

INSTRUCTION MANUAL FOR STICK WELDING MACHINE

IMPORTANT SAFETY INFORMATION!!!

READ THE FOLLOWING INSTRUCTIONS CAREFULLY BEFORE INSTALLATION, USE, OR SERVICING OF THIS UNIT. PAY CLOSE ATTENTION TO THE SAFETY RULES AND CONTACT YOUR DISTRIBUTOR IF YOU DO NOT UNDERSTAND SOME OR ALL OF THE POINTS COVERED IN THESE INSTRUCTIONS.

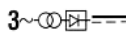



1 GENERAL INFORMATION

This manual has been prepared with the intent of instructing the operator on how to install, operate, and properly maintain this electric arc welding machine. This machine is a constant current power source which can weld coated electrodes and scratch start TIG weld.

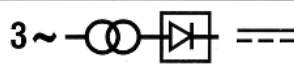
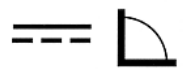
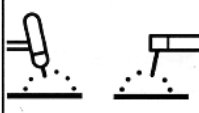


This welding machine must be used only for the purposes described in the instruction manual. Upon receiving and unpacking the machine, make a careful inspection to ensure that there are no damaged parts. Should there be a claim for losses or damages it must be made by the purchaser directly to the shipper who handled the goods.

When requesting information about this welding machine please state the machine's part number and serial number to ensure receiving accurate information relating to your machine.

1.1 DESCRIPTION OF TECHNICAL SPECIFICATIONS

IEC 974.1	This machine is manufactured according to these international standards.
EN 60974.1	Machine Serial Number which must appear on requests or inquiries relating to the machine.
N°.	
	Three-phase transformer-rectifier.
	Drooping characteristic.
	Shielded Metal Arc Welding. (Stick Welding)
U ₀ . PEAK	Secondary no-load voltage. Peak value.
X.	Duty-Cycle Percentage. The duty-cycle is the number of minutes, expressed as a percentage, the machine can operate (arc on) within a ten minute period without overheating. The duty cycle varies according to the output current.
I ₂ .	Output welding current.
U ₂ .	Secondary voltage, welding current = I ₂ .
U ₁ .	Nominal supply voltage.
3~ 50(60)Hz	Three-phase input supply at 50 or 60 Hz.
I ₁ .	Input Amps absorbed corresponding to different output levels (I ₂).
IP21.	Machine case protection class. The 1 in the singles digit place means that this unit is not fit to work outdoors in the rain.
	Fit to work in hazardous areas.

NOTE: This machine has also been designed to work in class 3 pollution areas (see IEC 664).

		Nº			
		EN 60974-1			
		A / V - A / V			
		U ₀			
		V ÷ V			
		PEAK			
		X	%	%	%
		I ₂	A	A	A
		U ₂	V	V	V
 					
3~ 50 Hz	U ₁	V V	I ₁	A A	A A
IP 21		CL. H		<div>S</div> <div>VENTILAZIONE FORZATA FORCED VENTILATION VENTILE KUHLLART F VENTILACION FORZADA</div>	

2 INSTALLATION

2.1 SETUP

All connections must be made in compliance with current regulations and in full respect of safety laws (see CENELEC HD 427 standard).

Assemble the parts supplied with the welding machine. Remove the machine from its pallet following the instructions. To lift the machine use the two upper eyebolts, placing the ropes as shown in fig. 1. The handles A (fig. 1) must not be used for lifting.

