I-207-538-1
10/2023
REV05

Magster 380, 450, 450W

OPERATOR'S MANUAL

ENGLISH

bester®
by Lincoln Electric

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

- Please Examine Package and Equipment in case of 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

Technical Specifications

NAME			INDEX	
MAGSTER 380			**B18223-2**	
MAGSTER 450			**B18224-1**	
MAGSTER 450			**B18224-2**	
MAGSTER 450W			**B18225-4**	
INPUT				
	Input Voltage U_1[V]		Input Amperes I_{1max}[A]	
380	400V ± 10% 3-phase		25	
450			32	
450W			32	
	Input Power [kVA]		Power Factor cosφ	Frequency
380	17,3		0,96	50 / 60 Hz
450	21,5			
450W	21,8			
RATED OUTPUT				
	Process	Duty Cycle 40°C (based on a 10 min. period)	Output Current	Output Voltage
380	MIG	35%	360A	32,0V
		60%	295A	29,0V
		100%	225A	25,5V
	Proces	Duty Cycle 40°C (based on a 10 min. period)	Output Current	Output Voltage
450	MIG	40%	420A	35,0V
		60%	345A	31,5V
		100%	265A	27,5V
	Proces	Duty Cycle 40°C (based on a 10 min. period)	Output Current	Output Voltage
450W	MIG	40%	420A	35,0V
		60%	345A	31,5V
		100%	265A	27,5V
WELDING CURRENT RANGE				
	Process	Open Circuit Voltage U_0	Welding Current Range	Welding Voltage Range
380	MIG	18 ÷ 48,0V	40A÷360A	16,0V÷32,0V
450		18 ÷ 51,0V	40A÷420A	16,0V÷35,0V
450W		18 ÷ 51,0V	40A÷420A	16,0V÷35,0V
RECOMMENDED INPUT CABLE AND FUSE SIZES				
	Fuse or Circuit Breaker Size		Input Power Cable	
380	25A Super Lag		4 x 2,5mm^2	
450	32 A Super Lag		4 x 2,5mm^2	
450W	32 A Super Lag		4 x 2,5mm^2	

PHYSICAL DIMENSIONS				
	Length	Width	Height	Weight (Net)
380	910mm	450mm	1010 mm	145 kg
450				154 kg
450W				161 kg

COOLING SYSTEM PARAMETERS & COOLANT		
	Rated Cooling Power (V=1l/min) [kW]	Maximum Liquid Pressure [MPa]
450W	1,2	0,32

450W	Recommended coolant	FREEZCOOL - W000010167
450W	Do not use!!	Pre-packaged welding industry coolants. These coolants may contain oil-based substances, which attack the plastic components of the cooler. Once added to the cooler, these substances are impossible to purge from the water lines and heat exchanger.
		Automotive anti-freeze. These coolants will damage the pump and block of the heat exchanger, affecting cooling performance.

Operating Temperature	Storage Temperature
-10°C to +40°C	-25°C to +55°C

ECO design information

The equipment has been designed in order to be compliant with the Directive 2009/125/EC and the Regulation 2019/1784/EU.

Efficiency and idle power consumption:

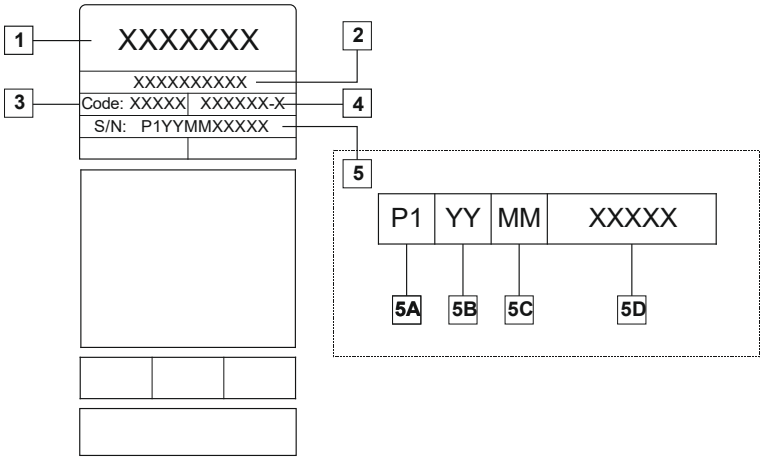
Index	Name	Efficiency when max power consumption / Idle power consumption	Equivalent model
B18225-4	**MAGSTER 450W**	66,2% / 300W	No equivalent model

Idle state occurs under the condition specified in below table

IDLE STATE	
Condition	**Presence**
MIG mode	
TIG mode	
STICK mode	
After 30 minutes of non-working	X
Fan off	

The value of efficiency and consumption in idle state have been measured by method and conditions defined in the product standard EN 60974-1:20XX.

