

POWERTEC 205C, 255C & 305C

OPERATOR'S MANUAL



ENGLISH



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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

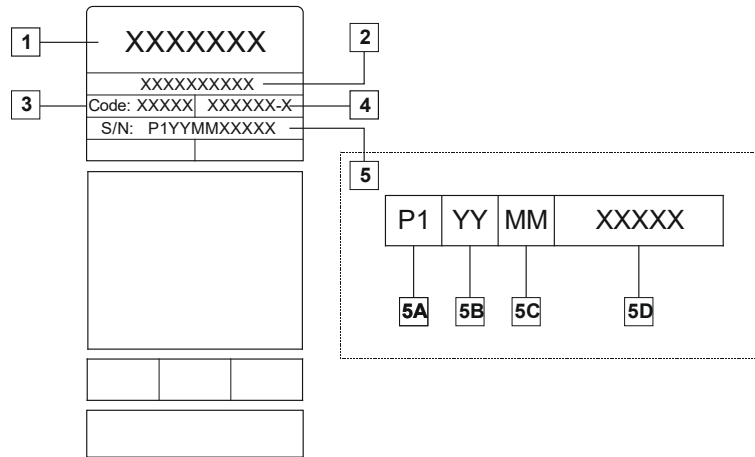
NAME		INDEX		
POWERTEC® 205C 400V		K14054-1		
POWERTEC® 205C 230/400V		K14054-2		
POWERTEC® 255C 400V		K14055-1		
POWERTEC® 255C 230/400V		K14055-2		
POWERTEC® 305C 400V		K14056-1		
POWERTEC® 305C 230/400V		K14056-2		
POWERTEC® 305C 400V		K14056-3		
POWERTEC® 305C 230/400V		K14056-4		
INPUT				
	Input Voltage U ₁	EMC Class	Frequency	
K14054-1	400V ±10%, Three Phase	A	50/60Hz	
K14054-2	230/400V ±10%, Three Phase	A	50/60Hz	
K14055-1	400V ±10%, Three Phase	A	50/60Hz	
K14055-2	230/400V ±10%, Three Phase	A	50/60Hz	
K14056-1	400V ±10%, Three Phase	A	50/60Hz	
K14056-2	230/400V ±10%, Three Phase	A	50/60Hz	
K14056-3	400V ±10%, Three Phase	A	50/60Hz	
K14056-4	230/400V ±10%, Three Phase	A	50/60Hz	
	Input Power at Rated Cycle	Input Amperes I _{1max}	cos φ	
K14054-1	8kVA @ 35 Duty Cycle(40°C)	12A	0,98	
K14054-2	8kVA @ 35 Duty Cycle(40°C)	20A	0,97	
K14055-1	11,4kVA @ 35 Duty Cycle(40°C)	16,5A	0,96	
K14055-2	11,4kVA @ 35 Duty Cycle(40°C)	28,5A	0,96	
K14056-1	15kVA @ 35 Duty Cycle(40°C)	21,5A	0,96	
K14056-2	15kVA @ 35 Duty Cycle(40°C)	36A	0,96	
K14056-3	15kVA @ 35 Duty Cycle(40°C)	21,5A	0,96	
K14056-4	15kVA @ 35 Duty Cycle(40°C)	36A	0,96	
RATED OUTPUT				
	Open Circuit Voltage	Duty Cycle 40°C (based on a 10 min. period)	Output Current	Output Voltage
K14054-1	16 ÷ 39 Vdc	100%	126A	20,3Vdc
		60%	163A	22,2Vdc
		35%	200A	24Vdc
K14054-2	16 ÷ 39 Vdc	100%	126A	20,3Vdc
		60%	163A	22,2Vdc
		35%	200A	24Vdc
K14055-1	16 ÷ 44 Vdc	100%	145A	21,3Vdc
		60%	190A	23,5Vdc
		35%	250A	26,5Vdc
K14055-2	16 ÷ 44 Vdc	100%	145A	21,3Vdc
		60%	190A	23,5Vdc
		35%	250A	26,5Vdc
K14056-1	17÷ 46 Vdc	100%	175A	22,8Vdc
		60%	225A	25,3Vdc
		35%	300A	29Vdc

