160 DualArc AC Stick Welder

(Model #FLOW160DA000)

Operator's Manual and Parts List

Florida Power & Welding International, LLC

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www.flopower.com

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INTRODUCTION

Congratulations on the purchase of your FLOPOWER welder! The welding machine you now own is the result of careful research aimed at providing good quality and easy to use equipment.

The FLOPOWER 160 DualArc welder is a compact, lightweight unit that delvers 160 Amps of AC (alternated current) welding current. It is ideal for basic repairs and general purpose welding.

It is designed for use with 220V and 110V circuits, making it a versatile and low-cost choice.

Before attempting to use the welder, please make sure to read this manual carefully! Should you have any technical problems or questions regarding this unit, contact us by email at sales@flopower.com or by telephone at **(800) 535 1185** -- from outside the USA **+1 305 698 2220**.

DESCRIPTION AND SPECIFICATIONS

Process	Welding Current Range	Input	Rated Duty Cycle	Overload Protection	Included Accessories	Weight
Arc welder for use with coated electrodes (Shielded Metal Arc Welding - SMAW)	55-160Amp AC	110VAC or 220VAC, 1 Phase, 50Hz or 60Hz	160Amp at 10% 113Amp at 20% 86Amp at 35%	Automatic shutdown	Face shield Chipping hammer	47.7 lbs (21.5 kgs)

FLOPOWER LIMITED WARRANTY

FLOPOWER warrants to its original retail purchaser that this unit is is free of defects in material and workmanship at the time it is shipped by FLOPOWER.

Within **one year** after the date of purchase, FLOPOWER will repair or replace any warranted parts or components that fail due to defects in material or workmanship, determined at FLOPOWER's discretion through an inspection conducted by the technical staff of FLOPOWER or its authorized resellers or repair service providers.

The reseller where the unit was purchased must be notified within 30 days of such defect or failure, and transport costs will be borne by the reseller.

The limited warranty shall not apply to:

- Units that have been disassembled or otherwise tampered by non-authorized personnel.
- Equipment that has been improperly installed (for example not-grounded), improperly operated (for example through the selection of the incorrect Voltage level) or mishandled (for example dented).
- Equipment which has not had resonable and necessary maintenance and care, or that has been exposed to water, rain, excessive moisture or excessive heat.
- Signs of natural wear and tear.

SAFETY PRECAUTIONS

HEALTH HAZARDS:

Welding produces intense electric and magnetic emissions that may interfere with the proper functioning of cardiac pacemakers, hearing aids, or other electronic health equipment. If you use such devices, you should consult your medical health professional and the manufacturer of the health device before using the welder.

GASES AND FUMES:

Gases and fumes produced during welding can be dangerous and hazardous to your health.

- Do not breathe welding fumes directly or allow others near you to do so. Work in an area that is properly ventilated.
- Use an air-supplied respirator if ventilation is not adequate to remove all fumes and gases.
- The kinds of fumes and gases from the welding operation depend on the kind of metal being used, coatings on the metal, and the different processes. You must be very careful when welding any metals which may contain one or more of the following: Antimony, Chromium , Mercury, Beryllium, Arsenic, Cobalt, Nickel , Lead, Barium, Copper, Selenium, Silver, Cadmium, Manganese , Vanadium.
- Always read the Material Safety Data Sheets (MSDS) that should be supplied with the material you are welding. These MSDS's will give you the information regarding the type and amount of fumes and gases that may be dangerous to your health.
- For information on how to test for fumes and gases in your workplace, refer to the section on "REFERENCE PUBLICATIONS" at the end of this manual.
- Use smoke extraction equipment if necessary.
- Phosgene, a toxic gas, is generated from the vapors of chlorinated solvents and cleansers. Remove all sources of these vapors.
- This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Sec. 25249.5 et seq.)

ELECTRIC SHOCK:

Electric shock can injure or kill. Electricity used during welding can cause severe or fatal shock to the operator or others in the workplace.

- Never touch any parts that are electrically "live" or "hot." Wear dry welding gloves and protective clothing. Insulate yourself from the work piece or other parts of the welding circuit.
- Never store or operate the welding machine, its parts, the welding surface or electrode in a humid environment or near water sources. If the welder becomes wet for any reason, make absolutely sure that it is completely dry before using the welder.

- Replace or repair all worn or damaged parts.
- Disconnect the power source before performing any service or repairs.
- Read and follow all the instructions in this Operator's Manual.

