IM3003
12/2008
Rev. 1

Compact 250

OPERATOR'S MANUAL

BESTER S.A.
ul. Jana III Sobieskiego 19A, 58-260 Bielawa, Poland
www.lincolnelectric.com

Declaration of conformity

BESTER S. A.

Declares that the welding machine:

Compact 250 **s/n**

conforms to the following directives:

73/23/CEE, 93/68/CEE, 89/336/CEE, 92/31/CEE

and has been designed in conformance with the following norms:

EN 50199, EN 60974-1

BESTER S.A., ul. Jana III Sobieskiego 19A, 58-260 Bielawa, Poland

06/03

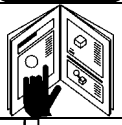
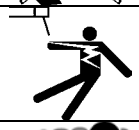
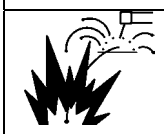
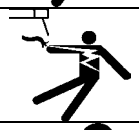
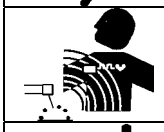
INDEX

Safety

06/03

WARNING

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

	WARNING: This symbol indicates that instructions must be followed to avoid serious personal injury, loss of life, or damage to this equipment. Protect yourself and others from possible serious injury or death.
	READ AND UNDERSTAND INSTRUCTIONS: Read and understand this manual before operating this equipment. Arc welding can be hazardous. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment.
	ELECTRIC SHOCK CAN KILL: Welding equipment generates high voltages. Do not touch the electrode, work clamp, or connected work pieces when this equipment is on. Insulate yourself from the electrode, work clamp, and connected work pieces.
	FUMES AND GASES CAN BE DANGEROUS: Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. To avoid these dangers the operator must use enough ventilation or exhaust to keep fumes and gases away from the breathing zone.
	ARC RAYS CAN BURN: Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers. Protect other nearby personnel with suitable, non-flammable screening and warn them not to watch the arc nor expose themselves to the arc.
	WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION: Remove fire hazards from the welding area and have a fire extinguisher readily available. Welding sparks and hot materials from the welding process can easily go through small cracks and openings to adjacent areas. Do not weld on any tanks, drums, containers, or material until the proper steps have been taken to insure that no flammable or toxic vapors will be present. Never operate this equipment when flammable gases, vapors or liquid combustibles are present.
	ELECTRICALLY POWERED EQUIPMENT: Turn off input power using the disconnect switch at the fuse box before working on this equipment. Ground this equipment in accordance with local electrical regulations.
	ELECTRICALLY POWERED EQUIPMENT: Regularly inspect the input, electrode, and work clamp cables. If any insulation damage exists replace the cable immediately. Do not place the electrode holder directly on the welding table or any other surface in contact with the work clamp to avoid the risk of accidental arc ignition.
	ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS: Electric current flowing through any conductor creates electric and magnetic fields (EMF). EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before operating this equipment.
	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.
	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.
	CE COMPLIANCE: This equipment complies to the European Communities directives.

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

Installation and Operator Instructions

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

Location and Environment

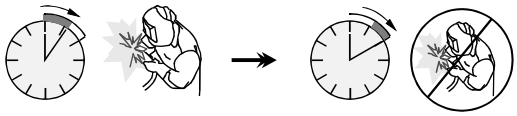
This machine will operate in harsh environments. However, it is important that simple preventative measures are followed to assure long life and reliable operation.

- Do not place or operate this machine on a surface with an incline greater than 15° from horizontal.
- 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 IP21. 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.

Work Cycle and Overheating

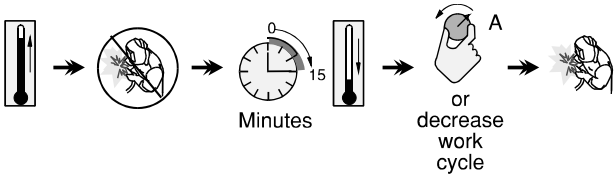
- The work cycle of welding machine is a percentage participation of 10 minutes at which the welder can weld at the rated value of the welding current, without overheating and necessary break time of work.
- Excessive extension of the work cycle will cause activity of the thermal protection circuit.