RATED OUTPUT				
	Open Circuit Voltage	Duty Cycle 40°C (based on a 10 min. period)	Output Current	Output Voltage
K14056-2	17÷ 46 Vdc	100%	175A	22,8Vdc
		60%	225A	25,3Vdc
		35%	300A	29Vdc
K14056-3	17÷ 46 Vdc	100%	175A	22,8Vdc
		60%	225A	25,3Vdc
		35%	300A	29Vdc
K14056-4	17÷ 46 Vdc	100%	175A	22,8Vdc
		60%	225A	25,3Vdc
		35%	300A	29Vdc
WELDING CURRENT RANGE				
	GMAW	FCAW-GS	FCAW-SS	
K14054-1	25A ÷ 200A	25A ÷ 200A	25A ÷ 200A	
K14054-2	25A ÷ 200A	25A ÷ 200A	25A ÷ 200A	
K14055-1	25A ÷ 250A	25A ÷ 250A	25A ÷ 250A	
K14055-2	25A ÷ 250A	25A ÷ 250A	25A ÷ 250A	
K14056-1	30A ÷ 300A	30A ÷ 300A	30A ÷ 300A	
K14056-2	30A ÷ 300A	30A ÷ 300A	30A ÷ 300A	
K14056-3	30A ÷ 300A	30A ÷ 300A	30A ÷ 300A	
K14056-4	30A ÷ 300A	30A ÷ 300A	30A ÷ 300A	
RECOMMENDED INPUT CABLE AND FUSE SIZES				
	Fuse or Circuit Breaker Size		Power Lead	
K14054-1	230V	400V	4 Conductor, 1.5mm ²	
	-	D 10A		
K14054-2	D 20A	D 10A	4 Conductor, 2.5mm ²	
K14055-1	-	D 16A	4 Conductor, 1.5mm ²	
K14055-2	D 25A	D 16A	4 Conductor, 4mm ²	
K14056-1	-	D 20A	4 Conductor, 2.5mm ²	
K14056-2	D 32A	D 20A	4 Conductor, 4mm ²	
K14056-3	-	D 20A	4 Conductor, 2.5mm ²	
K14056-4	D 32A	D 20A	4 Conductor, 4mm ²	
DIMENSION				
	Weight	Height	Width	Length
K14054-1	74 kg	768 mm	427 mm	850 mm
K14054-2	74 kg	768 mm	427 mm	850 mm
K14055-1	95 kg	810 mm	467 mm	932 mm
K14055-2	95 kg	810 mm	467 mm	932 mm
K14056-1	96,5 kg	810 mm	467 mm	932 mm
K14056-2	96,5 kg	810 mm	467 mm	932 mm
K14056-3	96,5 kg	810 mm	467 mm	932 mm
K14056-4	96,5 kg	810 mm	467 mm	932 mm

WIRE DIAMETER / WIRE FEED SPEED RANGE					
	WFS RANGE	Drive roll	Solid wires	Aluminum wires	Cored wires **
K14054-1	1 ÷ 20 m/min	2	0.6 ÷ 1.2	1.0 ÷ 1.2	0.9 ÷ 1.1
K14054-2	1 ÷ 20 m/min	2	0.6 ÷ 1.2	1.0 ÷ 1.2	0.9 ÷ 1.1
K14055-1	1 ÷ 20 m/min	2	0.6 ÷ 1.2	1.0 ÷ 1.2	0.9 ÷ 1.1
K14055-2	1 ÷ 20 m/min	2	0.6 ÷ 1.2	1.0 ÷ 1.2	0.9 ÷ 1.1
K14056-1	1 ÷ 20 m/min	2	0.6 ÷ 1.2	1.0 ÷ 1.2	0.9 ÷ 1.1
K14056-2	1 ÷ 20 m/min	2	0.6 ÷ 1.2	1.0 ÷ 1.2	0.9 ÷ 1.1
K14056-3	1 ÷ 20 m/min	4	0.6 ÷ 1.2	1.0 ÷ 1.2	0.9 ÷ 1.6
K14056-4	1 ÷ 20 m/min	4	0.6 ÷ 1.2	1.0 ÷ 1.2	0.9 ÷ 1.6
Protection Rating		Operating Humidity (t=20°C)		Operating Temperature	
IP23		≤ 95%		from -10°C to +40°C	
				Storage Temperature	
				from -25°C to 55°C	

**Polarity change kit must be purchased (see "Accessories" chapter).

Manufacturer's name, product name, code number, product number, serial number and date of production can be read from rating plate.



Where:

- 1- Manufacturer name and address
- 2- Product name
- 3- Code number
- 4- Product number
- 5- Serial number
- 5A- country of production
- 5B- year of production
- 5C- month of production
- 5D- progressive number different for each machine

Typical gas usage for **MIG/MAG** equipment:

Material type	Wire diameter [mm]	DC electrode positive		Wire Feeding [m/min]	Shielding Gas	Gas flow [l/min]
		Current [A]	Voltage [V]			
Carbon, low alloy steel	0,9 ÷ 1,1	95 ÷ 200	18 ÷ 22	3,5 – 6,5	Ar 75%, CO ₂ 25%	12
Aluminium	0,8 ÷ 1,6	90 ÷ 240	18 ÷ 26	5,5 – 9,5	Argon	14 ÷ 19
Austenic stainless steel	0,8 ÷ 1,6	85 ÷ 300	21 ÷ 28	3 - 7	Ar 98%, O ₂ 2% / He 90%, Ar 7,5% CO ₂ 2,5%	14 ÷ 16
Copper alloy	0,9 ÷ 1,6	175 ÷ 385	23 ÷ 26	6 - 11	Argon	12 ÷ 16
Magnesium	1,6 ÷ 2,4	70 ÷ 335	16 ÷ 26	4 - 15	Argon	24 ÷ 28

Tig Process:

In TIG welding process, gas usage depends on cross-sectional area of the nozzle. For commonly used torches:

Helium: 14-24 l/min

Argon: 7-16 l/min

Notice: Excessive flow rates causes turbulence in the gas stream which may aspirate atmospheric contamination into the welding pool.

Notice: A cross wind or draft moving can disrupt the shielding gas coverage, in the interest of saving of protective gas use screen to block air flow.