FIRE AND EXPLOSION:

Fire and explosion can be caused by hot slag, sparks, or the welding arc.

- Be sure there are no combustible or flammable materials and gases in the work area. Any material that cannot be removed must be protected.
- Ventilate all flammable or explosive vapors out of the weld area.
- Do not weld on containers that may have held combustibles.
- Provide a fire watch when working in an area where fire hazards may exist.

WELDING RAYS:

The welding process produces very bright ultraviolet rays. These arc rays can damage your eyes and burn your skin if you are not properly protected.

- To protect your eyes, always wear a welding helmet or shield. Also always wear safety glasses with side shields, goggles or other protective eye wear. The protective shade must be number 10 or higher for welding up to 160A.
- Keep helmet and safety glasses in good condition. Replace lenses when cracked, chipped or dirty.
- Wear welding gloves and suitable clothing to protect your skin from the arc rays and sparks.
- Protect others in the work area from the arc rays. Use protective booths, screens or shields.

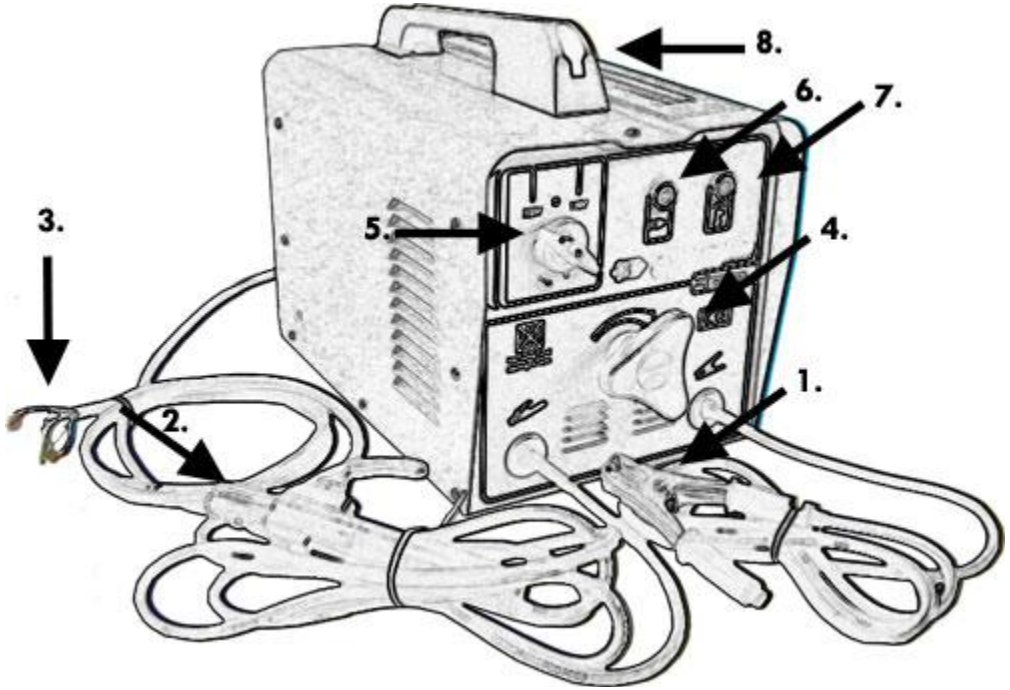
DUAL VOLTAGE WARNING: This unit is a **dual** voltage machine, and can be used both with 110VAC and 220VAC input power. It is very important to select the correct welding voltage in the machine according to the power circuit being used. Failure to do so may result in electric shock, fire, harm to you and damage to the machine.

For a list of publications and documents which can help you adopt correct operating procedures and avoid harmful actions, please consult the section "REFERENCE PUBLICATIONS" at the end of this manual.

COMPONENTS/ACCESSORIES

Below is a list of the components of the 160 DualArc stick welder by FLOPOWER:

1. Work cable/clamp (to be connected to weld piece).
2. Electrode cable/holder (holds welding electrode).
3. Input power cable (comes **without** plug).
4. Rotating Amperage control knob.
5. Power selector switch (to choose between OFF, 110V and 220V input).
6. Power indicator light (green - lights when machine is connected to electricity).
7. Overheat indicator light (yellow - lights when machine exceeds duty cycle).
8. Handle (to be mounted).
9. Chipping hammer.
10. Face shield with shade.