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 comonnly 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.

End of life

At end of life of product, it has to be disposal for recycling in accordance with Directive 2012/19/EU (WEEE), information about the dismantling of product and Critical Raw Material (CRM) present in the product, can be found at https://www.lincolnelectric.com/en-gb/support/Pages/operator-manuals-eu.aspx

Electromagnetic Compatibility (EMC)

11/04

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

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

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

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

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

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

WARNING

The Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.

WARNING

This equipment does not comply with IEC 61000-3-12. If it is connected to a public low-voltage system, it is responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment may be connected.

Safety

11/04

WARNING

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

	WARNING: This symbol indicates that instructions must be followed to avoid serious personal injury, loss of life, or damage to this equipment. Protect yourself and others from possible serious injury or death.
	READ AND UNDERSTAND INSTRUCTIONS: Read and understand this manual before operating this equipment. Arc welding can be hazardous. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment.
	ELECTRIC SHOCK CAN KILL: Welding equipment generates high voltages. Do not touch the electrode, work clamp, or connected work pieces when this equipment is on. Insulate yourself from the electrode, work clamp and connected work pieces.
	ELECTRICALLY POWERED EQUIPMENT: Turn off input power using the disconnect switch at the fuse box before working on this equipment. Ground this equipment in accordance with local electrical regulations.
	ELECTRICALLY POWERED EQUIPMENT: Regularly inspect the input, electrode, and work clamp cables. If any insulation damage exists replace the cable immediately. Do not place the electrode holder directly on the welding table or any other surface in contact with the work clamp to avoid the risk of accidental arc ignition.
	ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS: Electric current flowing through any conductor creates electric and magnetic fields (EMF). EMF fields may interfere with some pacemakers and welders having a pacemaker shall consult their physician before operating this equipment.
	CE COMPLIANCE: This equipment complies with the European Community Directives.
	ARTIFICIAL OPTICAL RADIATION: According with the requirements in 2006/25/EC Directive and EN 12198 Standard, the equipment is a category 2. It makes mandatory the adoption of Personal Protective Equipment (PPE) having filter with a protection degree up to a maximum of 15, as required by EN169 Standard.
	FUMES AND GASES CAN BE DANGEROUS: Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. To avoid these dangers the operator must use enough ventilation or exhaust to keep fumes and gases away from the breathing zone.
	ARC RAYS CAN BURN: Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing. Use suitable clothing made from durable flame-resistant material to protect you skin and that of your helpers. Protect other nearby personnel with suitable, non-flammable screening and warn them not to watch the arc nor expose themselves to the arc.

	WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION: Remove fire hazards from the welding area and have a fire extinguisher readily available. Welding sparks and hot materials from the welding process can easily go through small cracks and openings to adjacent areas. Do not weld on any tanks, drums, containers, or material until the proper steps have been taken to insure that no flammable or toxic vapors will be present. Never operate this equipment when flammable gases, vapors or liquid combustibles are present.
	WELDED MATERIALS CAN BURN: Welding generates a large amount of heat. Hot surfaces and materials in work area can cause serious burns. Use gloves and pliers when touching or moving materials in the work area.
	CYLINDER MAY EXPLODE IF DAMAGED: Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. Always keep cylinders in an upright position securely chained to a fixed support. Do not move or transport gas cylinders with the protection cap removed. Do not allow the electrode, electrode holder, work clamp or any other electrically live part to touch a gas cylinder. Gas cylinders must be located away from areas where they may be subjected to physical damage or the welding process including sparks and heat sources.
	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.
	SAFETY MARK: This equipment is suitable for supplying power for welding operations carried out in an environment with increased hazard of electric shock.