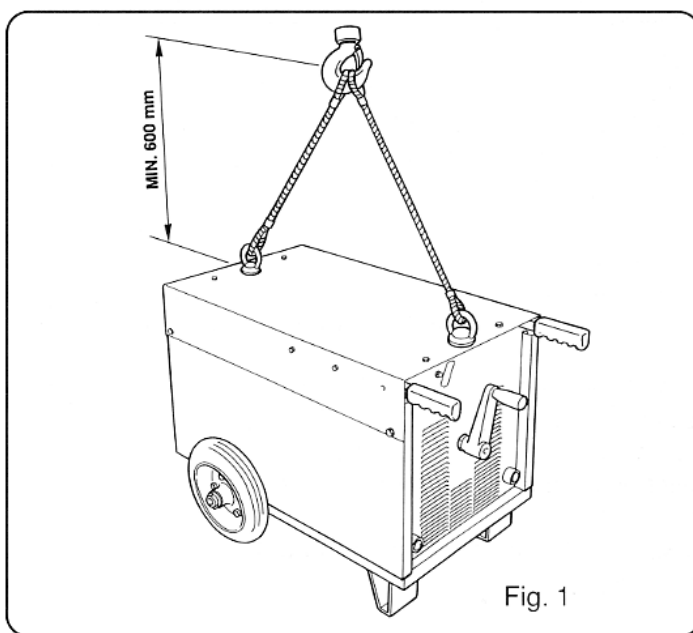


Fig. 1

2.2 INPUT CONNECTIONS

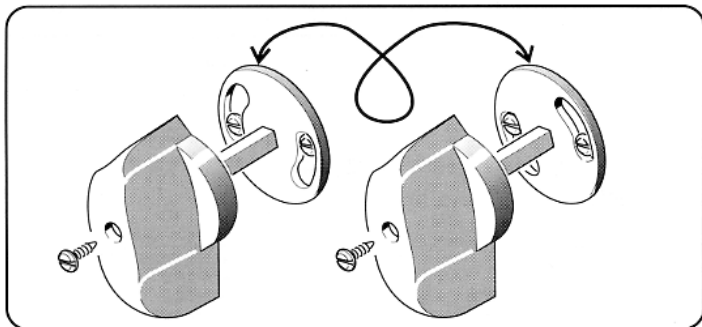
- Connect the yellow-green wire to a good electrical ground.

- Never use water pipes as ground conductors.

After final inspection, the welding machine should be connected to the maximum power supply voltage indicated on the front panel.

If you wish to change the power supply voltage:

- Set the selector switch knob to the zero position (machine off)
- Remove the selector switch knob by unscrewing the holding screw; beneath you will find the voltage change disk
- Position it so that the selector switch may turn only towards the desired voltage indicated on the panel
- Insert the knob and fasten it in place with the screw.



Connect supply cable: the yellow-green wire of cable must be connected to an efficient earth point of the system, the remaining wires should be connected to the feed line through an isolation switch placed, if possible, close to the working area so as to switch the unit off quickly if necessary.

The magnetothermic switch capacity or of fuses in series with switch should be equal or above the current I_1 absorbed by the unit. Current I_1 absorbed is known by reading the technical specifications on the unit i.e. feed voltage U_1 available. Any extensions should have adequate sections for current absorbed I_1 .

2.3 OUTPUT CONNECTIONS

2.3.1. Connecting the electrode holder.

- The electrode holder must be connected to the machine in compliance with the polarity indicated on the box of electrodes that you are going to use. When you connect the electrode holder cable and the earth cable, make sure that the power cable terminals are well tightened.
- The jaws of the electrode holder must be kept tightened and the surfaces must be kept in good condition to ensure good contact with the electrode rod.
- Defective jaws will allow the electrodes to move which will make welding difficult.
- The connection between the electrode holder cable and the electrode holder must be well tightened.
- Use well insulated electrode holders.
- Never touch the electrode holders of two different welding machines at the same time.
- Always avoid contact between parts of the body and the electrode holder and/or the electrode.

2.3.2 Connecting the Earth Clamp

- Make sure that the earth clamp makes good contact with the workpiece.
- Check that the earth cable is tightly fitted to the earth clamp; periodically check to make sure that this connection remains well tightened.

A poorly tightened connection can cause current drops

during welding and also cause overheating of the earth clamp and cable which can create the danger of burns.

- The weld circuit must not be purposefully placed in direct or indirect contact with the protection lead if not in the workpiece.
- If the workpiece is intentionally connected to the system earth by means of a protection lead, the connection has to be as direct as possible and done with a lead that has a cross section at least equal to that of the welding current return cable. The lead must also be connected to the workpiece at the same point as the return cable. A second earth clamp, placed in the immediate vicinity, can also be used.

2.3.3 Choosing the right welding cables

- We recommend using the shortest possible welding cables type H01 N2-D or H01 N2-E, in compliance with CENELEC HD22.6 S1.
- Too much resistance in the welding cables can reduce the output available for the welding.
- The performance of any arc welding machine depends, generally, on the condition of the cables and the cable connections.