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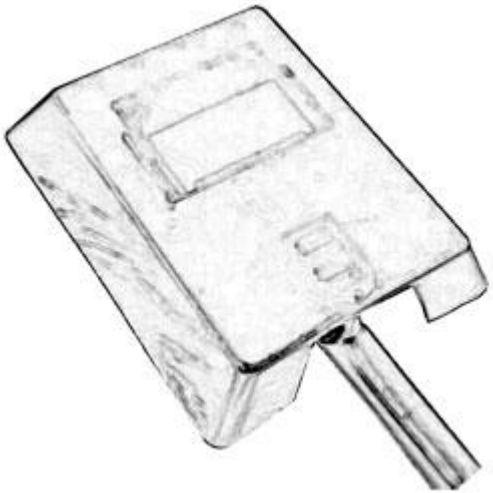

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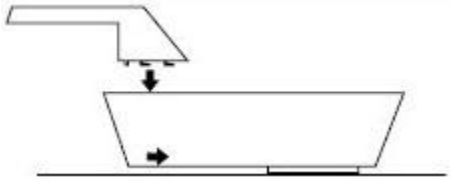
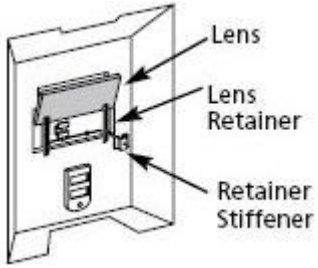
ASSEMBLY AND INSTALLATION

Carefully unpack the product and verify that all the parts and accessories identified earlier are present in the machine and do not appear to have been broken during transportation. If a missing or defective part is found, please contact your retailer to obtain a replacement.

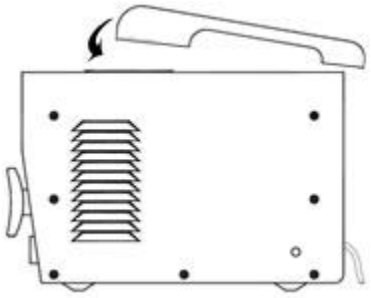
The 160 DualArc welding machine comes **without** a power plug. A qualified electrician must install on the machine a NEMA rated plug of at least 80A with proper grounding. The welding machine should be used in a dedicated circuit with a slow blow fuse or a circuit breaker rated at 90A.
Extension cords are not recommended for this machine. Do not run other appliances, lights or tools on the same circuit as the one for the welder when using it, as this may compromise your safety and negatively affect the quality of the weld.

Assemble the face shield provided with this unit following the instructions below.





Fasten the handle of the unit with a screw and screw driver as illustrated below.



OPERATION

You must identify whether your input power circuit is 110V or 220V (+/- 10%). **This will determine whether you will choose to weld in the 110V or 220V mode. Selecting the wrong welding voltage will result in damage to the welding machine.** If you are not certain of the voltage provided by the circuit, do not operate the welder, and seek assistant from a qualified electrician.

All metals that are welded must be properly cleaned of any rust, moisture, grease, plastic or other non-metal external agents before welding.

Starting with the power selector switch in the OFF ("O" symbol) position, perform the following:

a) Select the Voltage setting according to the input current being used.
b) Select the welding Amperage desired for the weld job.
c) Plug the input power plug to the power outlet being used.
d) Secure the welding electrode in the electrode holder (fix it on the non-coated end).
e) Connect the ground clamp on the metal being welded, near the weld area.
f) Cover your face with the assembled face shield.
g) Begin welding by tapping or scratching the weld area with the electrode.

The electrode will feed into the arc and create a molten metal pool that will solidify slowly. Slag (the material formed on and around the welded joint) will have to be hammered on and brushed away for a neat weld to be achieved.

Once the electrode has been depleted to about an inch from the electrode holder, the remaining stub must be discarded and the electrode replaced with a new one.

If the welding machine exceeds its duty cycle (that is, it is being used for more than one minute in a ten-minute interval, at the maximum Amperage setting), an overheat relay will automatically shut down the machine. You can resume welding once the machine has cooled down adequately.

ARC WELDING BASICS

Arc welding is a process in which metals are joined together using heat developed by a welder. Current passes through the metals via the work clamp and the electrode (and the electrode holder), thus forming intense heat which results in a weld. The incandescent space between the weld area and the burning electrode is commonly referred to as the arc.