60% work cycle



welding for 6 minutes break for 4 minutes

- The welder is protected against excessive overheating from the transformer by yhe thermal limiter. Activation of the thermal protection is indicate by the signalling lamp. Afer cooling down of winding to the safe temperature the welder automatically switches on and signalling lamp lights out.



Preparation for Work

MAINS SUPPLY VOLTAGE

- Installation and mains outlet socket should be made and protected according to appropiate rules.
- Mains supply to the machine must be earthed.
- Ensure machine is switched off before connecting mains supply.

Return Welding Cable Connection

- Insert plug of the return welding cable into the socket and screw inti the end.
- Connect other end of this cable to the welded piece with the work clamp.

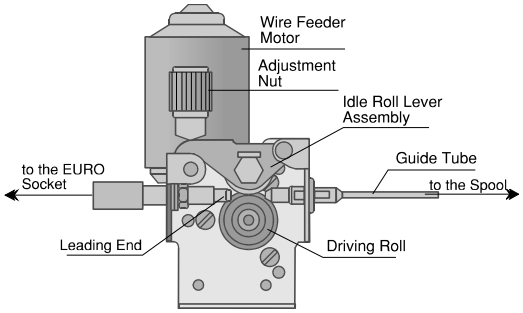
Welding Torch Connection

- Insert the welding cable into the socket and fasten it by the nut of the welding torch.
- You should remember to equip the welding torch with the contact tip and the wire guide tube suitable for the MIG wire diameter and welded material.

Feeding the MIG Wire

- Raise side cover of the semi-automatic welder.
- Put on the driving roll with the diameter coressponding to the wire diameter.
- Load the spool with the wire onto the sleeve of the semi-automatic welder.
- Adjust the brake torgue of the sleeve with the spool of the MIG wire.
- Insert the MIG wire into the wire feeder.
- Adjust force of presurre roll of the wire feeder.

View and Controls of the Wire Feeder

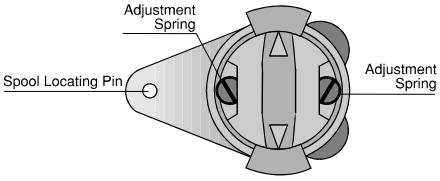


LOADING OF SPOOL WITH MIG WIRE

- Load the wire spool (type A, diameter 300) on the hub assembly in such a way that, by dragging outer end of the wire, the spool runs round clockwise.
- Make sure that the spool locating pin on the hub assembly goes into the fitting hole on the spool.
- Free the end of the wire and cut off the bent end making sure it has no burr.
- Rotate the roll anticlockwise and thread the end of the wire into the entrance guide tube pushing it into the wire guide of the welding torch.

ADJUSTMENT OF BRAKE TORGUE OF HUB

- For avoiding of spontaneous unrollingof the welding wire he hub is fitted with the brake.
- Adjustment is curried by rotation of its two springs, which are placed inside of the sleeve frame.
- Turnning the springs anticlockwise you can increas the brake torque, turnning hem clockwise you can decrease it.



- Adjust the brake torque with a narrow screwdriver (3-4 mm) without dismanting anything.

ELECTRODE WIRE INSERTING INTO FEEDER

- To enable MIG wire inserting into the feeder you should release the pressure roll lever of the feeder.
- Insert the wire end into the guide tube at the rear part of the feeder and carry it over the driving roll and then insert it through the leading end into the guide tube of the torch.
- Pres the wire in the groove of driving roll and lock the pressure roll lever.

ADJUSTING OF FORCE OF PRESSURE ROLL LEVER

- Before welding you should remember about proper stting of the adjustment nut of the pressure force.
- Pressure force is adjusted by turn ot the adjustment nut ; clockwise – force increasing, anticlockwise – force decreasing.

ATTENTION: At too low-pressure force the driving roll slides on the wire. At too high pressure force increases feeding resistance and the wire is deformed and it may cause damage.

