

POWERTEC 305C PRO, 355C PRO & 425C PRO

OPERATOR'S MANUAL



ENGLISH



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Declaration of conformity



Lincoln Electric Bester Sp. z o.o.

Declares that the welding machine:

POWERTEC 305C PRO
POWERTEC 355C PRO
POWERTEC 425C PRO

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 60974-5, EN 60974-10:2007



16.07.2009

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Operations Director

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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

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Technical Specifications

NAME		INDEX		
POWERTEC 305C PRO		K14057-1		
POWERTEC 355C PRO		K14058-1		
POWERTEC 425C PRO		K14059-1A		
INPUT				
305C PRO	Input Voltage U ₁	EMC Class		Frequency
	230/400V ± 10% 3-phase	A		50/60Hz
	355C PRO			
425C PRO				
305C PRO	Input Power at Rated Cycle	Input Amperes I _{1max}		cos φ
	13,5 kVA @ 40% Duty Cycle	35,2A		0,95
	355C PRO	45,5A		0,95
425C PRO	58A		0,96	
22,8 kVA @ 40% Duty Cycle				
RATED OUTPUT				
305C PRO	Duty Cycle 40°C (based on a 10 min. period)	Output Current		Output Voltage
	100%	175A		22,8 Vdc
	60%	230A		25,5 Vdc
355C PRO	40%	280A		28 Vdc
	100%	220A		25 Vdc
	60%	285A		28,2 Vdc
425C PRO	40%	350A		31,5 Vdc
	100%	265A		27,3 Vdc
	60%	345A		31,3 Vdc
	40%	420A		35 Vdc
OUTPUT RANGE				
305C PRO	Welding Current Range		Open Circuit Voltage	
	30A – 280A		17 – 46 Vdc	
355C PRO	30A – 350A		18 – 48 Vdc	
425C PRO	30A – 420A		17 – 52 Vdc	
RECOMMENDED INPUT CABLE AND FUSE SIZES				
305C PRO	Fuse or Circuit Breaker Size		Power Lead	
	230V	400V		
	D 32A	D 20A	4 Conductor, 4mm ²	
355C PRO	D 40A	D 25A	4 Conductor, 4mm ²	
425C PRO	D 50A	D 32A	4 Conductor, 6mm ²	
DIMENSION				
305C PRO	Weight	Height	Width	Length
	145 kg	890 mm	565 mm	1040 mm
355C PRO	147 kg	890 mm	565 mm	1040 mm
425C PRO	162 kg	890 mm	696 mm	1040 mm
WIRE FEED SPEED RANGE / WIRE DIAMETER RANGE				
305C PRO	WFS RANGE	Solid wires	Aluminum wires	Cored wires
	1 ÷ 20m/min	0.6 ÷ 1.6	1.0 ÷ 1.2	0.9 ÷ 1.6
355C PRO	1 ÷ 20m/min	0.6 ÷ 1.6	1.0 ÷ 1.2	0.9 ÷ 1.6
425C PRO	1 ÷ 20m/min	0.6 ÷ 1.6	1.0 ÷ 1.2	0.9 ÷ 1.6
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

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.

WARNING

This equipment complies with IEC 61000-3-12 provided that the short-circuit power S_{sc} is greater than or equal to:

POWERTEC 305C PRO:	$S_{sc} \geq 1,7 \text{ MVA}$
POWERTEC 355C PRO:	$S_{sc} \geq 2 \text{ MVA}$
POWERTEC 425C PRO:	$S_{sc} \geq 3,5 \text{ MVA}$



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 data on the table above.



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>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.</p>
	<p>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.</p>
	<p>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.</p>
	<p>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.</p>
	<p>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.</p>
	<p>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.</p>
	<p>CE COMPLIANCE: This equipment complies with the European Community Directives.</p>
	<p>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 Equipments (PPE) having filter with a protection degree up to a maximum of 15, as required by EN169 Standard.</p>
	<p>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.</p>
	<p>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.</p>
	<p>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.</p>
	<p>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.</p>
	<p>SAFETY MARK: This equipment is suitable for supplying power for welding operations carried out in an environment with increased hazard of electric shock.</p>

	<p>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.</p>
	<p>MOVING PARTS ARE DANGEROUS: There are moving mechanical parts in this machine, which can cause serious injury. Keep your hands, body and clothing away from those parts during machine starting, operating and servicing.</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

The welding machines of the **POWERTEC C PRO** enable:

- Welding MGAW (MIG/MAG)
- Welding FCAW-GS / FCAW-SS

The following equipment has been added to **POWERTEC 305C PRO** and **355C PRO**:

- CD with Operator's Manual
- Gun holder with screw material
- Work lead - 3m
- Gas hose - 2m
- Hose clamp
- Slow-blow fuse - 3A
- Galvanized chain - 0,35m

The following equipment has been added to **POWERTEC 425C PRO**:

- CD with Operator's Manual
- Gun holder with screw material

- Work lead - 3m
- Gas hose - 2m
- Hose clamp
- Water-cooler hoses – blue (0,4m) and red (0,4m)
- Hose with quick water connector - 0,2m.
- Slow-blow fuse - 3A.

POWERTEC 425C PRO is designed to work with cooler COOL ARC 25.

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.

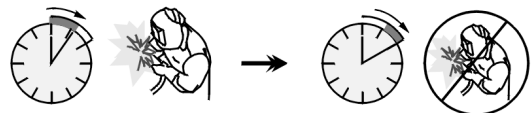
- Do not place or operate this machine on a surface with an incline greater than 15° from horizontal.
- Do not use this machine for pipe thawing.
- This machine must be located where there is free circulation of clean air without restrictions for air movement to and from the air vents. Do not cover the 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.