This unit is an AC (alternating current) welder, which means that current travels in both directions of the welding circuit, in quick alternations (50 or 60 times per second, for 50Hz and 60Hz frequencies).

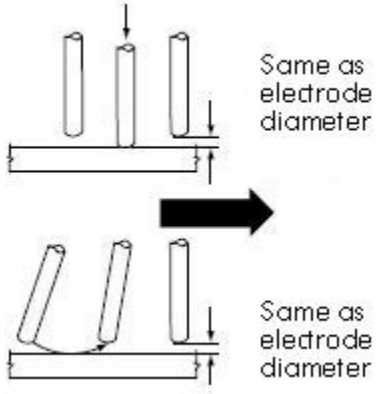
Electrode selection:
The diameter (thickness) of the welding electrode should be approximately the same as the thickness of the metal being welded. However, specific electrodes have different properties suited to the welding job to be done, such as type of metal, weld position, type of flux (coating) of the electrode etc. The thicker the metal, and the electrode, the higher the amperage setting needed to weld (this can be seen on the chart on the top portion of the welding machine). Read the instructions of the electrode you are using, as they contain more specific guidelines. The chart below provides a benchmark for welding carbon steel with an E6013 electrode.

Electrode diameter	Metal thickness	Amperage needed
1/16 inches ; 1.6mm	1/16 inches ; 1.6mm	40-55
1/16 inches ; 1.6mm	5/64 inches ; 2.0mm	50-70
1/16 inches ; 1.6mm	3/32 inches ; 2.4mm	75-95
1/8 inches ; 3.2mm	1/8 inches ; 3.2mm	100-140
1/8 inches ; 3.2mm	5/32 inches ; 4.0mm	140-180

Current:
Current represents the actual flow of electricity and is regulated by a rotating knob on the welder. The current to be used depends on the size (diameter) and type of electrode used, position of the weld, and the thickness of the weld piece. Consult specifications listed on the electrode package or generalized chart in the case of the unit. Excessive current burns through light metals, and the weld bead is flat and porous or the bead undercuts the work piece. The bead appears high and irregular if the current is too low.

Starting:

Initiating the arc may be challenging, especially to the novice welder. It is recommended that users practice and familiarize themselves with the machine by welding some scrap metals before starting a job. An arc can be initiated by either scratching or tapping the electrode onto the weld metals. After the arc is started, it is important to swiftly leave a slight gap, or the electrode will weld itself onto the metal. However, the gap must not be too large; otherwise the arc will die down. (See drawing next page).



Weld Angle: To ensure a proper weld, a correct weld angle must be maintained during the welding process. The electrode must form a 70° to 80° angle with the surface being welded.

Arc Length:

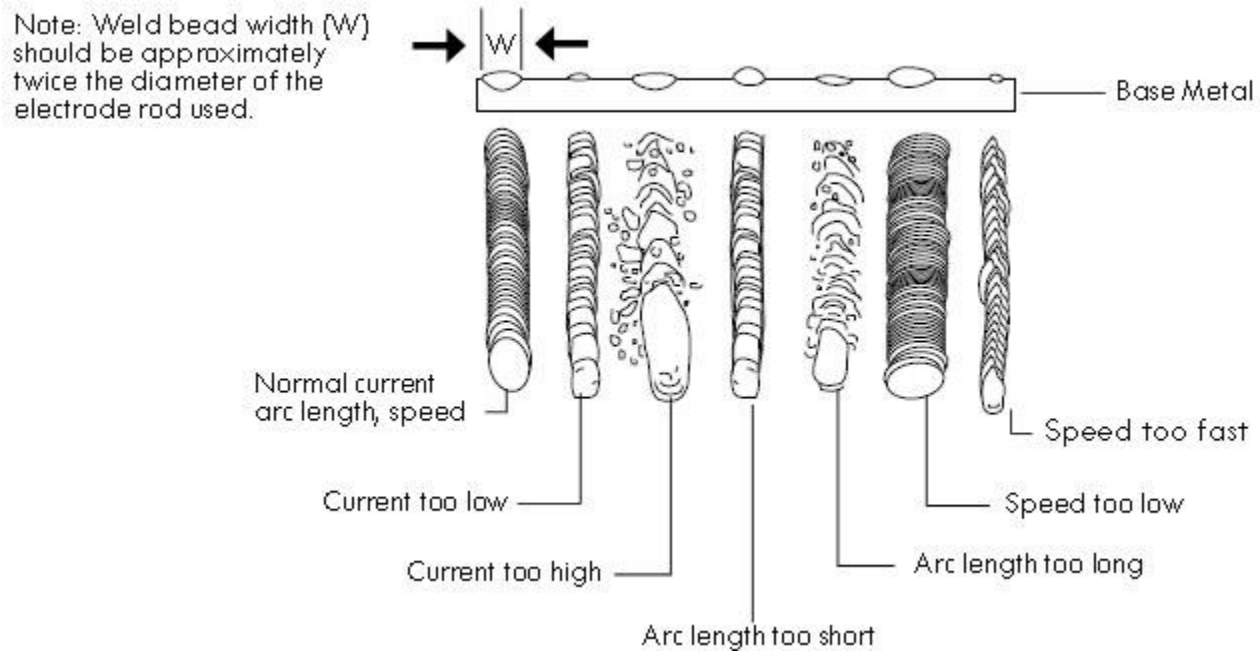
Arc length is the distance from the work piece to the tip of the electrode and it is constantly being adjusted as the electrode is used up during welding. A proper arc length is essential to generate the heat needed for welding. Too long an arc results excessive spatter, poor penetration and a flat weld bead. Too short an arc does not create enough heat to melt the metals, and the electrode has a tendency to stick, penetration is poor, and uneven beads with irregular ripples result. A proper arc should be no longer than the diameter of the rod. The sound of a proper arc is a steady, crisp sizzle.