CROSS SECTIONS OF WELDING CABLES MEASURED IN mm^2

WELDING CURRENT IN AMPERES	DISTANCE FROM THE MACHINE IN METRES						
	15	20	30	40	45	50	60
100	35	35	35	50	50	50	50
150	35	35	50	50	70	70	90
200	35	50	50	70	70	95	100
250	35	50	70	70	95	100	150
300	50	70	70	95	100	150	150
350	50	70	95	100	150	150	200
400	50	95	95	150	150	200	210

NOTE: The cross sections listed in the table are those for each single conductor (electrode holder or ground clamp). The cross sections of the cables can be obtained by connecting in parallel 2 or 3 conductors having the same cross section. For example:

$150 \text{ mm}^2 = \text{three } 50 \text{ mm}^2 \text{ cables linked together in parallel.}$
 $200 \text{ mm}^2 = 2 \times 95 \text{ mm}^2 \text{ cables or } 3 \times 70 \text{ mm}^2 \text{ cables linked together in parallel.}$

2.3.4 Connecting two welding machines in parallel.

- Two welding machines can be connected in parallel so that one obtains an output current greater than the output current of each single machine.
- It is important that the positive pole of one machine is connected to the positive pole of the other machine and likewise that the negative pole of one machine is connected to the negative pole of the other machine.
- When making this connections it is important to abide by the cross sections shown in the table. After having connected two machines in parallel, set the output current of each machine to the halfway point so that each machine will produce half of its maximum output current. This is recommended in order to balance the heat produced by each machine, thus allowing the operator to make the best use of the duty cycles of both machines.

3 FRONT PANEL DESCRIPTION.

A - Main selector switch

Turns the machine on or off
The voltage change disk is located beneath the knob

B - Carrier handle housing

To extract the handles, simply pull the knobs outward.
When the handles reach their greatest extension you will hear the lock click into place; to re-insert them, pull the locking levers under the handles and push them inward at the same time.

C - Setting indicator

Indicates the welding current to which the machine is set.

D - Welding current adjustment knob

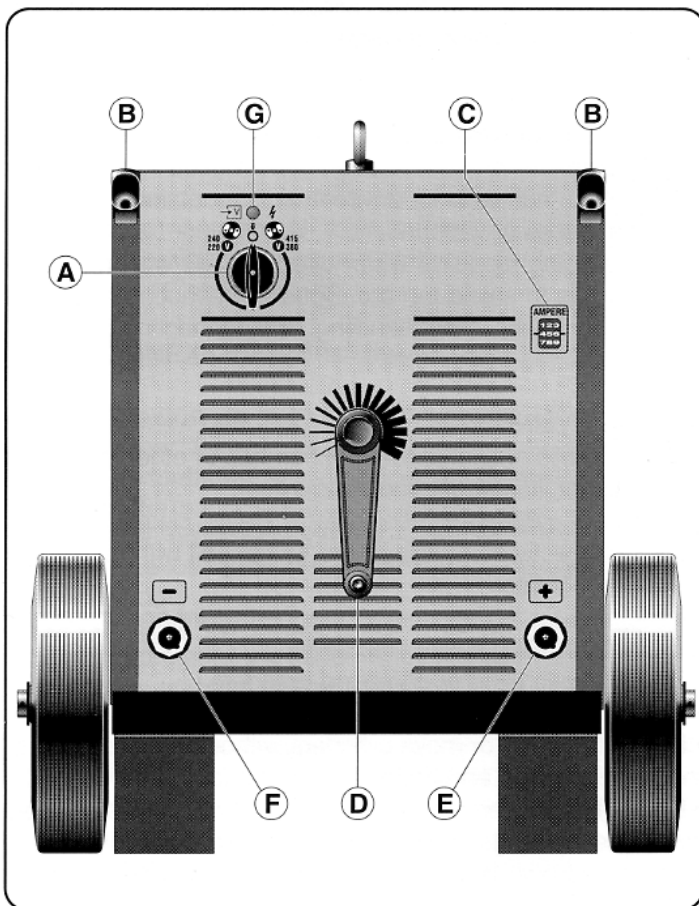
Turn this knob clockwise to increase the current intensity, or counter-clockwise to decrease.

E - Positive terminal

F - Negative terminal

G- On light

Indicates that the machine is running



Before using this welding machine, carefully read the regulations CENELEC HD 407 and CENELEC HD 433. Also make sure that the insulation on cables, torch and earth cable is intact.

Remember! Switch machine off when not in use.

4 MAINTENANCE

WARNING:

All servicing repair must be done by qualified personnel.

- Before opening the machine case to service or repair, turn the machine off and disconnect the plug from the power supply.
- Keep the welding cables, the electrode holder, and the earth clamp in good condition.
- Periodically clean inside the machine blowing dust and dirt away from internal components with a light jet of dry air.

5 TROUBLESHOOTING

1- TROUBLE - The machine does not turn on

- CAUSES
- Input power cord not plugged in.
 - One power supply phase missing.

2- TROUBLE- The machine switches on but does not supply current.