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 can be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radio-frequency 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® 205C:	$S_{sc} \geq 0,9 \text{ MVA}$
POWERTEC® 255C:	$S_{sc} \geq 1,3 \text{ MVA}$
POWERTEC® 305C:	$S_{sc} \geq 1,69 \text{ MVA}$

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 have to 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 equipment damage. 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 equipment damage. 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 equipment damage.</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 turned on. Insulate yourself from the electrode, work clamp, and connected work pieces.</p>
	<p>ELECTRICALLY POWERED EQUIPMENT: Turn off the 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>ELECTROMAGNETIC FIELD MAY BE DANGEROUS: Electric current flowing through any conductor creates electromagnetic field (EMF). EMF fields may interfere with some pacemakers, and welders having a pacemaker shall consult their physician before operating this equipment.</p>
 <p style="font-size: small;">Optical radiation emission Category 2 (EN 12198)</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 Equipment (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. To protect the skin, use suitable clothing made of durable, fireproof material. 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 easily accessible. 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 use this equipment when flammable gases, vapors or flammable liquids 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>CYLINDER MAY EXPLODE IF DAMAGED: Use only certificate, 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>
	<p>SAFETY MARK: This equipment is suitable for supplying power for welding operations carried out in an environment with increased risk of electric shock.</p>

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

Introduction

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

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

WARNING

In order to weld the cored wires which requiring negative polarity, polarity change kit must be purchased by user (see "Accessories" chapter).

The following equipment has been added to **POWERTEC® 205C**:

- USB with Operator's Manual
- Work lead - 3m
- Gas hose - 2m
- Hose clamps – 2 units

The following equipment has been added to **POWERTEC® 255C & 305C**:

- USB with Operator's Manual
- Work lead - 3m
- Gas hose - 2m
- Hose clamps – 2 units
- Slow-blow fuse - 2A
- Slow-blow fuse – 6,3A
- Drive roll – V0.8/V1.0 (WARNING: for KNUMBER K14056-3 and K14056-4 included 2 units of drive rolls)

The following equipment was installed to the **POWERTEC® 205C** (see Figure 1.):

1. Gun holder
2. Galvanized chain – 0,7m

The following equipment was installed to the **POWERTEC® 255C & 305C** (see Figure 2.):

1. Gun holder
2. Galvanized chains – 2 units x 0,7m
3. Eye bolts – 2 units

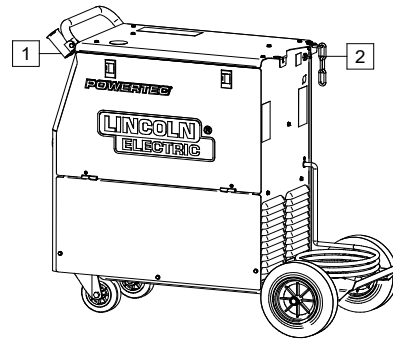


Figure 1.

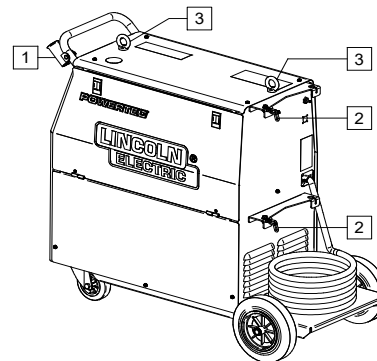


Figure 2.

For GMAW, FCAW-GS and FCAW-SS process, the technical specification describes:

- Type of welding wire
- Wire diameter

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

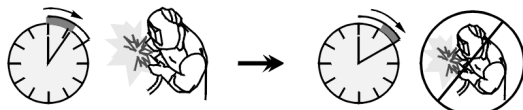
This machine will operate in harsh environments. However, it is important that simple preventative measures are followed to assure long life and reliable operation:

- 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

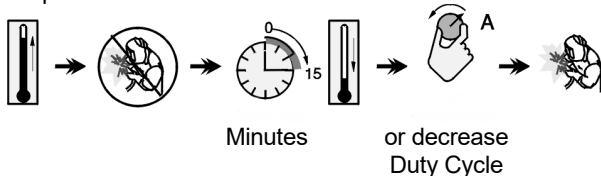


Welding for 6 minutes.

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.



When the machine is overheated the Thermal Overload Indicator light will turn "ON" on the front panel and the output of the machine will turn "OFF". When the machine has cooled to a safe temperature the Thermal Indicator Overload light will go out and the machine may resume normal operation. Note: For safety reasons the machine will not come out of thermal shutdown if the trigger on the welding gun has not been released.

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.

For machines having the following KNUMBER:

- K14054-1, K14055-1, K14056-1, K14056-3: the allowable input voltage is 3x400V 50/60Hz.
- K14054-2, K14055-2, K14056-2, K14056-4: the allowable input voltages are 3x230V 50/60Hz and 3x400V 50/60Hz (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 left side panel.
- Reconnect X11 and X12 according to the diagram below:

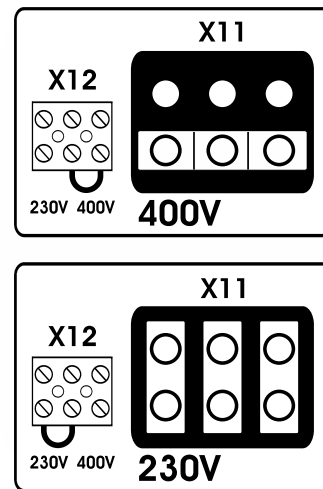


Figure 3.