Arc speed:
Because the electrode is melted continuously into the weld, it is important to continue feeding the electrode accordingly. However, this must be done at the right speed. When the travel speed is too fast, the resulting bead is narrow and penetration is poor. When the speed is too slow, the bead is high and wide and the metal tends to overheat.

Overheat protection:
The unit will automatically shut down once the duty cycle is reached. Ensure proper air flow in/out of the vents of the machine to avoid premature overheating. The unit should have enough unobstructed air space around it at all times.

Passes:
Sometimes, more than one pass is necessary in order to obtain a strong weld. You should ensure that any slag is removed from the weld and that the metal is properly cooled after performing subsequent passes.

Quality of the bead:
The graphic below provide guidelines to evaluate the weld based on the appearance of the weld bead.



BASIC CARE

Always unplug the welder when it is not being used.

Worn parts or damaged parts (cables, switches, plugs, handle) should be replaced promptly (see Parts List).

When the welder is used outdoors, it should be kept from rain or long exposure to the sun.

Inspect the welding cables from time to time to ensure that they are in good condition.

If the welder is not in use for a long time, it should be kept dry and have good ventilation to free it from moisture, corrosive agents etc.

The welder should be kept at temperatures ranging from -25°C (-13°F) to +55°C (131°F), and at relative humidity of no more than 90% (measured at 25°C) when stored and not in use. While being utilized, the welder should be kept between -10°C and +40°C.

Do not allow any external objects to intrude into the welder case through its vents.

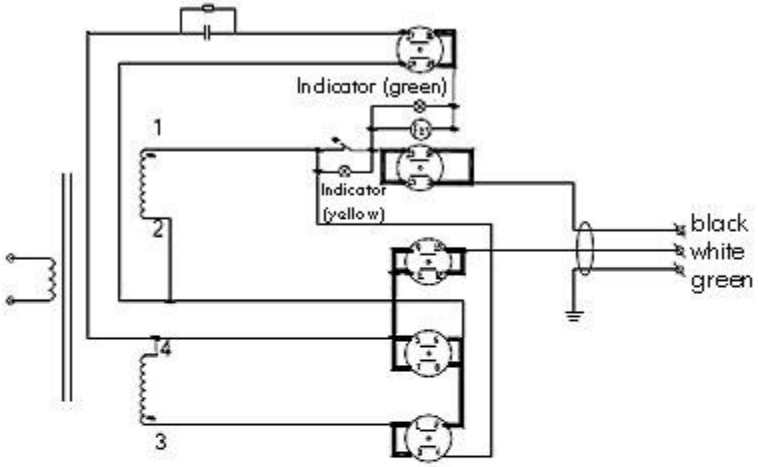
Make sure the unit is not dropped, shaken or otherwise damaged physically.

