Kit).

10. Fuse: This fuse protects the wire feeder supply circuit (see Spare Parts).

11. Power Input Cable: Connect the proper plug to the input cable then into the rated output according to appropriate rules. Only qualified personnel shall connect this plug.

12. Cooler Power Supply Socket (For water cooled model only): For supplying the cooler unit. The socket has an output of 230V, 2.5A and is protected by the circuit breaker [13].

13. Circuit Breaker (For water cooled model only): Protects the Cooler Power Supply socket [12]. It shuts off the power supply when the current exceeds 2.5A. Press it to restore the power supply.

14. Cooler (For water cooled model only): It refrigerates the water cooled welding torch. The cooler works continuously.

⚠ WARNING

Read and understand the cooler manual before connecting it to the machine.

15. AV-meters: Available as a kit K14097-1.

Welding Cables Connections

Insert the plug of the work cable into the socket [4] or [5]. The other end of this cable connects to the work piece with the work clamp.

Connect the wire feeder LINC FEED 33 to the power source:

- insert the positive welding cable into the output socket [8].
- insert the wire feeder control cable into the socket [6] (see Accessories, Source/wire feeder cable K10347-PG-xM or K10347-PGW-xM).

Use the shortest possible cable lengths.

Machine and Circuit Protection

The CV420 / CV505 is protected against overheating, overload and accidental short-circuits.

If the machine is overheated, the thermal protection circuit will decrease the output current to 0. The thermal protection indicator [3] will turn on. The thermal protection circuit will turn on the output current again, when the machine is cooled.

The CV420 / CV505 is also electronically protected against overload and accidental short-circuit. The overload and short-circuit protection circuit automatically reduces the output current to a safe value when it detects an overload.

Maintenance

⚠ WARNING

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

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

Any noticeable damage should be reported immediately.

Routine maintenance (everyday)

- Check cables and connections integrity. Replace, if necessary.
- Remove the spatters from the welding gun nozzle. Spatters could interfere with the shielding gas flow to the arc.
- Check the welding gun condition: replace it, if necessary.
- Check condition and operation of the cooling fan. Keep clean its airflow slots.

Periodic maintenance (every 200 working hours but at list once every 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.
- Check and tighten all screws.

⚠ WARNING

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

Transport

⚠ WARNING

To ensure safety transport it is necessary to:

- Lift only power source without gas cylinder, cooler and wire feeder.
- Screw down an eye bolt and apply load axially in 45 degree angle in accordance to the drawing.
- Ensure equal length of lifting lines.

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 if 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 complies with IEC 61000-3-12 provided that the short-circuit power S_{sc} is greater than or equal to 7,76MVA for CV 420 and 9,95MVA for CV 505 at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short circuit power S_{sc} greater than or equal to 7,76MVA (CV 420) and 9,95MVA (CV 505).

Technical Specifications

IDEALARC CV 420 & CV 505

INPUT			
Input Voltage 230 / 400V ± 10% Three Phase	Input Power at Rated Output **420:** 22kVA @ 60% Duty Cycle **505:** 29kVA @ 60% Duty Cycle	EMC Group / Class II / A II / A	Frequency 50 Hz

RATED OUTPUT AT 40°C			
	Duty Cycle (Based on a 10 min. period)	Output Current	Output Voltage
420:	60%	420A	35.0 Vdc
	100%	325A	30.3 Vdc
505:	60%	500A	39.0 Vdc
	100%	385A	33.3 Vdc

OUTPUT RANGE			
	Welding Current Range		Maximum Open Circuit Voltage
420:	30A - 420A	**420:**	43 Vdc
505:	40A - 500A	**505:**	48 Vdc

RECOMMENDED INPUT CABLE AND FUSE SIZES			
	Fuse or Circuit Breaker Size		Input Power Cable
420:	63A (for 230V) Superlag 32A (for 400V) Superlag	**420:**	4 Conductor, 6mm^2
505:	63A (for 230V) Superlag 32A (for 400V) Superlag	**505:**	4 Conductor, 10mm^2

PHYSICAL DIMENSIONS				
	Height	Width	Length	Weight
420:	870 mm	565 mm	1030 mm	139 kg
420 (water version)**:**	870 mm	700 mm	1030 mm	165 kg
505:	870 mm	565 mm	1030 mm	147 kg
505 (water version)**:**	870 mm	700 mm	1030 mm	173 kg

Operating Temperature	Storage Temperature
-10°C to +40°C	-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

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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.

Electrical Schematic

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

Accessories

K10347-PG-xxM	Source/wire feeder cable (gas). Available in 5, 10 or 15m.
K10347-PGW-xxM	Source/wire feeder cable (gas and water). Available in 5, 10 or 15m.
K14009-1	CO_2 Socket Kit.
K14097-1	AV Meter kit.