- 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.

Output Connections

Refer to points [6], [7] and [8] in the Figure 4.

Controls and Operational Features

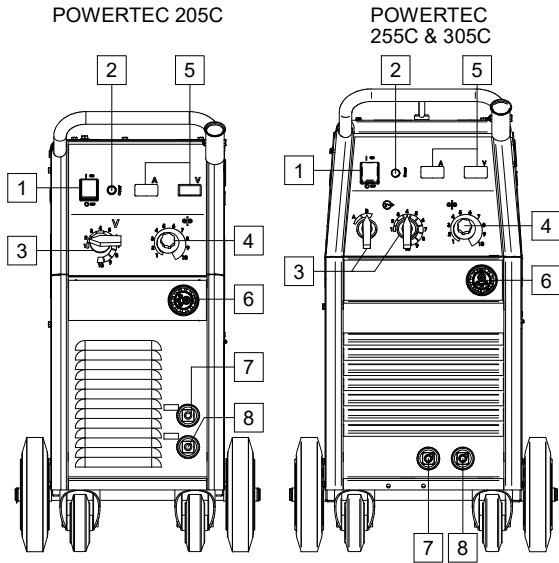




Figure 4.


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 power switch 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® 205C has 1 switch (10 steps). POWERTEC 255C® and 305C have 2 switches (2 and 10 steps).


! WARNING


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

 4. **WFS (Wire Feeding Speed) Control Knob:** It enables continuous control of wire feeding speed in the range from 1 to 20 m/min.

5. **Digital Display Panel:** Available as an option(see "Accessories" chapter).

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

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

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

POWERTEC 205C

POWERTEC 255C & 305C

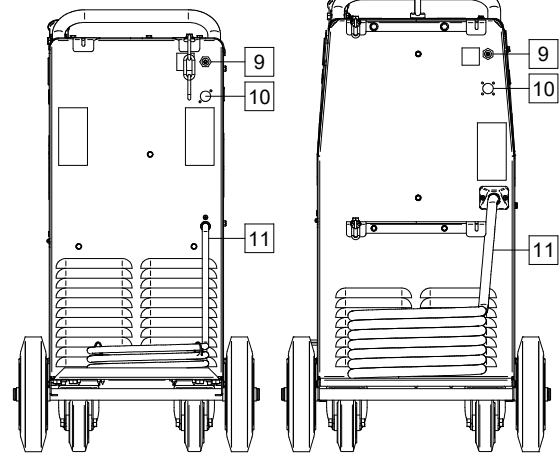



Figure 5.

 9. **Gas Connector:** Connection for gas line.

! WARNING

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

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

11. **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.

K14054-1 POWERTEC 205C 400V
K14054-2 POWERTEC 205C 230/400V

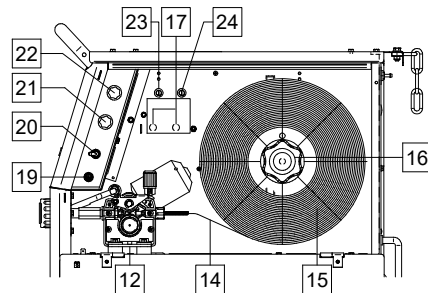


Figure 6.

K14055-1 POWERTEC 255C 400V
K14055-2 POWERTEC 255C 230/400V
K14056-1 POWERTEC 305C 400V
K14056-2 POWERTEC 305C 230/400V

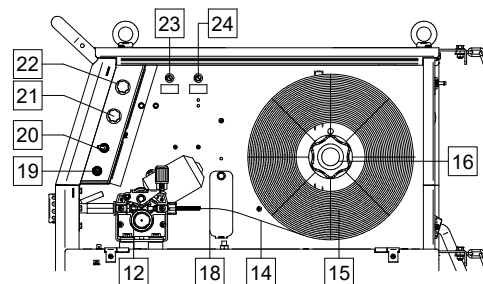


Figure 7.

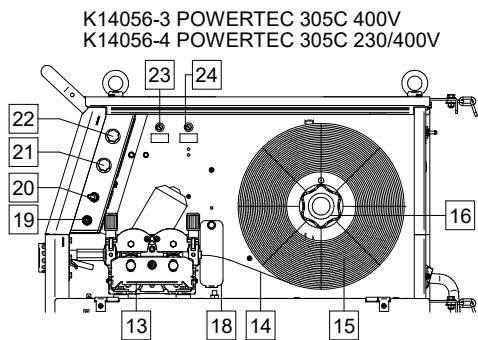


Figure 8.