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:

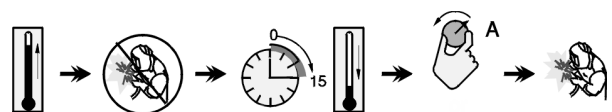


Welding for 6 minutes

Break for 4 minutes

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

The machine is protected from overheating by a temperature sensor.



Minutes

or decrease duty cycle

Input Supply Connection



WARNING

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

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. **POWERTEC 305C PRO, 355C PRO** and **425C PRO** can only be connected to a mating grounded receptacle.

The allowable input voltages are 3x230V 50/60Hz and 3x400V 50/60Hz (3x400V: 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 left side panel from the machine.
- Reconnect X11 and X12 according to the diagram below:

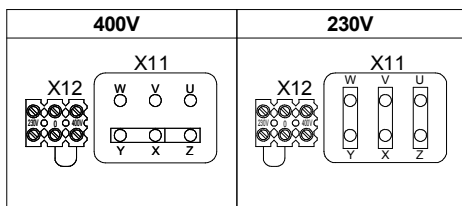


Figure 1.

- Replace the left side panel.

Make sure that the amount of mains power available from the input supply 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 [18] of the images below.

Output Connections

Refer to points [6], [7] and [8] of the images below.

Controls and Operational Features

1. **Power Switch ON/OFF (I/O):** Controls the input power to the machine. Be sure the power source is connected to the mains supply before turning power on ("I"). After input power is connected and the power switch is turned on, the indicator will light up to indicate the machine is ready to weld.



2. **Thermal Overload Indicator:** This lamp will light up when the machine is overheated and the output has been turned off. This can occur if the ambient temperature is above 40°C or the duty cycle of the machine has been exceeded. Leave the machine on to allow the internal components to cool, when the lamp turns off normal operation is possible.



3. **Welding Load Voltage Switch:** Adjust the welding load voltage. **POWERTEC 305C PRO** has 2 switches (2 and 10 steps). **POWERTEC 355C PRO** and **425C PRO** have 2 switches (3 and 10 steps).



WARNING

Do not switch Welding Load Voltage [3] during welding.

4. **Digital Display Panel:** Parameters of welding process are shown.

- Mode Indicators: These lamps show the work mode of the machine:

<input type="radio"/> SYNERGIC	the machine works in synergic mode (automatic mode)
<input type="radio"/>	the machine works in manual mode

- Display A: It shows the actual welding current value (in A), and after finishing welding process, it shows the average value of the welding current. Depending on Work Mode, after the WFS value is changed [5], the display A shows;

<input type="radio"/> SYNERGIC	Correction of the speed automatically matched by the machine, in the range 0.75-1.25
<input type="radio"/>	The value of adjusted WFS in m/min

- Display V: It shows the actual value of welding load voltage (in V), and after finishing welding process, it shows the average value of welding voltage. When the WFS value is changed [5], the display is blank.



5. **WFS (Wire Feed Speed) Control Knob:** Depending on the work mode of the machine, this knob controls:

<input type="radio"/> SYNERGIC	Enables correction of the speed automatically matched by the machine in the range $\pm 25\%$.
<input type="radio"/>	Enables continuous control of wire feeding speed in the range from 1.0 to 20m/min.

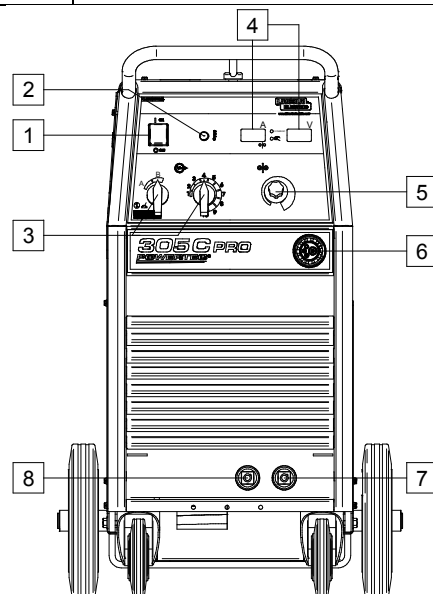


Figure 2.

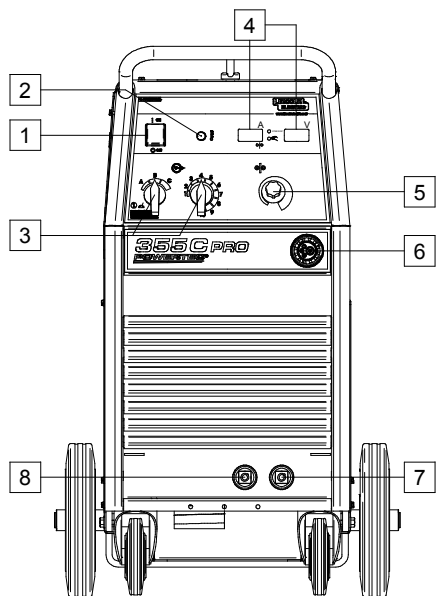


Figure 3.