INSERTING MIG WIRE INTO WELDING TORCH

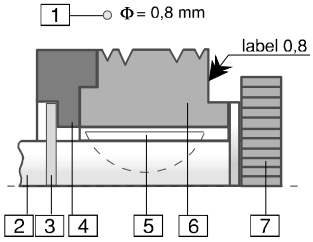
- Set wire feeding speed knob in its central position.
- Ater switching the semi-automatic welder on (the switch in position ‘I’) press the button on the welding torch until the MIG wire leaves the contact tip of the welding torch.
- During this it should be taken precautions for the sake of cut possibility.

ATTENTION: Above action should be done by taking the contact tip off and it should be screwed in after the wire is leaving and switching the semi-automatic welder off.

ASSEMBLING OF THE DRIVING ROLL OF THE WIRE FEEDER

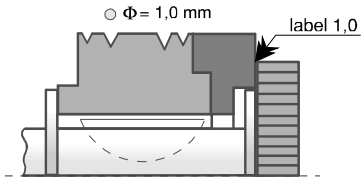
Driving roll should be assembled properly :

❑ Wire roll for the wire with 0,8 mm diameter

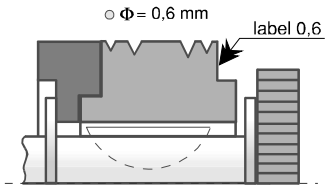


1	wire	5	key
2	motor shaft	6	driving roll
3	mount ring	7	cap
4	ring		

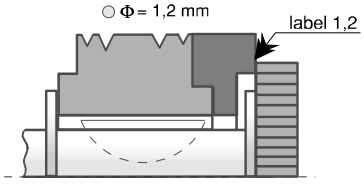
❑ Wire roll for the wire with 1,0 mm diameter



❑ Wire roll for the wire with 0,6 mm diameter



❑ Wire roll for the wire with 1,2 mm diameter



GAS SUPPLYING

PLEASE ENSURE YOU READ THE REGULATOR OPERATING INSTRUCTIONS BEFORE USE.

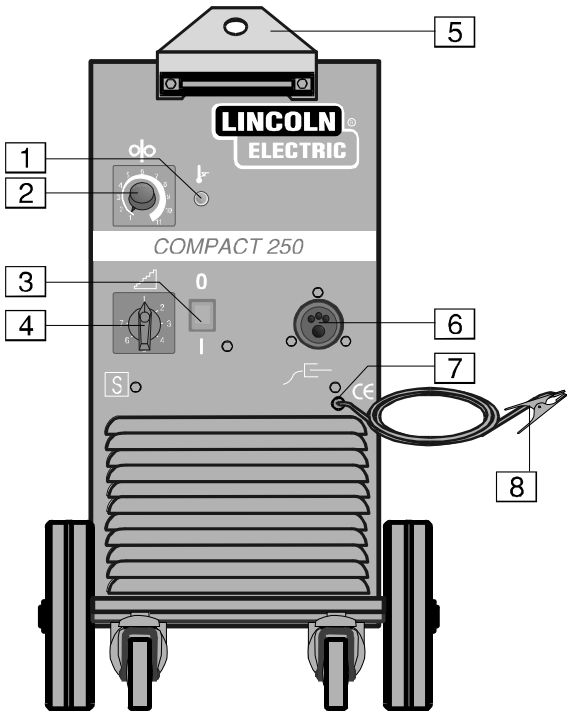
For shielding gas supplaying you should :

- Chain as cylinder to ruuning gear, wall, or other stationary support so cylinder cannot fall and break off vave.
- Take off the hub cap o safety valve of the shielding gas cylinder and open it for a moment to remove potential impurities.
- Install the regulator on the gas cylinder.
- Connect the gas hose of the semi-automativ welder to the regulator.
- If it is necessary to connect the power supply of gas heater to the socket.
- Close the cylinder valve when not in use.