12. Wire Drive (for GMAW, FCAW-GS / FCAW-SS process): 2-roll wire drive. Only For machines having the following KNUMBER:

- K14054-1 POWERTEC® 205C 400V
- K14054-2 POWERTEC® 205C 230/400V
- K14055-1 POWERTEC® 255C 400V
- K14055-2 POWERTEC® 255C 230/400V
- K14056-1 POWERTEC® 305C 400V
- K14056-2 POWERTEC® 305C 230/400V

13. Wire Drive (for GMAW, FCAW-GS / FCAW-SS process): 4-roll wire drive. Only For machines having the following KNUMBER:

- K14056-3 POWERTEC® 305C 400V
- K14056-4 POWERTEC® 305C 230/400V

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

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

16. 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.

17. Holes for Polarity Changing Kit: see "Accessories" chapter. Only For machines having the following KNUMBER:

- K14054-1 POWERTEC® 205C 400V
- K14054-2 POWERTEC® 205C 230/400V

! WARNING

Positive (+) polarity is set at the factory.

! WARNING

Before welding check the polarity for using wires.

18. Cover of Changing Polarity: Covering holes for Changing Polarity Kit, which can be purchased separately (see "Accessories" chapter). Only For machines having the following KNUMBER:

- K14055-1 POWERTEC® 255C 400V
- K14055-2 POWERTEC® 255C 230/400V
- K14056-1 POWERTEC® 305C 400V
- K14056-2 POWERTEC® 305C 230/400V
- K14056-3 POWERTEC® 305C 400V
- K14056-4 POWERTEC® 305C 230/400V

! WARNING

Positive (+) polarity is set at the factory.

! WARNING

Before welding check the polarity for using wires.

19. Cold Inch / Gas Purge Switch: This switch enables wire feeding or gas flow without turning on output voltage.

20. 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 9.

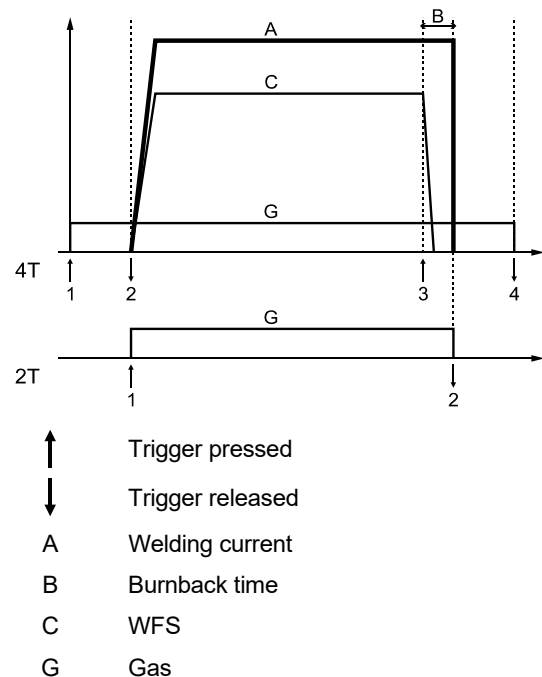


Figure 9.

21. 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.

22. Spot Welding Time Control Knob: Adjusts the time welding will continue even if the trigger is still pulled. This option has no effect in 4-Step Trigger Mode.

! WARNING

Spot Timer has no effect in 4-Step Trigger Mode.

23. Slow-Blow Fuse, F1: Shuts off the supply power when the current exceeds 2A in primary cable. After the fuse burns out, it must be replaced with a new one. (See "Spare Parts" chapter).

POWERTEC®			
	205C	255C	305C
Slow-blow fuse , F1	2A	2A	2A

24. Slow-Blow Fuse, F2: Shuts off the supply power when the current exceeds 6,3A in secondary cable. After the fuse burns out, it must be replaced with a new one. (See "Spare Parts" chapter).

POWERTEC®			
	205C	255C	305C
Slow-blow fuse , F2	6,3A	6,3A	6,3A

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 [16] 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.

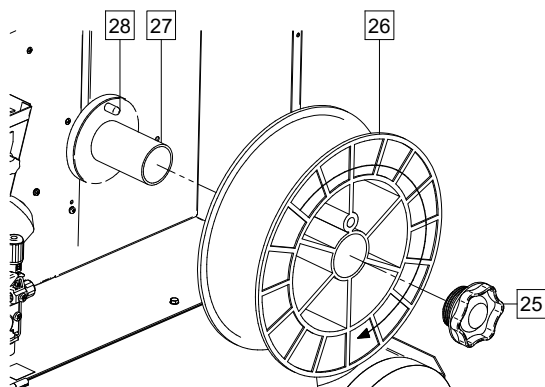


Figure 10.

- Turn the machine off.
- Open the right side panel.
- Unscrew the Locking Nut [25] and remove it from the Spindle [27].

- Place the spool type S300 or BS300 [26] on the Spindle [27] making certain the Spindle Brake Pin [28] 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 [25]. Make sure that the locking nut is tightened.

Wire Spool Type S200 Loading

! WARNING

Turn off the power source while mounting electrode wire.

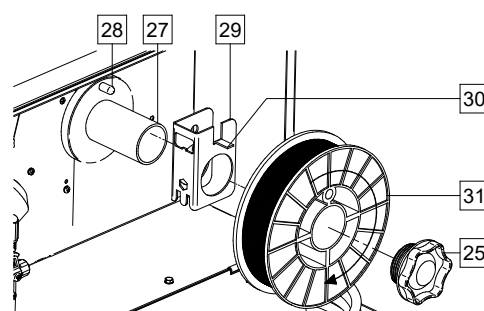


Figure 11.