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

Installation and Operator Instructions

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

Location and Environment

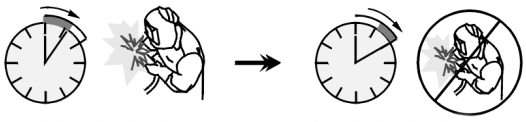
This machine will operate in harsh environments. However, it is important that simple preventative measures are followed to assure long life and reliable operation.

- Do not place or operate this machine on a surface with an incline greater than 10° 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 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.

Duty cycle and Overheating

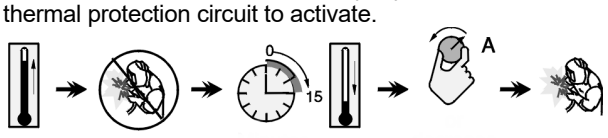
The duty cycle of a welding machine is the percentage of time in a 10 minute cycle at which the welder can operate the machine at rated welding current.

Example: 60% duty cycle



Welding for 6 minutes. Break for 4 minutes.

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



Minutes or decrease duty cycle

Input Supply Connection

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.

Installation and mains outlet socket shall be made and protected according to appropriate rules. Check the input voltage, phase, and frequency supplied to this machine before turning it on. For more information about input supply refer to the technical specification section of this manual and to the rating plate of the machine. Verify the connection of grounding wires from the machine to the input source.

WARNING

Equipment shall only be used on a supply system that is a three-phase, four-wire system with an earthed neutral.

Power Source Placement

WARNING

Avoid excessive dust, acid and corrosive materials in the air.

Keep protected from rain and direct sun when in use outdoors.

There should be 500 mm space about for the welding machine to have good ventilation.

Use adequate ventilation when in confined areas.

Wire Feeder Connection

To connect the wire feeder to the power source Magster 380 or 450 you should use the combined cable (see chapter “Accessories”) and do the following:

- Connect the combined cable to the socket marked by [+].
- Connect the control cable to the socket marked by [↗]

To connect the wire feeder to the semi power source Magster 450W you should use the combined cable (see chapter “Accessories”) and do the following:

- Connect the combined cable to the socket marked by [+].
- Connect the control cable to the socket marked by [↗].
- Disconnect the hose, which closes the circuit of the water cooling system and connect hoses to the welding source and wire feeder according to colour marks (the blue hose to the socket with blue bordering).

Wire diagram of the welding source and wire feeder is shown in the chapter “Wiring Diagrams”.

Ground Cable Connecting

Connect the ground cable to one of the two sockets [−], additionally marked by:

- ⌒⌒⌒ : high inductance output socket.
- ⌒ : low inductance output socket.

Controls and Operational Features

FRONT PANEL

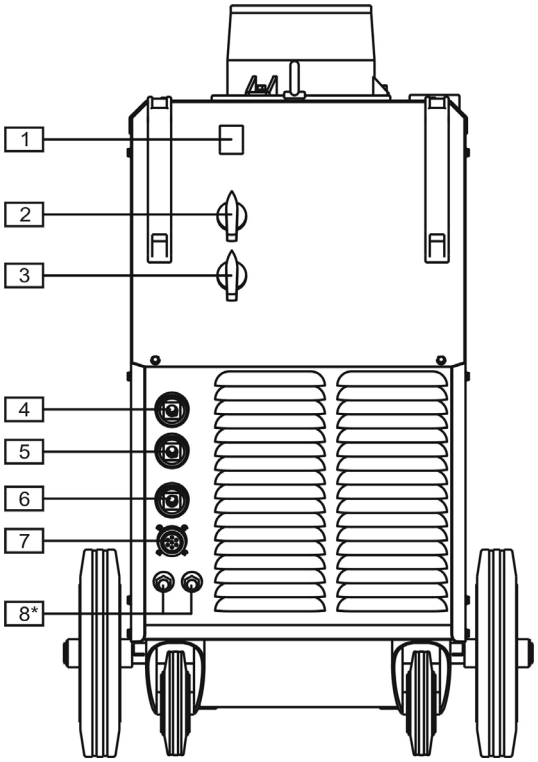


Figure 1

1. Power Switch: Turns the machine on/off. Switching on is indicated by lighting up of the switch button.
2. Welding Voltage Changing Switch: 3-step switch enables welding voltage step selection.