PREPARATION FOR WELDING

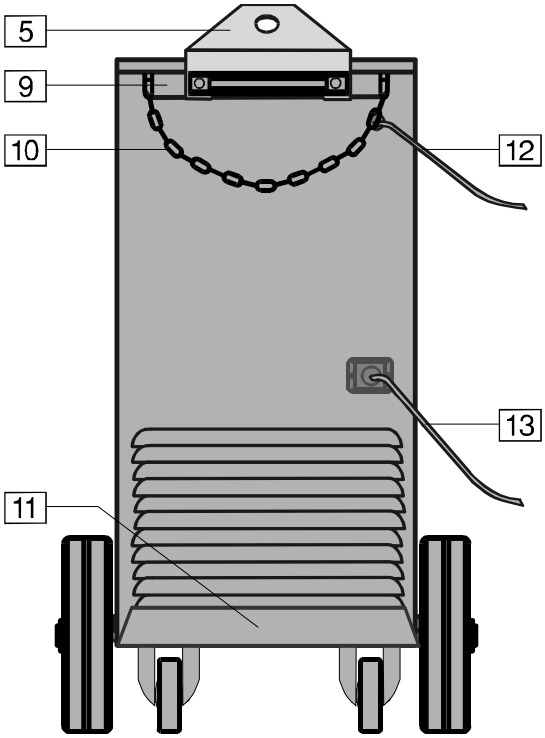
- Insert the plug of the return welding cable into the socket and connect its other end to the welded piece by means of the work clamp.
- Insert plug of the welding torch into the socket.
- Connect the shielding gas cylinder to the welder with the gas hose.
- Insert the mains cable plug of the welding machine to the mains socket.
- Install MIG wire into the wire feeder.
- Switch the welder on – the power indicator lights on and the fan switches on.
- Choose suitable settings of welding parameters according to the selected mode and thickness of welding pieces.
- Select the range of the welding voltage by means of the welding voltage switch.
- Adjust the welding current by means of the knob of the MIG wire feed speed control.
- Obeying the appropriate rules you can begin to weld.

OPERATING CONTROLS



1 Thermal Overload Indicator
2 Wire Feed Speed Control
3 Power on/off Switch
4 Welding Voltage Switch
5 Lifting Hook
6 Euro Gun Connection Socket
7 Return Welding Cable Socket
8 Welding Clamp Attachment

REAR PANEL



9 Gas Cylinder Bracket
10 Gas Cylinder Protecting Chain
11 Gas Cylinder Shelf
12 Hose for Gas Supplying

WELDING MODE

- The MIG/MAG welding method requires adjusting only two parameters : welding voltage and MIG wire speed.
- Welding current level is depended only on MIG wire speed and it should be matched for thickness of welded pieces.

CONTINUOUS WELDING

- For joining metal elements and metal sheets at point of contact.
- Switch the welder on – the lamp lights and fan switches on.
- Set the required welding voltage with the switch.
- Set the required MIG wire speed with the control.
- Select the desired welding torch mode with the switch.
- Start the welding process by pressing of the button on the welding torch.

WELDING PARAMETERS

- The MIG/MAG welding method requires adjusting only two parameters : welding voltage and MIG wire speed.
- Increasing the MIG wire feed speed causes shortening the arc length, increasing the welding current and increasing the depth of filling up.
- Decreasing the MIG wirefeed speed causes lenghtening of the arc length, dereasing the welding current and decreasing depth of filling up.
- Increasing the welding voltage causes lengthening of the arc length.
- Decreasing the welding voltage causes shortening of the arc length.
- Too high MIG wire feed speed causes 'pushing up' of the torch. The MIG wire falls behind to melt into the arc and pushes back the torch.
- Too low the MIG wire feed speed or too high welding voltage creates big drops of melted metal on the end of the wire, which fall down into the molten pool.
- To big splashes show that the welding voltage is too low or the MIG wire feed speed is too high.
- You may educe he welding voltage about 1-2V during 'from up to down' welding.
- You may increase the welding voltage about 1- 4V during making filling welding seams.