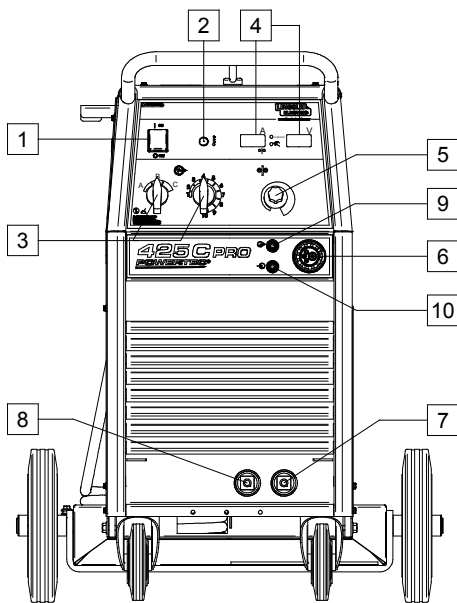


Figure 4.

6. **EURO Socket:** For connecting a welding gun (for GMAW, FCAW-GS / FCAW-SS process).



7. **High Inductance Output Socket:** For connecting a work lead.



8. **Low Inductance Output Socket:** For connecting a work lead.



9. **Quick Connect Coupling (POWERTEC 425C PRO only):** Coolant outlet (supplies cool coolant to the gun).



10. **Quick Connect Coupling (POWERTEC 425C PRO only):** Coolant inlet (takes warm coolant from the gun).



WARNING

Maximum coolant pressure is 5 Bar.



11. **Quick Connect Coupling (POWERTEC 425C PRO only):** Coolant inlet (supplies cool coolant to the welding machines).



12. **Quick Connect Coupling (POWERTEC 425C PRO only):** Coolant outlet (takes warm coolant from welding machines.)



WARNING

Maximum coolant pressure is 5 Bar.



WARNING

Read and understand operator's manual of cooler before connecting it to the machine.



WARNING

To ensure the failure-free work, use only recommended coolant by manufacturer of welding gun and/or cooler (see "Accessories" chapter).

POWERTEC 305C PRO & 355C PRO

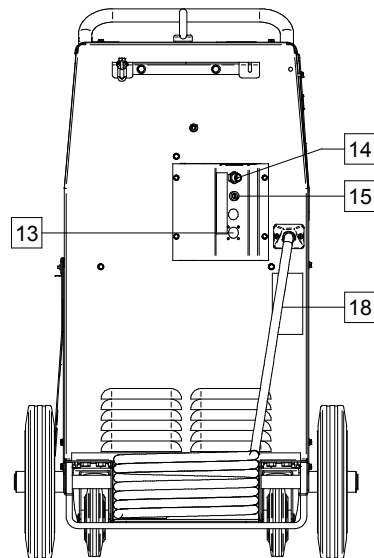


Figure 5.

POWERTEC 425C PRO

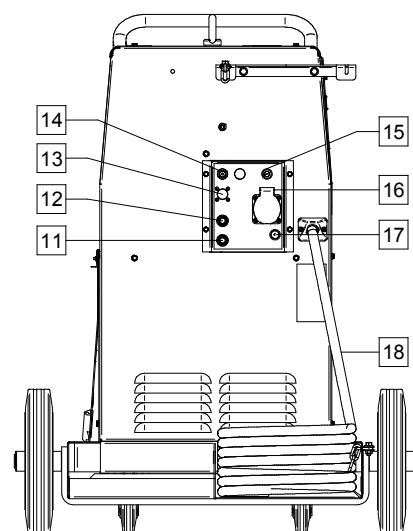


Figure 6.

13. **Hole Plug:** For CO₂ gas heater socket (see "Accessories" chapter - K14009-1 CO₂ Heater Connection Kit).

14. Gas Connector: Connection for gas line.

! WARNING

The welding machine supports all suitable shielding gases at a maximum pressure of 5,0 Bar.

15. Slow-Blow Fuse: It shut off the supply power when the current exceed 3A. After burn out it need to be replaced by new one. (See "Spare Parts" chapter).

POWERTEC			
	305C PRO	355C PRO	425C PRO
Slow-blow fuse	3A	3A	3A

16. Cooler Power Supply Socket (only POWERTEC 425C PRO): For supplying the cooler unit only.

! WARNING

The socket has an output of 230V, 2.5A and is protected by the circuit breaker [17].

17. Circuit Breaker (only POWERTEC 425C PRO): Protects the Cooler Power Supply socket [16]. It shuts off the power supply when the current exceeds 2.5A. Press it to restore the power supply.

18. Power lead (5m): Connect the supply plug to the existing input cable that is rated for the machine as indicated in this manual, and conforms to all applicable standards. This connection shall be performed only by a qualified person.

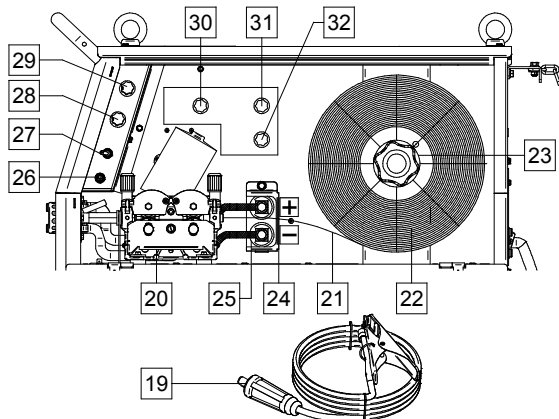


Figure 7.

19. Work Lead.

20. Wire Drive (for GMAW, FCAW-GS / FCAW-SS process): 4-Roll wire drive.

21. Welding Wire (for GMAW, FCAW-GS / FCAW-SS).

22. Spooled Wire (for GMAW, FCAW-GS / FCAW-SS): The machine does not include a spooled wire.

23. Wire Spool Support: Maximum 15kg spools. Accepts plastic, steel and fiber spools onto 51mm spindle. Also accepts Readi-Reel® type spools onto included spindle adapter.