At least once a year, remove any accumulated dust and check the machine's external fasteners to make sure there are no loose connections. **If you need to open the case for an inspection of the internal components, you must make sure the unit is not plugged into an electrical circuit.**

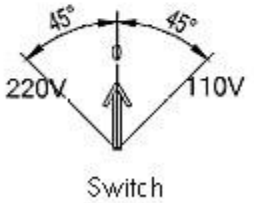
The welder must be serviced /repaired only by a qualified technician.

TECHNICAL SPECIFICATIONS / WIRING SCHEMATIC

Welding Current Range	Input	Duty Cycle	Rated Input Current	Input Power Cable	Input Capacitance	Open Circuit Voltage	Rated Output Voltage	Insulation Grade	Case Protection Grade	Overload Protection	Cooling
55-160A, AC	110VAC or 220VAC, 1 Phase, 60Hz	160A at 10% 113A at 20% 86A at 35%	38A or 76A at 160A output	16mm^2	7.7 KVA	47-50V	24.4V at 160A	H	IP21S	Automatic shutdown	Fan-cooled

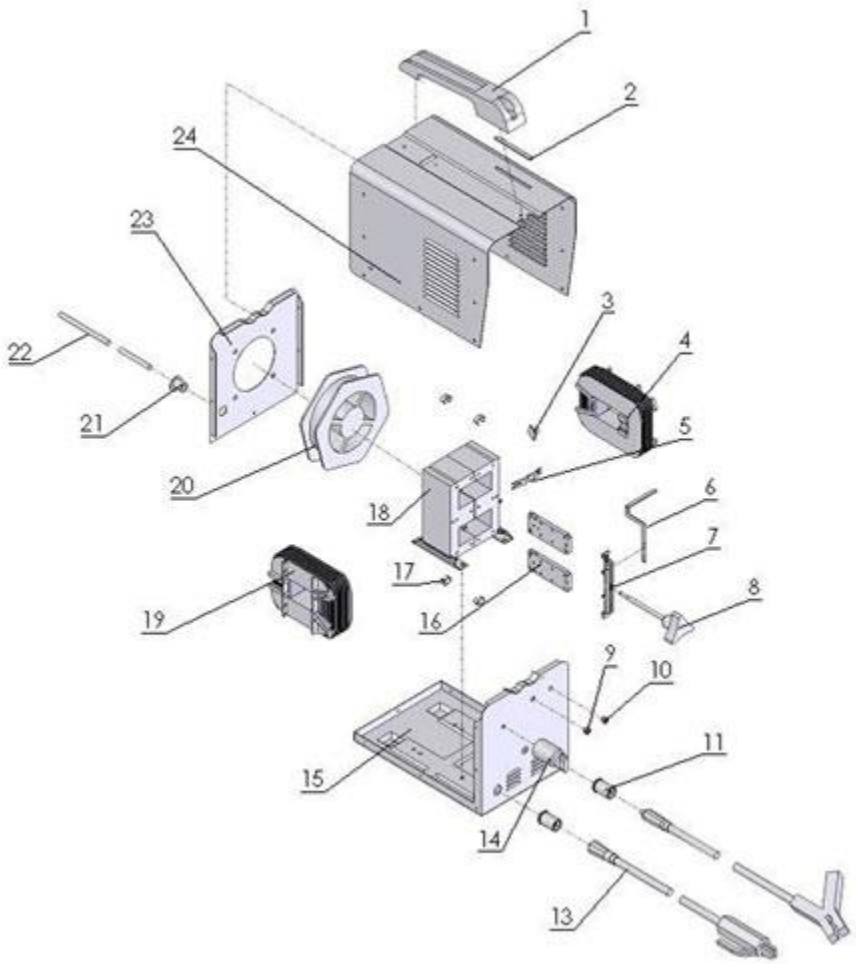


	220V	0	110V
1、2	×		
3、4			×
5、6			×
7、8			×
9、10	×		×
11、12	×		×
13、14	×		×
15、16	×		×
17、18	×		
19、20			×



PARTS LIST

Exploded View



Descriptions	Part Numbers
1. Handle	FLOW160DA001
2. Amperage/current indicator	FLOW160DA002
3. Heat Relay	FLOW160DA003
4. Secondary Winding	FLOW160DA004
5. Inset	FLOW160DA005
6. Indicator (amperage)	FLOW160DA006
7. Sliding iron-core bracket	FLOW160DA007
8. Rotating Amperage control	FLOW160DA008
9. Power indicator light (green)	FLOW160DA009
10. Overheat indicator light (yellow)	FLOW160DA010
11. Cable connection	FLOW160DA011
12. Work cable/clamp	FLOW160DA012
13. Welding cable/holder	FLOW160DA013
14. Power selector switch	FLOW160DA014
15. Underpan	FLOW160DA015
16. Sliding-iron Core	FLOW160DA016
17. Nip	FLOW160DA017
18. Static-iron Core	FLOW160DA018
19. Primary Winding	FLOW160DA019
20. Axle-shaped Fan	FLOW160DA020
21. Input cable support	FLOW160DA021
22. Input power Cable	FLOW160DA022
23. Back panel	FLOW160DA023
24. Case	FLOW160DA024
25. Operator's Manual (not shown)	FLOW160DA025
26. Warnings Dekal (not shown)	FLOW160DA026
27. Descritpive leaflet (not shown)	FLOW160DA027
28. Face shield (not shown)	FLOW160DA028
29. Chipping hammer (not shown)	FLOW160DA029

TROUBLESHOOTING

Problem	Possible Fault	Correction
Welder does not power up (indicator light is not on).	No power is available at receptacle. The input power cable is damaged or broken.	Check fuses or breakers. Have cable replaced or repaired.
Welder stops working during welding operation.	Unit has reached or exceeded its duty cycle – the yellow overheat indicator light should light. Work clamp has been detached from weld area.	Allow machine to cool off. Reconnect the work clamp with the weld piece.
Unit is powered (green light is on) but no weld current is generated.	There is a bad or no connection between work clamp and work piece. Insufficient input current is available. Incorrect Voltage has been selected.	Properly connect work clamp and weld piece. Utilize an adequate power circuit. Select the voltage (110V or 220V) that matches the input current being supplied.