- CAUSES
- Welding accessories not connected.
 - Machine not connected to the right supply voltage.

3- TROUBLE- The line fuse blows.

- CAUSES
- Installed line power insufficient.
- Machine not connected to the right supply voltage.
Power transformer in short circuit.

4- TROUBLE- Welding current unstable or incorrect.

- CAUSES
- Primary or secondary connections incorrectly fitted.
 - Inadequate electrode.
 - Incorrect polarity.
 - Welding cables not properly tightened to the output terminals or false contacts in connections.
 - Machine not connected to the right supply voltage.

5- TROUBLE- The fan does not work but the output welding current is correct.

- CAUSES
- Defective fan motor.
 - Interruption in the leads that supply power to the fan motor.
 - Fan motor fuse blown.

6 SAFETY RULES CONCERNING THE USE OF THIS WELDING MACHINE

6.1 INTRODUCTION

All people authorized to use this machine should read the following instructions manual before using or servicing this unit.

A reminder: YOUR SAFETY DEPENDS ON YOU!!!

Always follow all safety regulations and instructions when using this machine. It is your responsibility to protect yourself and others against the risks related to the operation of this welding machine. The operator must be familiar with and observe all the safety rules regarding the safe operation and maintenance of this welding machine.

NOTHING REPLACES GOOD COMMON SENSE !!!

6.2 GENERAL PRECAUTIONS

6.2.1 Fire



- Avoid causing fires due to sparks, slag, hot metal and spatter which are produced during normal welding operations.

- Make sure that a suitable fire-extinguisher is located near the welding area.
- Remove all flammable material within 30 feet of the welding area.
- Do not weld containers (tanks or drums) containing flammable material, even when empty. These must be carefully cleaned before being welded.
- Allow the welded metal to cool down before touching it or putting it into contact with flammable material.
- Do not weld structures with hollow spaces containing flammable substances.
- Do not work in conditions where there are high concentrations of combustible vapours, gases, or flammable dust.
- Always check the work area half an hour after welding so as to make sure that no fire has started.
- Do not keep any flammable material such as lighters or matches in your pockets while using this equipment.
- The welding cables must not be used for current loads which exceed their rated capacity. If the cables draw current in excess of the rated capacity, overheating can occur which will cause the rapid deterioration of the insulation which covers the cables.
- Always ensure welding cables are adequately insulated.
- The connections between cables must be well tightened and properly insulated.
- Frequently inspect the cables and repair any cuts or tears that might be found.
- Keep all connections well tightened.

6.2.2 Burns

- Protect your entire body by wearing fire-proof clothing. This will protect your skin against burns caused by: ultra-violet radiation given off by the arc, sparks and molten slag.
- The protective clothing should include: gloves, a hat, and high shoes. Your shirt collar and pocket flaps should be buttoned, and cuff-less trousers should be worn to prevent contact with sparks and molten slag.
- Wear a helmet equipped with the appropriate lens shade and a clear glass cover plate. This is imperative when welding, cutting, and chipping to protect your eyes from ultra-violet arc rays and molten spatter. Replace the glass cover plate when cracked or covered with spatter etc.
- Do not wear clothing spotted with oil or grease as a spark may set them on fire.
- Hot metal, electrode stubs and workpieces, should never be handled without gloves.
- First-aid equipment and a qualified first-aid person should always be available when welding, unless medical facilities are in the immediate vicinity, to treat flash burns of the eyes and skin burns.
- Ear plugs should be worn when working in the overhead position or in confined spaces. A hard hat should be worn when others are working overhead.
- Flammable hair sprays and gels should not be used by those persons intending to weld.

6.2.3 Fumes



Welding operations produce harmful fumes and metal dusts which may be hazardous to your health, therefore:

- Work in well-ventilated areas.
 - Keep your head out of the fumes.
 - In closed areas, use a fume exhaust system, preferably placed under the welding area if possible.
 - If ventilation is inadequate, use an approved respirator set.
 - Clean the metal to be welded of any solvents or halogen degreasers which give rise to toxic gases. During some welding operations chlorine solvents may be decomposed by arc radiation thus creating phosgene gas.
 - Do not weld coated metals or those containing lead, graphite, cadmium, zinc, chrome, quicksilver, or mercury unless you have an approved respirator set.
 - The electric arc creates ozone. Long exposures to high ozone concentrations may cause headaches; nasal, throat and eye irritation; as well as congestion and chest pains.
- WARNING: NEVER USE OXYGEN FOR VENTILATION.**
- Gas leaks in confined spaces should be avoided. Leaked gas in large quantities can dangerously alter oxygen levels in the air surrounding the weld area. Do not place gas cylinders in confined spaces.
 - DO NOT WELD where solvent vapors can be drawn into the welding shield atmosphere or where arc rays can come into contact with even minute quantities of trichloroethylene or perchloroethylene.