! WARNING

Be sure that the right side panel of machine is closed during welding.

24. Shield of Changing Polarity.

25. Terminal Block of Changing Polarity (for GMAW, FCAW-GS / FCAW-SS process): This terminal block enables to set the welding polarity (+ ; -), which will be given at the welding holder.

! WARNING

Positive (+) polarity is set at the factory.

! WARNING

Before welding check the polarity for using wires.

If the welding polarity has to be changed, user should:

- Switch off the machine.
- Determine the wire polarity for the wire to be used. Consult the wire data for this information.
- Take off the terminal block's shield [24].
- The tips of the wire on the terminal block [25] fix as is shown in the Table 1.
- Put on the terminal block's shield.

! WARNING

The right side panel has to be completely closed during welding.

Table 1.

POSITIVE POLARITY (factory setting)	NEGATIVE POLARITY

26. **Cold Inch / Gas Purge Switch:** This switch enables wire feeding or gas flow without turning on output voltage.
27. **Gun Mode Switch:** It enables selection of 2-step or 4-step gun mode. The functionality of 2T/4T mode is shown in the Figure 8.
28. **Burnback Time Control Knob:** Sets the time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.
29. **Run-in WFS Control Knob:** Sets the wire feed speed from the time the trigger is pulled until an arc is established, in the range from 0.1 to 1.0 of the value set by the "WFS Control Knob" [5].
30. **Wire Diameter Knob:** It allows the choice of the wire diameter requested for the desired welding process. This feature is available only for the synergic mode.
31. **Synergic/Manual Mode Control Knob:** Enables the choice the work of the machine:
- Synergic mode: enables a choice of the welded material and its appropriate gas.
 - Manual mode.
32. **Preflow Gas Control Knob:** Adjusts the time that shielding gas flows after the trigger is pulled and prior to feeding.

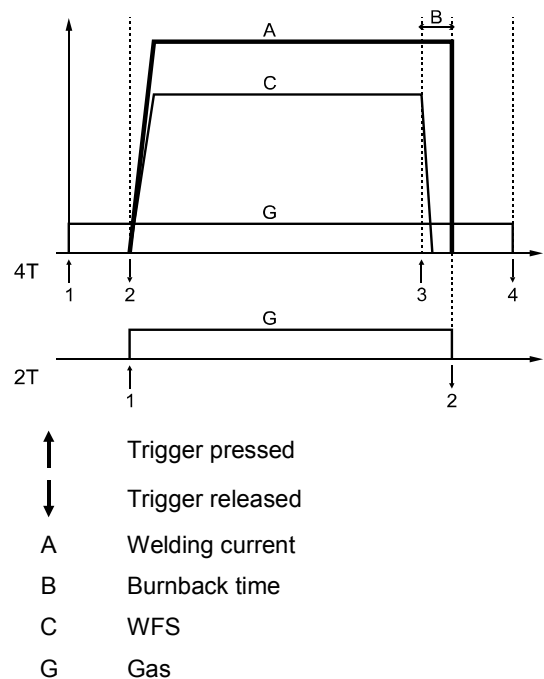


Figure 8.

Welding Cables Connections

Insert the plug of the work lead into the socket [7] or [8]. The other end of this lead connects to the welding piece with the work clamp.

Connect the necessary gun for GMAW, FCAW-GS or FCAW-SS process to the Euro Socket [6]. Contact tip and gun's liner must be adjusted to the type and diameter of using wire.

Wire Spool Loading

Wire spool type S300 and BS300 can be installed on the wire spool support [23] without adapter. Wire spool type S200, B300 or Readi-Reel® can be installed, but the applicable adapter must be purchased. The applicable adapter can be purchased separately (see "Accessories" chapter).

Wire Spool Type S300 & BS300 Loading

WARNING

Turn off the power source while mounting electrode wire.

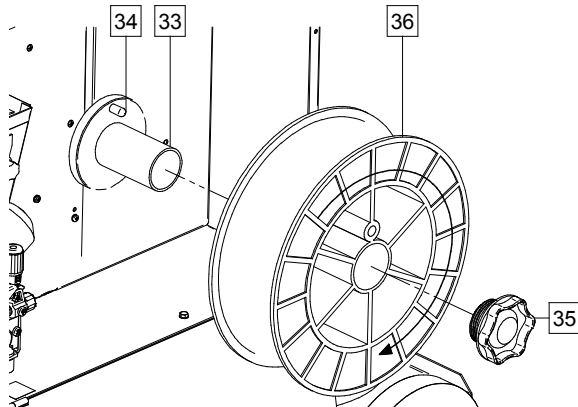


Figure 9.

- Turn the machine off.
- Open the right side panel.
- Unscrew the Locking Nut [35] and remove it from the Spindle [33].
- Place the spool type S300 or BS300 [36] on the Spindle [33] making certain the Spindle Brake Pin [34] is put in the hole in back side of spool type S300 or SB300.

WARNING

Position the spool type S300 or SB300 so that it will rotate in a direction when feeding so as to be de-reeled from bottom of the spool.

- Re-install the locking nut [35]. Make sure that the locking nut is tightened.

Wire Spool Type S200 Loading

WARNING

Turn off the power source while mounting electrode wire.

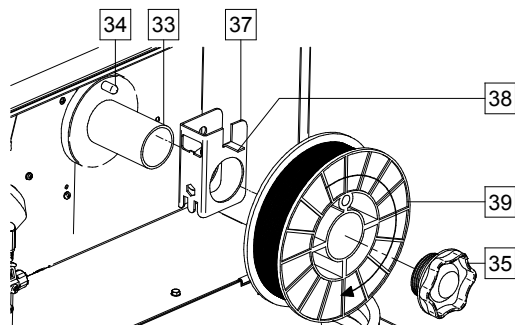


Figure 10.