- Turn the machine off.
- Open the right side panel.
- Unscrew the Locking Nut [25] and remove it from the Spindle [27].
- Place the adapter of spool type S200 [29] on the spindle [27] making certain the spindle brake pin [28] is put in the hole in back side of the adapter [29]. The adapter of spool type S200 can be purchased separately (see "Accessories" chapter).
- Place the spool type S200 [31] on the spindle [27] making certain that the adapter brake pin [30] 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 [25]. Make sure that the locking nut is tightened.

Wire Spool Type B300 Loading

WARNING

Turn off the power source while mounting electrode wire.

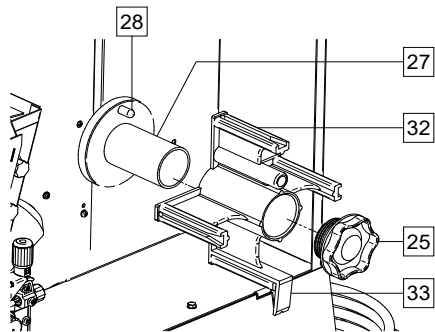


Figure 12.

- Turn the machine off.
- Open the right side panel.
- Unscrew the Locking Nut [25] and remove it from the spindle [27].
- Place the adapter of spool type B300 [32] on the spindle [27]. Make certain that the spindle brake pin [28] 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 [25]. Make sure that the locking nut is tightened.

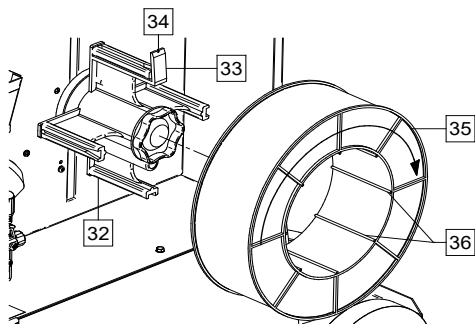


Figure 13.

- Rotate the spindle and adapter so the retaining spring [33] is at the 12 o'clock position.
- Place the spool type B300 [35] on the adapter [32]. Set one of the B300 inside cage wires [36] on the slot [34] in the retaining spring tab [33] 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.

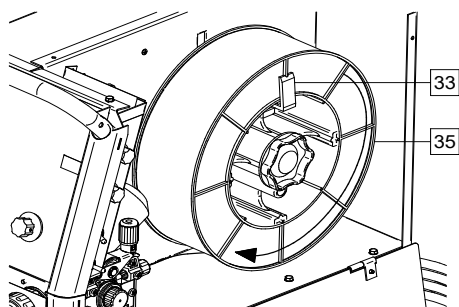


Figure 14.

Wire Spool Type Readi-Reel® Loading

WARNING

Turn off the power source while mounting electrode wire.

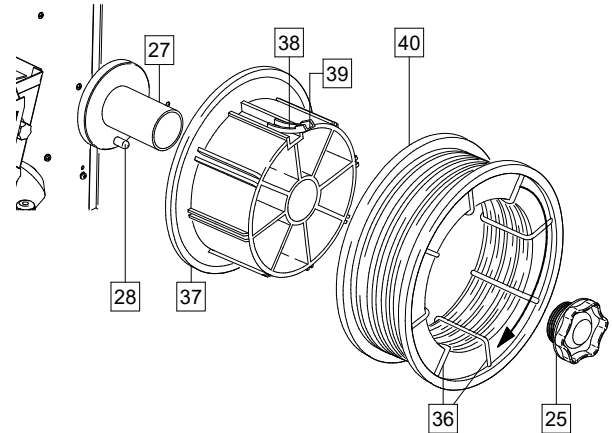


Figure 15.

- Turn the machine off.
- Open the right side panel.
- Unscrew the locking nut [25] and remove it from the spindle [27].
- Place the adapter of spool type Readi-Reel® [37] on the spindle [27]. Make certain that the spindle brake pin [28] 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 [25]. Make sure that the locking nut is tightened.
- Rotate the spindle and adapter so the retaining spring [38] is at the 12 o'clock position.
- Place the spool type Readi-Reel® [40] on the adapter [37]. Set one of the Readi-Reel® inside cage wires [36] on the slot [39] in the retaining spring tab [38].

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 locking nut of the sleeve [16].
- Load the spool with the wire on the sleeve such that the spool turns clockwise when the wire [14] is fed into the wire feeder.
- Make sure that the spindle brake pin [28] goes into the fitting hole on the spool.
- Screw in the locking nut 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.

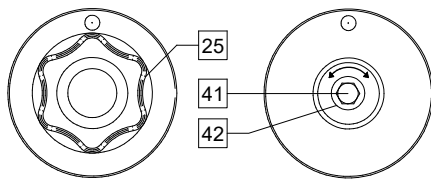


Figure 16.

- 25. Locking Nut.
- 41. Adjusting Screw M10.
- 42. 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 [19] 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 [19] 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

WARNING

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

POWERTEC® 205C is equipped with drive roll V0.8/V1.0 for steel wire.