Electromagnetic Compatibility (EMC)

02/02

This machine has been designed in accordance with all relative directives and norms. However, it may still generate electromagnetic disturbances that can affect other systems like telecommunications (telephone, radio, and television) or other safety systems. These disturbances can cause safety problems in the affected systems. Read and understand this section to eliminate or reduce the amount of electromagnetic disturbance generated by this machine.

This machine has been designed to operate in an industrial area. To operate in a domestic area it is necessary to observe particular precautions to eliminate possible electromagnetic disturbances. The operator must install and operate this equipment as described in this manual. If any electromagnetic disturbances are detected the operator must put in place corrective actions to eliminate these disturbances with, if necessary, assistance from Lincoln Electric.

Before installing the machine, the operator must check the work area for any devices that may malfunction because of electromagnetic disturbances. Consider the following.

- Input and output cables, control cables, and telephone cables that are in or adjacent to the work area and the machine.
- Radio and/or television transmitters and receivers. Computers or computer controlled equipment.
- Safety and control equipment for industrial processes. Equipment for calibration and measurement.
- Personal medical devices like pacemakers and hearing aids.
- Check the electromagnetic immunity for equipment operating in or near the work area. The operator must be sure that all equipment in the area is compatible. This may require additional protection measures.
- The dimensions of the work area to consider will depend on the construction of the area and other activities that are taking place.

Consider the following guidelines to reduce electromagnetic emissions from the machine.

- Connect the machine to the input supply according to this manual. If disturbances occur if may be necessary to take additional precautions such as filtering the input supply.
- The output cables should be kept as short as possible and should be positioned together. If possible connect the work piece to ground in order to reduce the electromagnetic emissions. The operator must check that connecting the work piece to ground does not cause problems or unsafe operating conditions for personnel and equipment.
- Shielding of cables in the work area can reduce electromagnetic emissions. This may be necessary for special applications.

Technical Specifications

INPUT				
Input Voltage 240 V ± 15% 1 phase	Maximum Input Current 45A	Rated Input Current / Maximum Power Consumption 45A / 10.8 kW @ 20% Duty Cycle 23A / 5.8kW @ 60% Duty Cycle 13A / 3.1kW @ 100% Duty Cycle	Power Factor cos j 0.92 (240A)	50 Hertz (Hz)

RATED OUTPUT AT 40°C			
Welding Current / Output Voltage 240A / 23.5V @ 20% Duty Cycle 160A / 20.0V @ 60% Duty Cycle 110A / 18.0V @ 100% Duty Cycle	Open Circuit Voltage Range 15 – 37 V	Welding Current Range 45 – 240 A	Number of Welding Voltage Steps 8