- Turn the machine off.
- Open the right side panel.
- Unscrew the Locking Nut [35] and remove it from the Spindle [33].
- Place the adapter of spool type S200 [37] on the spindle [33] making certain the spindle brake pin [34] is put in the hole in back side of the adapter [37]. The adapter of spool type S200 can be purchased separately (see "Accessories" chapter).
- Place the spool type S200 [39] on the spindle [33]

making certain that the adapter brake pin [38] is put in the hole in the back side of the spool.

WARNING

Position the spool type S200 so that it will rotate in a direction when feeding so as to be de-reeled from bottom of the spool.

- Re-install the locking nut [35]. Make sure that the locking nut is tightened.

Wire Spool Type B300 Loading

WARNING

Turn off the power source while mounting electrode wire.

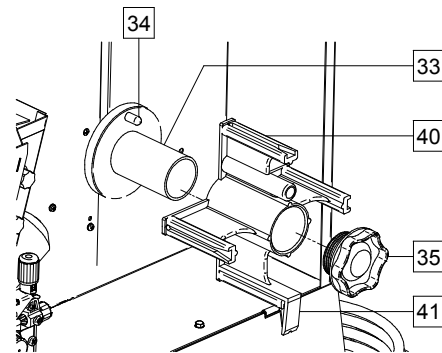


Figure 11.

- Turn the machine off.
- Open the right side panel.
- Unscrew the Locking Nut [35] and remove it from the spindle [33].
- Place the adapter of spool type B300 [40] on the spindle [33]. Make certain that the spindle brake pin [34] is put in the hole in the back side of the adapter. The adapter of spool type B300 can be purchased separately (see "Accessories" chapter).
- Re-install the locking nut [35]. Make sure that the locking nut is tightened.

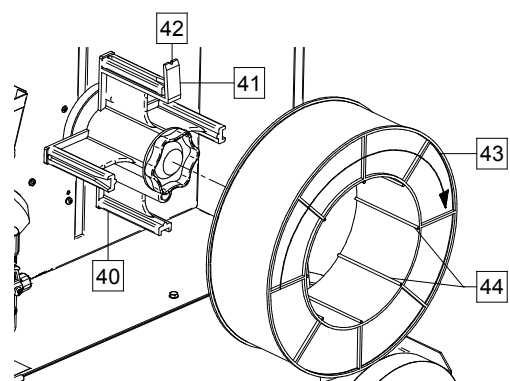


Figure 12.

- Rotate the spindle and adapter so the retaining spring [41] is at the 12 o'clock position.
- Place the spool type B300 [43] on the adapter [40]. Set one of the B300 inside cage wires [44] on the slot [42] in the retaining spring tab [41] and slide the spool onto the adapter.

! WARNING

Position the spool type B300 so that it will rotate in a direction when feeding so as to be de-reeled from bottom of the spool.

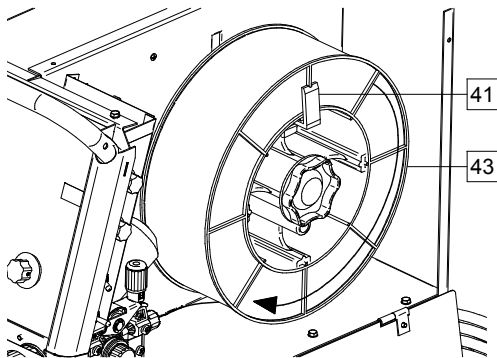


Figure 13.

Wire Spool Type Readi-Reel® Loading

! WARNING

Turn off the power source while mounting electrode wire.

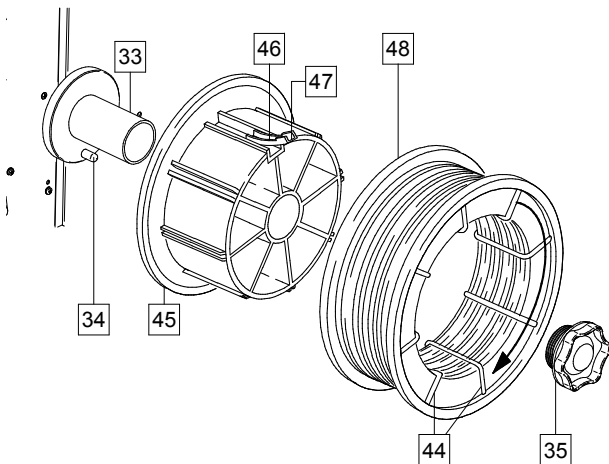


Figure 14.

- Turn the machine off.
- Open the right side panel.
- Unscrew the locking nut [35] and remove it from the spindle [33].
- Place the adapter of spool type Readi-Reel® [45] on the spindle [33]. Make certain that the spindle brake pin [34] is put in the hole in the back side of the adapter. The adapter of spool type Readi-Reel® can be purchased separately (see "Accessories" chapter).
- Re-install the locking nut [35]. Make sure that the locking nut is tightened.
- Rotate the spindle and adapter so the retaining spring [46] is at the 12 o'clock position.
- Place the spool type Readi-Reel® [48] on the adapter [45]. Set one of the Readi-Reel® inside cage wires [44] on the slot [47] in the retaining spring tab [46].

! WARNING

Position the spool type Readi-Reel® so that it will rotate in a direction when feeding so as to be de-reeled from bottom of the spool.