POWERTEC® 255C & 305C 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.
- Release the pressure roll lever /levers [43].
- Unscrew the fastening cap / caps [44].
- Open the protection cover [45].
- Change the drive roll / rolls [46] 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 [47] and [48].
 - The guide tube of the Euro Socket [49].
- Replace and tighten the protection cover [45] to the drive rolls.
 - Screw fastening cap / caps [44].
 - 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 lever / levers [43].

K14054-1 POWERTEC 205C 400V
K14054-2 POWERTEC 205C 230/400V
K14055-1 POWERTEC 255C 400V
K14055-2 POWERTEC 255C 230/400V
K14056-1 POWERTEC 305C 400V
K14056-2 POWERTEC 305C 230/400V

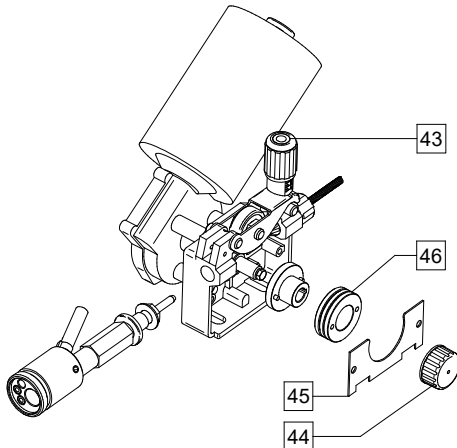


Figure 17.

K14056-3 POWERTEC 305C 400V
K14056-4 POWERTEC 305C 230/400V

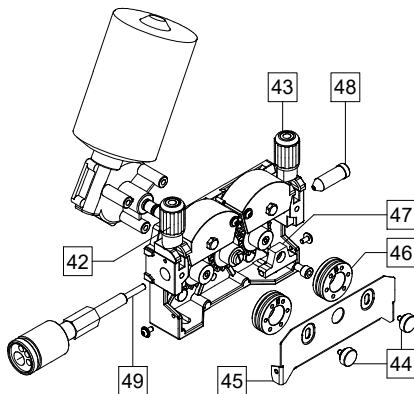


Figure 18.

Gas Connection

- Connect the gas hose to the Gas Connector [9] 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.

! WARNING

Gas cylinder can be fasten on the machine's shelf, but the height of gas cylinder doesn't have to be higher than 43in/1,1m. See the Figure 19. The gas cylinder which is fastened on the machine's shelf has to be secured by attaching it to the machine using the chain.

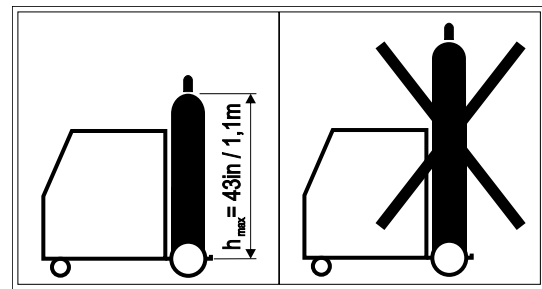


Figure 19.

Welding GMAW, FCAW-GS, FCAW-SS Process

POWERTEC® 205C, 255C & 305C can be used to welding GMAW, FCAW-GS and FCAW-SS process in Manual Mode.

POWERTEC® 205C, 255C & 305C 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 [17] or [18] point – Terminal Block of Changing Polarity.
- Connect output the gun to GMAW, FCAW-GS or FCAW-SS process to Euro Socket [6].
- Make a sure, if it is needed (GMAW, FCAW-GS process), that the gas shield has been connected.
- Connect the work lead to output socket [7] or [8].
- Connect the work lead to the welding piece with the work clamp.
- Install the proper wire.
- Install the proper drive roll.
- 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 [19] – 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.

Transport & Lifting



WARNING

Falling equipment can cause injury and damage to unit.

To safety transport and lift POWERTEC® 205C (see the Figure 20):

- Does not include the eye bolt which can be used to transport or lifting the machine.
- Use equipment of adequate capacity to lift and support unit. Use a travers and minimum two belts as is shown of Figure 20.
- Lift only power source without gas cylinder, cooler and wire feeder, or/and any other accessories.
- Apply load axially in 45 degree angle in accordance to the Figure 20.
- Ensure equal length of lifting lines.
- Do not use handle to lift or support unit

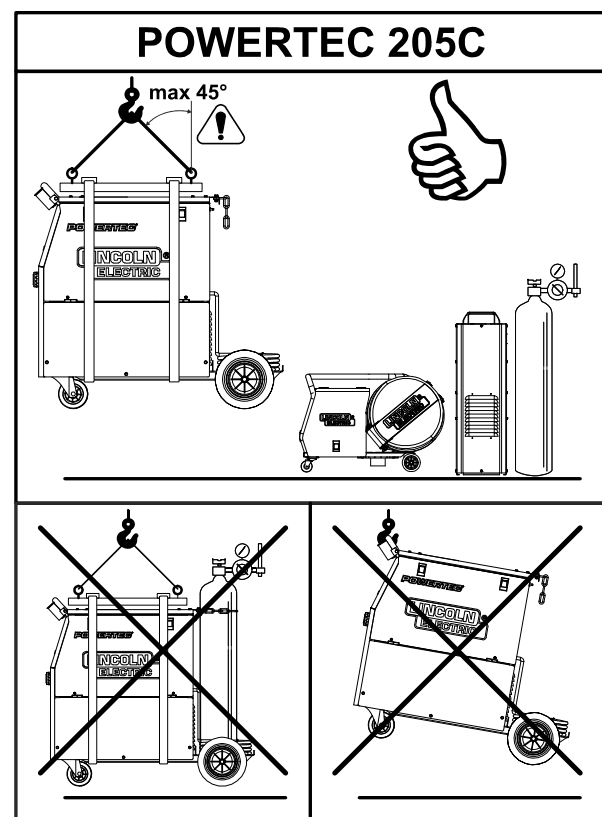


Figure 20.