OUTPUT RANGE	
Insulation Class F	Degree of Protection IP 21

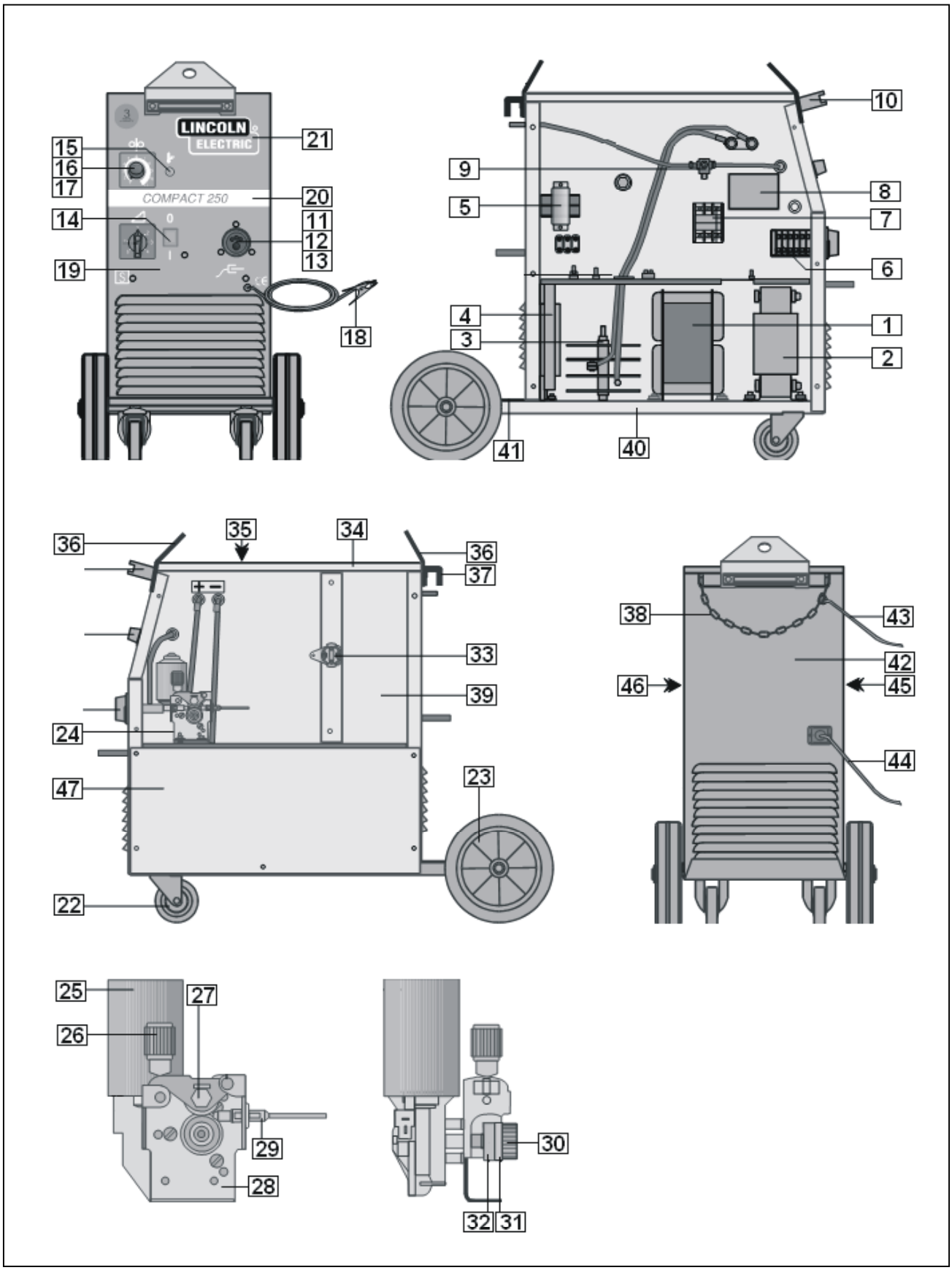
RECOMMENDED INPUT CABLE AND FUSE SIZES	
Fuse or Circuit Breaker Size 25 A Superlag	Input Power Cable 3 Conductor, 2.5 mm^2

WIRE FEEDER			
Wire Feeding Range u 1 – 17 m/min	Steel Wire (V-type rolls) 0.6 – 1.2 mm	Flux Cored Wire (VK-type rolls) 0.9 – 1.2 mm	Aluminium Wire (U-type rolls) 0.8 – 1.6 mm

PHYSICAL DIMENSIONS			
Height 740 mm	Width 430 mm	Length 850 mm	Weight 78 Kg
Operating Temperature –20°C to +40°C		Storage Temperature -25°C to +55°C	

For any maintenance or repair operations it is recommended to contact the nearest technical service center or Lincoln Electric. Maintenance or repairs performed by unauthorized service centers or personnel will null and void the manufacturers warranty.