⚠ WARNING

It is not allowed changing the welding voltage range during welding process. It may damage the switch.

3. Welding Voltage Changing Switch: 10-step switch enables welding voltage step selection.

⚠ UWAGA

It is not allowed changing the welding voltage range during welding process. It may damage the switch.

4. Output Socket with High Inductance: For connecting the ground cable. The high inductance connection is more suitable for short arc welding in heavier work or when using mix Ar+CO2 shielding gas.
5. Output Socket with Low Inductance: For connecting the ground cable. The low inductance connection is typically used for short arc welding of mild steel, particularly on thin materials or when using CO2 shielding gas.
6. Positive Output Socket: For connecting the welding cable to the wire feeder.
7. Control Socket: 7-pin socket for connecting the control cable to control the welding source and to supply the wire feeder from the welding source.
8. Quick Water Connector the Cooling System(450W ONLY): For connecting hoses of the water cooling system.

REAR PANEL

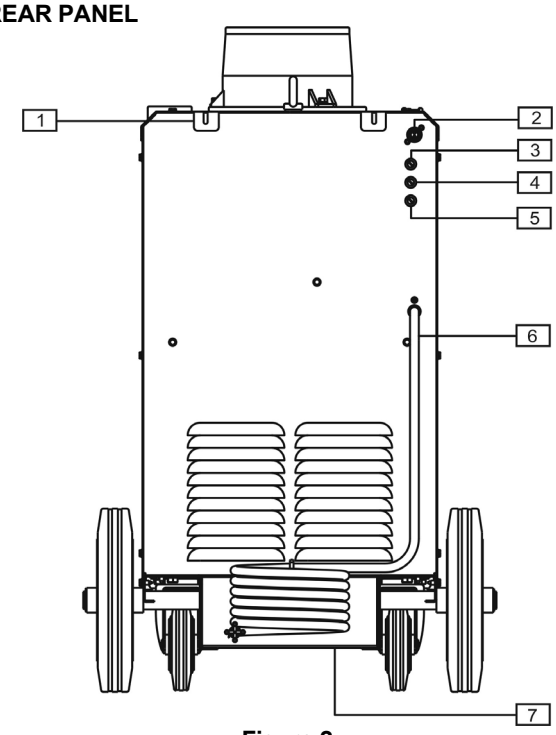


Figure 2

1. Bracket for fastening the gas cylinder.

⚠ UWAGA

After installation, protect the shielding gas cylinder from overturn with the chain.

2. Gas Heater Socket: Usup = 24VAC, Pmax = 80W.Fuse
3. Socket F3: The recommended fuse: 4A/400V (6,3x32mm).

⚠ WARNING

You have to use fuses with technical specifications given by the producer.

4. Fuse Socket F2: The recommended fuse: 6,3A/400V (6,3x32mm).

⚠ UWAGA

You have to use fuses with technical specifications given by the producer.

5. Fuse Socket F1: The recommended fuse: 3A/400V (6,3x32mm).

⚠ UWAGA

You have to use fuses with technical specifications given by the producer.

6. Power Input Cable.
7. Gas Cylinder Mount.

Water Cooling System (Magster 450W only)

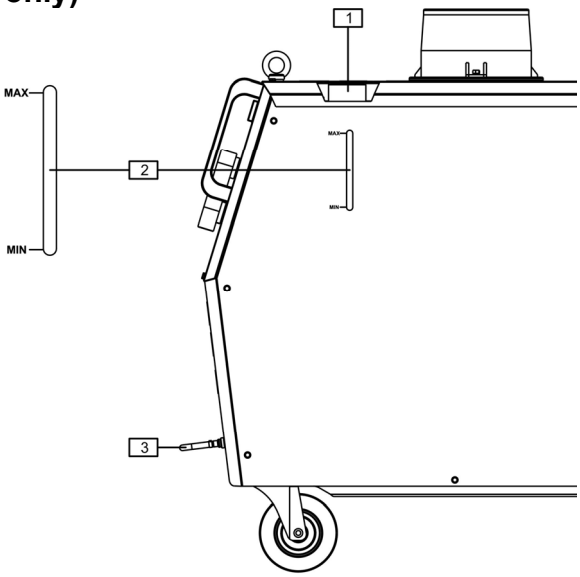


Figure 3

1. Reservoir Filler:

WARNING

You have to use coolant with technical specifications given by the producer. Do not add water and other cooling medium to the coolant.
Do not use automotive anti-freeze that contains rust inhibitors or leak stoppers.
Do not use pre-packaged welding industry coolants. These coolants may contain oil-based substances, which attack the plastic components of the cooling system.