6.2.4 Explosions



- Do not weld above or near containers under pressure.
- Do not weld in environments containing explosive dusts, gases or vapours.
- This welding machine when used for TIG welding uses ARGON gas to shield the arc. Special precautions must be taken when transporting, handling, and connecting gas cylinders.

A) GAS CYLINDERS

- Never deface or alter the name, number, or other markings on a cylinder. It is illegal and dangerous!
- Do not use cylinders whose contents are not clearly identified.
- Do not directly connect cylinder to the unit without using a pressure regulator.
- Handle and use pressure cylinders with care and in conformity with existing safety standards.
- Do not use leaking or damaged cylinders.
- Do not use cylinders which are not well secured.
- Do not transport or move cylinders without the protection of the installed valve and protective valve cap.
- Do not lift cylinders off the ground by: their valves or caps, by chains, by slings, or by magnets.
- Never try to mix gases in a cylinder.
- Never refill a cylinder!
- Never lubricate the cylinder valve with oil or grease.
- Never allow an electrode to touch a cylinder!
- Do not expose cylinders to excessive heat, sparks, molten slag or flames.
- Do not tamper with the cylinder valve.
- Do not try to loosen tight valves by means of a hammer, a wrench, or any other object.

B) PRESSURE REGULATORS

- Keep pressure regulators in good condition. Damaged regulators may cause damages or accidents. They should be repaired by skilled personnel only.
- Do not use regulators for gases other than those for which they were manufactured.
- Never use a leaking or damaged regulator.
- Never lubricate regulators with oil or grease.

C) HOSES

- Replace hoses which appear to be damaged.
- Keep hoses unwound in order to prevent kinks.
- Keep the excess hose neatly wound and out of the working area in order to avoid damage.
- Cylinder fittings should never be modified or exchanged.

6.2.5 Radiation



Ultra-violet radiation emitted by arc rays may damage your eyes and burn your skin. Therefore:

- Wear proper clothing and helmet.
- Do not use contact lenses!! The intense heat created by the arc may cause them to stick to the cornea.
- Use a mask or helmet equipped with lens shades that have a minimum DIN rating of 10
- Warn people in the area surrounding the welding site that you are going to be welding.

Remember: the arc may dazzle or damage the eyes. It is considered dangerous up to a distance of 15 meters (50 feet). Never look at an arc with the naked eye.

- Prepare the welding area so as to reduce the reflection and transmission of ultra-violet radiation: paint walls and exposed surfaces in black to reduce reflection, install shielding systems or curtains to reduce the transmission of ultra-violet rays.
- Replace protective lenses whenever damaged or broken.

6.2.6 Electric shock



Electric shocks are hazardous and potentially fatal!

- Do not touch live electrical parts.
- Insulate yourself from the workpiece and the ground by wearing insulated gloves and clothing.
- Keep garments (gloves, shoes, hats, clothing) and body dry.
- Do not work in humid or wet areas.
- If you are welding near a body of water take precautions to ensure that the machine cannot fall into the water.
- Avoid touching or holding the workpiece by hand.
- Should you work in a dangerous area or close to one, use all possible precautions.
- Stop welding immediately if you should feel even the slightest sensation of electric shock. Do not use the machine until the problem is identified and corrected.
- Often inspect the mains input cable.
- Disconnect the power input cable from the mains supply before replacing cables or before removing the unit covers.
- Do not use the unit without protection covers.
- Always replace any damaged parts with genuine Cebora spare parts.
- Never disconnect any of the unit's safety devices.
- Servicing of the machine must be done by qualified personnel who are aware of the risks involved with the high voltage levels necessary to make the machine operate.

- Turn the machine off when it is not in use.

6.2.7 Pacemaker

Magnetic fields created by the high currents in the weld circuit can affect pacemaker operation. Persons wearing electronic life support equipment (pacemakers) should consult their doctor before going near any arc welding, gouging, cutting, or spot welding equipment in operation.

6.2.8 Noise



These power sources alone do not produce noise levels exceeding 80 dB. The Welding process, however, may produce noise levels in excess of 80 dB in which case the machine take operator must take the necessary safety precautions as prescribed by the national take safety regulations.