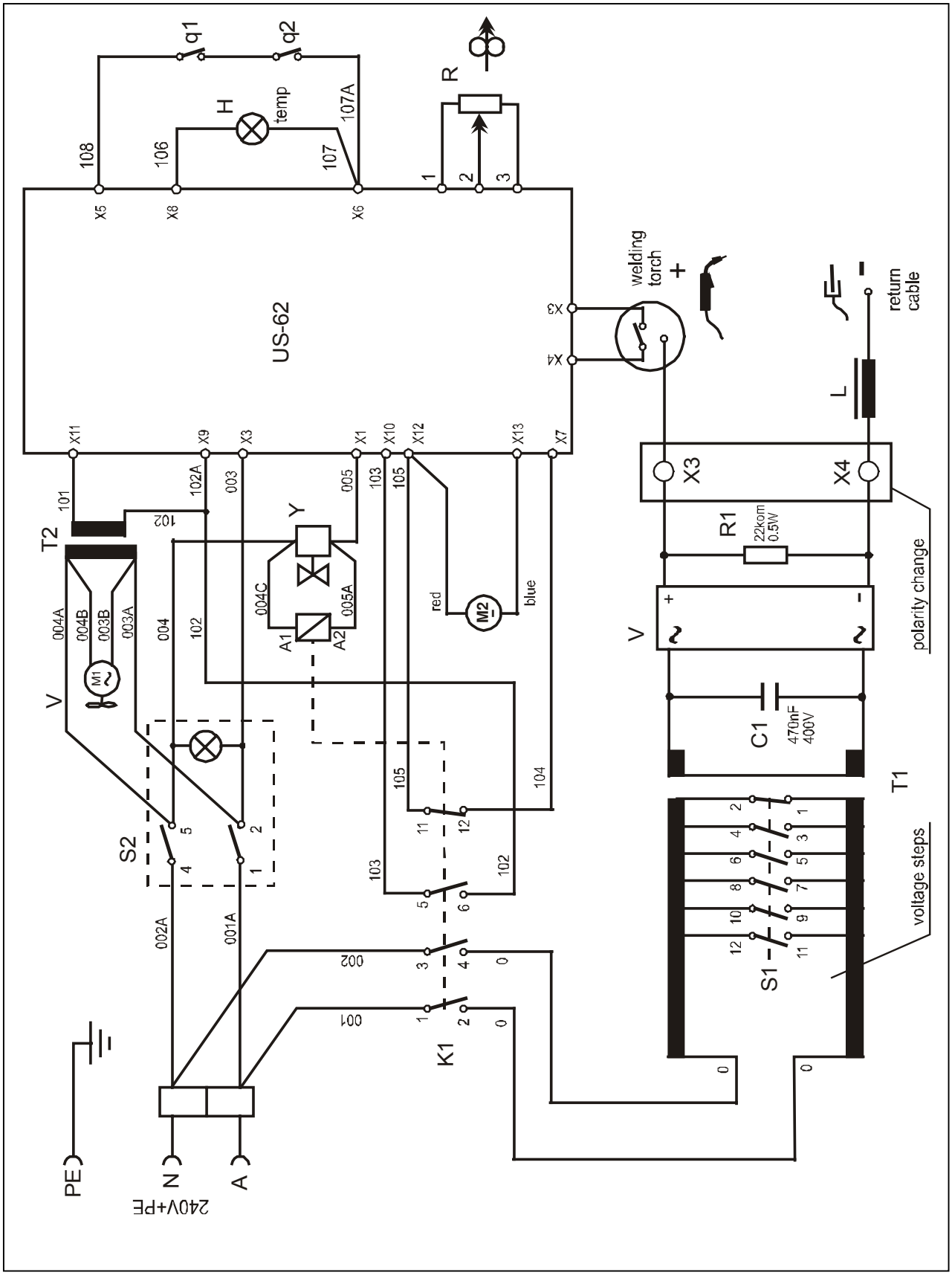
Spare Parts


LINCOLN
ELECTRIC
COMPACT 250
15
16
17
14
19
21
20
11
12
13
18
10
9
5
8
7
6
4
3
1
2
41
40
36
35
34
36
37
33
39
24
47
23
22
38
43
42
46
45
44
25
27
26
29
28
30
32
31