Loading the Electrode Wire

- Turn the machine off.
- Open the right side panel of the machine.
- Unscrew the fastening cap of the sleeve.
- Load the spool with the wire [22] on the sleeve such that the spool turns clockwise when the wire [21] is fed into the wire feeder.
- Make sure that the spool locating pin goes into the fitting hole on the spool.
- Screw in the fastening cap of the sleeve.
- Put on the wire roll using the correct groove corresponding to the wire diameter.
- Free the end of the wire and cut off the bent end making sure it has no burr.

! WARNING

Sharp end of the wire can hurt.

- Rotate the wire spool clockwise and thread the end of the wire into the wire feeder as far as the Euro Socket.
- Adjust force of pressure roll of the wire feeder properly.

Adjustments of Brake Torque of Sleeve

To avoid spontaneous unrolling of the welding wire the sleeve is fitted with a brake.

Adjustment is carried by rotation of its screw M10, which is placed inside of the sleeve frame after unscrewing the locking nut of the sleeve.

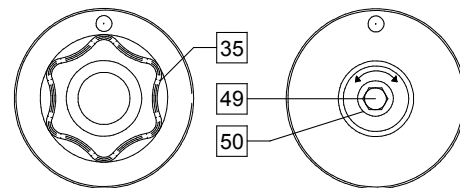


Figure 15.

- 35. Locking Nut.
- 49. Adjusting Screw M10.
- 50. Pressing Spring.

Turning the screw M10 clockwise increases the spring tension and you can increase the brake torque

Turning the screw M10 anticlockwise decreases the spring tension and you can decrease the brake torque.

After finishing of adjustment, you should screw in the locking nut again.

Adjusting Pressure Roll Force

The pressure arm controls the amount of force the drive rolls exert on the wire.

Pressure force is adjusted by turning the adjustment nut clockwise to increase force, counterclockwise to decrease force. Proper adjustment of pressure arm gives the best welding performance.

! WARNING

If the roll pressure is too low the roll will slide on the wire. If the roll pressure is set too high the wire may be deformed, which will cause feeding problems in the welding gun. The pressure force should be set properly. Decrease the pressure force slowly until the wire just begins to slide on the drive roll and then increase the force slightly by turning of the adjustment nut by one turn.

Inserting Electrode Wire into Welding Gun

- Turn the welding machine off.
- Depending on welding process, connect the proper gun to the euro socket, the rated parameters of the gun and of the welding machine should be matched.
- Remote the nozzle from the gun and contact tip or protection cap and contact tip. Next, straighten the gun out flat.
- Insert the wire through the guide tube, over the roller and guide tube of Euro Socket into liner of gun. The wire can be pushed into the liner manually for a few centimeters, and should feed easily and without any force.

! WARNING

If force is required it is likely that the wire has missed the liner of gun.

- Turn the welding machine on.
- Depress the gun trigger to feed the wire through the gun liner until the wire comes out of the threaded end. Or the Cold Inch / Gas Purge Switch [26] can be used – keep in "Cold Inch" position until the wire comes out of the threaded end.
- When trigger or the Cold Inch / Gas Purge Switch [26] is released spool of wire should not unwind.
- Adjust wire spool brake accordingly.
- Turn the welding machine off.
- Install a proper contact tip.
- Depending on the welding process and the type of the gun, install the nozzle (GMAW process, FCAW-GS process) or protection cap (FCAW-SS process).

! WARNING

Take precaution to keep eyes and hands away from the end of the gun while the wire is being come out of the threaded end.

Changing Driving Rolls

POWERTEC 305C PRO, 355C PRO & 425C PRO is equipped with drive roll V1.0/V1.2 for steel wire. For others wire sizes, is available the proper drive rolls kit (see "Accessories" chapter) and follow instructions:

- Turn the welding machine off.

! WARNING

Turn the input power off of the welding power source before installation or changing drive rolls.

- Release the pressure roll levers [51].
- Unscrew the fastening caps [52].
- Open the protection cover [53].
- Change the drive rolls [54] with the compatible ones corresponding to the used wire.

! WARNING

Be sure that the gun liner and contact tip are also sized to match the selected wire size.

! WARNING

For wires with the diameter larger than 1.6mm, the following parts are to be changed:

- The guide tube of the feeding console [55] and [56].
- The guide tube of the Euro Socket [57].
- Replace and tighten the protection cover [53] to the drive rolls.
- Screw fastening caps [52].
- Manually feed the wire from the wire reel, the wire through the guide tube, over the roller and guide tube of Euro Socket into liner of gun.
- Lock the pressure roll levers [51].

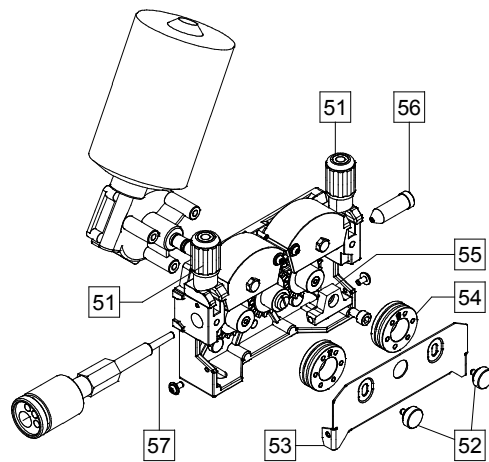


Figure 16.

Gas Connection

- Connect the gas hose to the Gas Connector [18] located on the rear panel of the machine.
- Put the gas cylinder on the machine shelf and secure it with the chain.
- A gas cylinder must be installed with a proper flow regulator.
- Once a gas cylinder with a flow regulator has been securely installed, connect the gas hose to the regulator using the hose clamp.