Unit is powered (green light is on) but no weld current is generated.	There is a bad or no connection between work clamp and work piece. Insufficient input current is available. Incorrect Voltage has been selected.	Properly connect work clamp and weld piece. Utilize an adequate power circuit. Select the voltage (110V or 220V) that matches the input current being supplied.
Arc is unstable or wavers.	Metal is soiled, greasy.	Clean the metal surface with wire brush.

Unit overheats prematurely.	An extension cord is being used. Electrode being used is too thick.	Relocate the welder or use a thicker extension cord. Use smaller diameter electrode.
It is difficult to start the arc.	Electrode diameter is too large for the Amperage setting. Work clamp is not properly attached to the weld metal or is attached too far from the weld area. Power line is being shared by other electrical apparatuses.	Reduce electrode size or increase Amperage. Secure the work clamp properly Use a dedicated power line for the welder.
Excessive spatter occurs.	Electrodes are humid, soiled or cracked.	Use pristine, dry and undamaged electrodes.
Weld bead is irregular: too thin, too thick, shows poor penetration.	Travel speed, angle or arc distance is incorrect.	Ensure proper travel speed, position of electrode, and proper arc distance from the weld piece.

REFERENCE PUBLICATIONS

Refer to the following standards or their latest revisions for more information on safety during welding operations:

1. OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
2. ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING, obtainable from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126.
3. NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
4. ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018.
5. ANSI Standard Z41.1, STANDARD FOR MEN'S SAFETY-TOE FOOTWEAR, obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018
7. AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES, obtainable from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126.
8. NFPA Standard 51, OXYGEN-FUEL GAS SYSTEMS FOR WELDING, CUTTING AND ALLIED PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.
9. NFPA Standard 70, NATIONAL ELECTRICAL CODE, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.
10. NFPA Standard 51B, CUTTING AND WELDING PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.
11. CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS, obtainable from the Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.
12. CSA Standard W117.2, CODE FOR SAFETY IN WELDING AND CUTTING, obtainable from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.
13. NWSA booklet, WELDING SAFETY BIBLIOGRAPHY obtainable from the National Welding Supply Association, 1900 Arch Street, Philadelphia, PA 19103.
14. American Welding Society Standard AWSF4.1, RECOMMENDED SAFE PRACTICES FOR THE PREPARATION FOR WELDING AND CUTTING OF CONTAINERS AND PIPING THAT HAVE HELD HAZARDOUS SUBSTANCES, obtainable from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126.
15. ANSI Standard Z88.2, PRACTICE FOR RESPIRATORY PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018.