Spare Parts K: 14006-1; Code: 5009

Pos.	Description	Type	Part number	Qty
1	MAIN TRANSFORMER 250		C-4244-362-3R	1
2	CHOKE L 250		C-4244-367-3R	1
	TEMPERATURE SENSOR 160°C		1115-769-112R	1
3	RECTIFIER SET V 250		D-4639-044-3R	1
	TEMPERATURE SENSOR	CZOT AO2\96-103	1115-769-088R	1
4	FAN	MEZAXIAL 3141	0873-100-092R	1
5	AUXILIARY TRANSFORMER		C-4244-270-7R	1
6	SWITCH S1 250	ŁK 25R/4.881	1115-260-132R	1
7	CONTACTOR K 220/250	CI 25 220-240V 50Hz	1115-212-223R	1
	AUXILIARY CONTACT	CB-NC	1115-212-206R	1
8	CONTROL CIRCIUT BOARD	US-62	0918-432-067R	1
9	GAS VALVE	ELRA 5536 230V	0972-423-004R	1
10	HANDLE	C-2687-008-1	1361-599-600R	1
11	EURO SOCKET (complete)		C-2985-005-6R	1
12	EURO COVER		B10973-1	1
13	EURO SOCKET (outlet guide)		D-1829-066-1R	1
14	MAIN SWITCH	W4.1.8 GREEN O/I	1115-270-005R	1
15	LAMP H1	LS3-N1	0917-421-043R	1
16	POTENTIOMETERS	PR246-10KOHM	1158-113-304R	1
17	KNOB		1158-910-025R	1
18	RETURN CABLE		D-5578-159-1R	1
19	FRONT PANEL with STICKERS		D-3721-343-3R	1
20	STICKER		2719-107-349R	1
21	STICKER		2719-107-437R	1
22	TURNING WHEEL	SCP 80	1029-660-080R	2
23	WHEEL	FI 200	1029-660-200R	2
24	FEEDING UNIT (complete)		B-6713-009-1R	1
25	MOTOR KSV 4030/266		1111-722-044R	1
26	FIXING ARM		D-2535-012-1R	1
27	PRESSURE ARM		D-4732-001-1R	1
28	FEED PLATE		C-2774-081-1R	1
29	INLET GUIDE		1361-599-397R	1
30	CAP		1361-599-686R	1
31	MOUNT RING		1361-599-364R	1
32	ROLL V 0.6/0.8/1.0/1.2	C-2481-007-1	BP10084-1	1
	ROLL VK0.9/1.2*	D-2481-048-1	BP10138-1	1
	ROLL U 0.8/1.0/1.2/1.6*	C-2481-007-2	BP10115-1	1
33	SLEEVE		C-3891-001-1R	1
34	TOP PANEL		D-3773-019-2/08R	1
35	RUBBER MAT for TOP PANEL		D-2732-096-8R	1
36	LIFTING LUG		D-2687-152-1R	2
37	CHAIN SUPPORT		C-2631-242-2/08R	1
38	CHAIN		0652-410-003R	1
39	DIVIDER PANEL		D-3721-377-2/08R	1
40	BOTTOM PANEL		D-3774-029-1/08R	1
41	RUBBER MAT for CYLINDER TRAY		D-2732-096-2R	1
42	REAR PANEL		C-3721-783-1/08R	1
43	GAS HOSE	5x2	1361-410-005R	2,5m
44	MAIN CABLE		D-5578-158-2R	1
45	LEFT SIDE PANEL wirh STICKER		D-2721-966-2R	1
	STICKER		2719-107-234R	1
46	RIGHT SIDE PANEL with STICKER		D-2721-965-3R	1
	STICKER		2719-107-234R	1
47	SIDE PANEL LOWER		D-3721-395-2/02R	1
48	HARNESS (complete)	NOT SHOW	B-7639-420-1R	1

Electrical Schematic



Accessories

	Ground Cable with the Work Clamp 3m
	Mains Cable without Plug
	Gas Hose 2m
	MIG Gun with Blue Handle Type MB 25 (Binzel)
	Chain to Secure Gas Cylinder 0.7m
BP10084-1	V-type Roll 0.6 / 0.8 / 1.0 / 1.2 F30

MANUAL REVISIONS

DO NOT PRINT THIS PAGE IN THE MANUAL.

REV 1:

- Incidate all changes here.