! WARNING

The welding machine supports all suitable shielding gases at a maximum pressure of 5,0 Bar.

! WARNING

Always fasten gas cylinder properly in vertical position in a special holder on the wall or on a carriage. Remember to close gas cylinder valve after having finished welding.

Connection and Cooler control (only POWERTEC 425C PRO)

POWERTEC 425C PRO is designed to work with cooler **COOL ARC 25** (see "Accessories" chapter).

To connect **COOL ARC 25** to **POWERTEC 425C PRO** see operator's manual for cooler.

The **POWERTEC 425C PRO** allows the cooler to the automatic work:

- When a weld is started, the cooler is automatically switched on.
- When the weld is stopped, the cooler continues to run for about 5min., after this time, it is automatically switched off.
- If the weld is restarted in a time lower than 5min., the cooler continues to run.

The **POWERTEC 425C PRO** has the possibility to switch the automatic work of the cooler off and set it in continuously work. If it is necessary to change the cooler kind of work:

- Switch the **POWERTEC 425C PRO** off.
- Set the knob of the choice wire diameter selection [30] in "1.0" position. Set the knob of the choice welded material and gas [31] in "CRNI (98%AR 2%CO₂)" position.
- Switch the **POWERTEC 425C PRO** on.
- Within 15s switch the knob of the choice wire diameter selection [30] in "1.2" position and the knob of the choice welded material and gas mixture [31] in "STEEL (100%CO₂)" position – the cooler has been switched on and the display "V" has displayed "on".

If it is necessary to return the automatic work of the cooler you should do the foregoing actions again (the display "V" has displayed "5").

WARNING

The display "V" displays information about work mode of the water cooler ("5" / "on") for 2 seconds after the supply of the **POWERTEC 425C PRO** is switched on.

Welding GMAW, FCAW-GS, FCAW-SS Process

POWERTEC 305C PRO, 355C PRO & 405C PRO can be used to welding GMAW, FCAW-GS and FCAW-SS process in Manual Mode.

POWERTEC 305C PRO, 355C PRO & 405C PRO have been provided with synergic GMAW and FCAW-GS process.

POWERTEC 305C PRO, 355C PRO & 405C PRO do not include the gun necessary for GMAW, FCAW-GS or FCAW-SS welding. Depending on the welding process can be purchased separately (see "Accessories" chapter).

Preparation the Machine for Welding GMAW, FCAW-GS and FCAW-SS Process.

Procedure of begin welding of GMAW, FCAW-GS or FCAW-SS process:

- Turn the machine off.
- Place the machine conveniently near the work area in a location to minimize exposure to weld spatter and to avoid sharp bends in the gun cable.
- Determine the wire polarity for the wire to be used. Consult the wire data for this information. If it is necessary, change polarity. See [25] point – Terminal Block of Changing Polarity
- Connect output the gun to GMAW, FCAW-GS or FCAW-SS process to Euro Socket [6].
- Connect the work lead [19] to output socket [7] or [8].
- Connect the work lead to the welding piece with the work clamp.
- Make sure, if it is needed (**POWERTEC 425C PRO** with cooler), that the cooler has been connected.
- Install the proper wire.
- Install the proper drive rolls.
- Manually push the wire into the gun's liner.
- Turn the machine on.
- Insert the wire into the welding gun.

WARNING

Keep the gun cable as straight as possible when loading electrode through cable.

WARNING

Never use defected gun.

- Check gas flow with Gas Purge Switch [26] – GMAW and FCAW-GS process.
- Close the right side panel.
- The welding machine is now ready to weld.

WARNING

The right side panel has to be completely closed during welding.

WARNING

Keep the gun cable as straight as possible when welding or loading electrode through cable.

WARNING

Do not kink or pull cable around sharp corners.

- By applying the principle of occupational health and safety at welding, welding can be begun.

Welding in Manual Mode

When the Control Knob [31] is set in "Manual" position, welding in Manual Mode is possible.

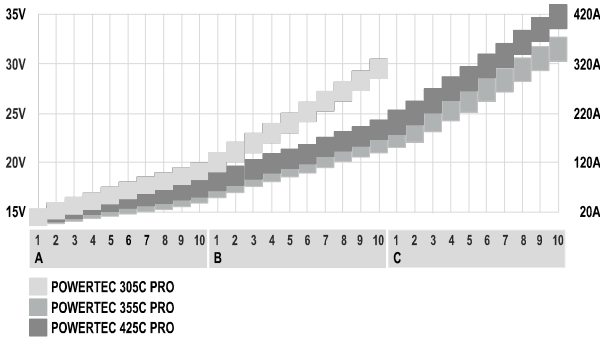
Manual Mode enables welding:

- GMAW
- FACW-GS
- FCAW-SS

In Manual Mode can be set:

- The welding load voltage
- WFS
- Burnback
- Run-in WFS
- Preflow Time
- 2-Step/4-Step

The chart below can be useful for welding setting selection:



The 2-Step - 4-Step changes the function of the gun's trigger.

- 2 Step trigger operation turns welding on and off in direct response to the trigger. Welding process is performed when the gun's trigger is pulled.
- 4-Step mode allows to continue welding, when the gun's trigger is released. To stop welding, the gun's trigger is pulled again. 4-step mode facilitates to making long welds.

The Burnback Time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.

Run-in WFS sets the wire feed speed from the time the trigger is pulled until an arc is established.

Preflow Time adjusts the time that shielding gas flows after the trigger is pulled and prior to feeding.

Welding in Synergic Mode

Synergic Mode enables welding GMAW and FCAW-GS process according to Table 2.

Table 2.