To safely transport and lift POWERTEC® 255C & 305C (see the Figure 21):

- 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 21.
- Ensure equal length of lifting lines.
- Do not use handle to lift or support unit.

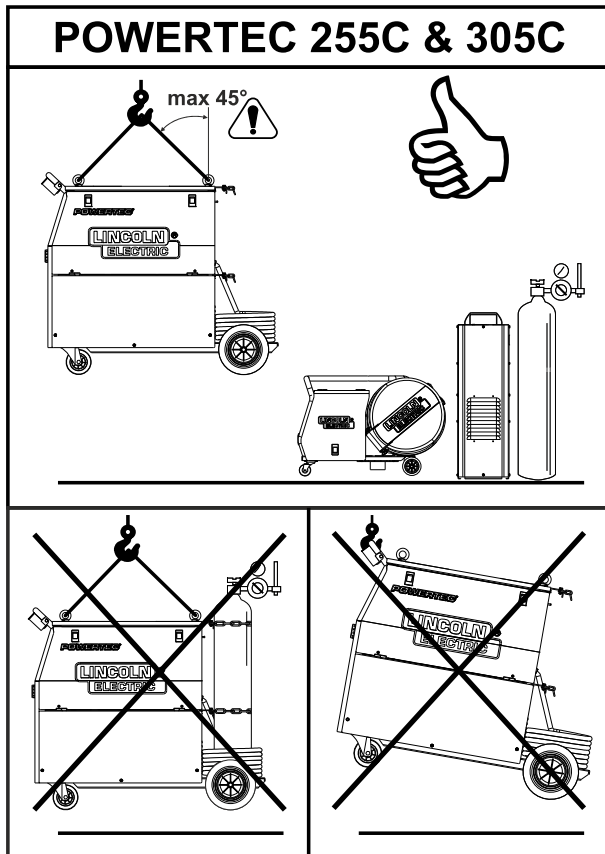


Figure 21.

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.

Customer Assistance Policy

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

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

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.

Spare Parts

12/05

Part List reading instructions

- Do not use this part list for a machine if its code number is not listed. Contact the Lincoln Electric Service Department for any code number not listed.
- Use the illustration of assembly page and the table below to determine where the part is located for your particular code machine.
- Use only the parts marked "X" in the column under the heading number called for in the assembly page (# indicate a change in this printing).

First, read the Part List reading instructions above, then refer to the "Spare Part" manual supplied with the machine, that contains a picture-descriptive part number cross-reference.

Authorized Service Shops Location

09/16

- The purchaser must contact a Lincoln Authorized Service Facility (LASF) about any defect claimed under Lincoln's warranty period.
- Contact your local Lincoln Sales Representative for assistance in locating a LASF or go to www.lincolnelectric.com/en-gb/Support/Locator.

Electrical Schematic

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

Accessories

K14009-1	CO ₂ Socket Kit (24VAC/80W).
K14049-1	AV Meter Kit.
K14076-1	Polarity change kit POWERTEC® 205C.
K14077-1	Polarity change kit POWERTEC® 255C, 305C.
K14042-1	Adapter for spool type S200.
K10158-1	Adapter for spool type B300.
K363P	Adapter for spool type Readi-Reel®.
WORK LEADS	
K14010-1	Work Lead 3m - GRD-200A-25-3M (POWERTEC® 205C).
K14011-1	Work Lead 3m - GRD-250A-35-3M (POWERTEC® 255C)
K14012-1	Work Lead 3m - GRD-300A-35-3M (POWERTEC® 305C)
LINC GUN™	
K10413-15	Gas cooled gun LG 150 G (150A 60%) – 3m, 4m, 5m.
K10413-25	Gas cooled gun LG 250 G (220A 60%) – 3m, 4m, 5m.
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.
Drive rolls to 2 driven rolls	
KP14016-0.8	Solid wires: V0.6 / V0.8
KP14016-1.0	V0.8 / V1.0
KP14016-1.0	V1.0 / V1.2
KP14016-1.2A	Aluminum wires: U1.0 / U1.2
KP14016-1.1R	Cored wires: VK0.9 / VK1.1
Drive rolls to 4 driven rolls	
KP14017-0.8	Solid wires: V0.6 / V0.8
KP14017-1.0	V0.8 / V1.0
KP14017-1.2	V1.0 / V1.2
KP14017-1.2A	Aluminum wires: U1.0 / U1.2
KP14017-1.1R	Cored wires: VK0.9 / VK1.1
KP14017-1.6R	VK1.2 / VK1.6