2. Coolant Level Checking Window: The maximum coolant level is indicated by the MAX marker, the minimum level is indicated by the MIN marker.

WARNING

Do not operate machine without coolant in reservoir. Never run pump dry.

3. Cooling System Looping Hose:

WARNING

You have to connect cooling system looping hose when you use gas cooled welding gun. Otherwise it may damage cooling system pump.

Shielding Gas Connection

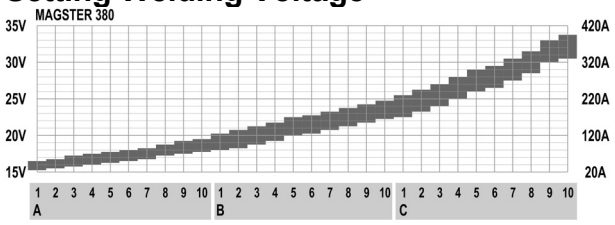
To connect shielding gas you should do the following:

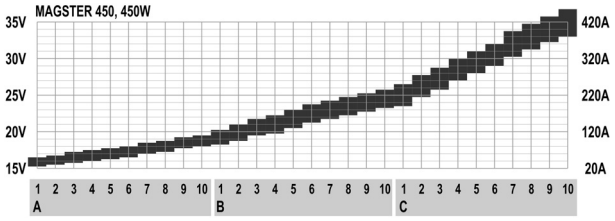
- After placing the gas cylinder on the gas cylinder mount, protect it from overturn with the chain.
- Take off the cap over the safety valve of the shielding gas cylinder.
- Install the gas regulator on the gas cylinder.
- Connect the shielding gas cylinder to the wire feeder with the gas hose of the combined cable, using clamping band.
- Welding with CO_2 as shielding gas, you should use the gas heater which Shielding Gas Connection.

Final Actions

- Connect the ground cable to the work piece with the work clamp.
- Connect the shielding gas cylinder to the shielding gas input through the gas regulator.
- Insert the plug of the power input cable of the welder into the mains socket.
- Switch on the power source with the power switch. It is indicated by lighting up of the switch button.
- Based on the seam kind, join type and material thickness of the work piece, chose correct welding settings with the welding voltage switch and wire feeder controls.
- Obeying the appropriate rules, begin to weld.

Setting Welding Voltage





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

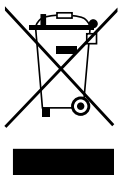
The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information 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.

WEEE

07/06



Do not dispose of electrical equipment together with normal waste!
In observance of European Directive 2012/19/EC on Waste Electrical and Electronic Equipment (WEEE) and its implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and returned to an environmentally compatible recycling facility. As the owner of the equipment, you should get information on approved collection systems from our local representative.
By applying this European Directive you will protect the environment and human health!

Spare Parts

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Part List reading instructions

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

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

Authorized Service Shops Location

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- 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 Suggested

B10357-1	Verbindungskabel PZ-380-450-5M (Magster 380 &450)
B10357-2	Verbindungskabel PZ-380-450-10M (Magster 380 &450)
B10357-3	Verbindungskabel PZ-380-450-15M (Magster 380 &450)
B10357-4	Verbindungskabel PZ-380-450-20M(Magster 380 &450)
B10356-1	Verbindungskabel PZW-380-450-5M (Magster 450W)
B10356-2	Verbindungskabel PZW-380-450-10M (Magster 450W)
B10356-3	Verbindungskabel PZW-380-450-15M (Magster 450W)
B10356-4	Verbindungskabel PZW-380-450-20M (Magster 450W)
W000010167	FREEZCOOL (KÜHLMITTEL) (Magster 450W)