		POWERTEC		
		305C PRO	355C PRO	425C PRO
Steel (80%Ar/20%CO ₂)	Ø0.8	X	X	X
	Ø1.0	X	X	X
	Ø1.2	X	X	X
Steel (100%CO ₂)	Ø0.8	X	X	X
	Ø1.0	X	X	X
	Ø1.2	X	X	X
CRNi (98%Ar/2%CO ₂)	Ø0.8	X	X	X
	Ø1.0	X	X	X
	Ø1.2	X	X	X
Aluminum (100% Ar)	Ø1.0	X	X	X
	Ø1.2	X	X	X
CORE* (80%Ar/20%CO ₂)	Ø1.2	X	X	X
	Ø1.6	X	X	X

*Flux-cored wire for FCAW-GS process.

Welding in Synergic Mode is possible when Diameter Wire [30] and Welded Material and Appropriate Gas [31] are set.

WARNING

If the selected welding process does not have synergic mode, three horizontal dashes will appear on the display "A".

In Synergic Mode can be set:

- Wire Diameter
- Welded Material and Appropriate Gas
- The welding load voltage

WARNING

For Synergic Welding Mode the machine automatically select the proper Wire Feeding Speed for each position of the Welding Load Voltage Switch [3]. The automatic speed value can be adjusted in the range of the 25% by the WFS Control Knob [5].

- Burnback
- Run-in WFS
- Preflow Time
- 2-Step/4-Step

The 2-Step - 4-Step changes the function of the gun's trigger.

- 2 Step trigger operation turns welding on and off in direct response to the trigger. Welding process is performed when the gun's trigger is pulled.
- 4-Step mode allows to continue welding, when the gun's trigger is released. To stop welding, the gun's trigger is pulled again. 4-step mode facilitates to making long welds.

The Burnback Time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.

Run-in WFS sets the wire feed speed from the time the trigger is pulled until an arc is established.

Preflow Time adjusts the time that shielding gas flows after the trigger is pulled and prior to feeding.

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 insulation and connections of the work leads and insulation of power lead. If any insulation damage exists replace the lead immediately.
- 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.
- If it is required, clean and tighten all weld terminals.

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 welding machine will be removed, the welding 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.

Transport & Lifting



! WARNING

Falling equipment can cause injury and damage to unit.

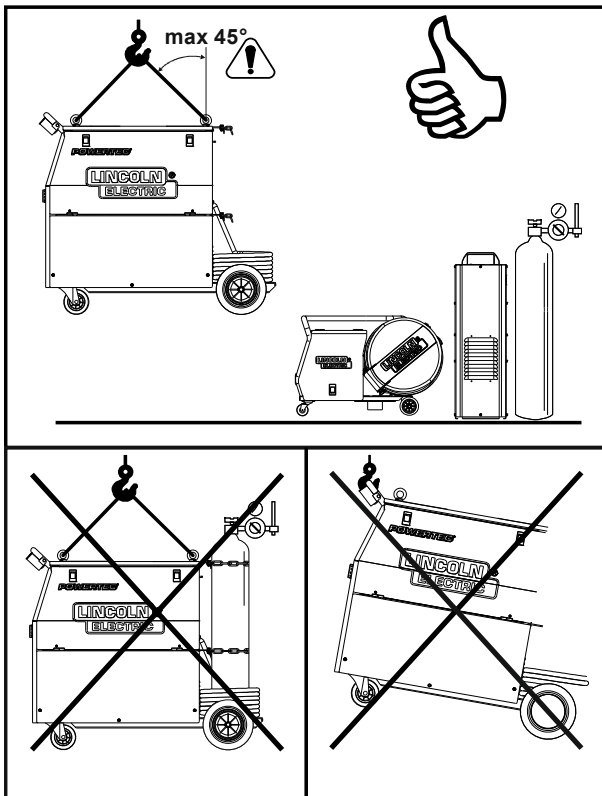


Figure 17.

To safely transport and lift **POWERTEC 305C PRO, 355C PRO & 425C PRO** (see the Figure 17):

- Use equipment of adequate capacity to lift and support unit.
- Always lift and support unit using both eye bolts.
- Do not use one eye bolt to lift or support unit.
- Lift only power source without gas cylinder, cooler and wire feeder, or any other accessories.
- Screw down an eye bolt and apply load axially in 45 degree angle in accordance to the Figure 17.
- Ensure equal length of lifting lines.
- Do not use handle to lift or support unit.

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, that contains a picture-descriptive part number cross-reference.

Electrical Schematic

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

Suggested Accessories

K14037-1	Cooler COOL ARC 25
K10420-1	Coolant Acorox (2x5l)
K14009-1	CO ₂ Heater Connection Kit
K14071-1	Grill Kit POWERTEC C PRO
K14042-1	Adapter for spool type S200
K10158-1	Adapter for spool type B300
K363P	Adapter for spool type Readi-Reel [®]

WORK LEADS

K14011-1	Work Lead 3m (POWERTEC 305C PRO)
K14018-1	Work Lead 3m (POWERTEC 355C PRO & POWERTEC 425C PRO)

LINC GUN™

K10413-24	Gas cooled gun LG 240 G (220A 60%) – 3m, 4m, 5m
K10413-26	Gas cooled gun LG 260 G (260A 60%) – 3m, 4m, 5m
K10413-36	Gas cooled gun LG 360 G (335A 60%) – 3m, 4m, 5m
K10413-42	Gas cooled gun LG 420 G (380A 60%) – 3m, 4m, 5m
K10413-410	Water cooled gun LG 410 W (350A 100%) - 3m, 4m, 5m