



OPERATING MANUAL



FVS-450 Voltage-sensing Wire Feeder

**THE NEW FORCE IN
WELDING**

ATTENTION

PLEASE READ THIS MANUAL CAREFULLY AND FOLLOW ITS INSTRUCTION!

- ONLY AUTHORIZED PROFESSIONALS SHOULD ATTEMPT TO MAKE REPAIRS OR REPLACE CRITICAL COMPONENTS..
- WHEN OPENING PANEL, UNIT MUST BE DISCONNECTED FROM ANY INPUT CURRENT.
- GENUINE OR APPROVED REPAIR PARTS SHOULD BE USED TO REPAIR.

04/2018

SAFETY & PRECAUTION

- Please read manual before operating feeder.
- Please obey all the safety instructions and guidelines
- Be aware of your surroundings, make sure all flammable or dangerous materials are not in your area of welding.
- Welding can create harmful conditions wear appropriate and approved clothing and protective equipment.

Illustration for Safety Mark



- This group of signs indicate; “warning danger”, “electric shock”, “moving part”, “hot burn hand”.
- Please refer to the safety mark and the corresponding safety stipulation.

Electric Shock can kill



- Don't touch live parts.
- Please turn off all input power when conducting maintenance.
- Please be fasten to cable's connection, then insulation
- Use dry and insulated gloves while welding.
- Please do not enter both hands in the feeder when testing while feeder is running, keep another outside
- Disengage feeder from power source before moving.
- Before opening the feeder case, disengage feeder from power source and wait for at least 1 minute
- Turn off the welding machine when it is not in use.
- Before touching the components, turn off the machine and disengage from power source.
- Discharge the capacitor before working on internal components.

Static electricity damage circuit



- Use static strap against static electricity before transporting circuit and the components
- Use an appropriate anti-static electricity bag when shipping PC board.

Fire & explosion



- Do not to set the feeder on hot surfaces.
- Remove all combustible or flammable from welding area.
- Do not weld in enclosed spaces, welding gases may displace air and cause suffocation.
- Be sure to keep the cable connection and other electrical wires in the good condition.
- Welding cables need to be replaced if insulation is frayed or has cracks of nearest the place of welding.

Eye Damage



- Wear approved safety glasses while not welding for your protection.
- Always wear protection while grinding or chipping.

Arc Rays can burn



- Wear approved face shield with the proper filter and cover plates to protect your eyes from sparks the rays of the arc; Use suitable clothing made from flame-resistant material to protect your skin.

Hot work piece may cause burning



- Do not touch hot work piece with bare hand, were appropriate gloves.
- Allow piece to cool or use proper tool to pick up.

The wound & harms the part exploding



- Use only approved replacement components, using components not suitable for feeder operation may cause catastrophic failure.
- Wear approved safety equipment to conduct maintenance of feeder.

Electric Shock can kill



- Turn off the welding machine power before connecting feeder
- Do not operate in a wet environment or in the rain.
- Be careful of welding near other high current electrical circuits.

The reference



- The reference book notice the safety items of welding
- Only uses the quality components.

Electric and Magnetic Fields may be dangerous



- EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

Falling goods may damage machine and personal injury



- Feeder platform must be stable and level to support the feeder while operating.
- If using a cart to move the feeder, must can do so safely.

The excessive use may cause machine overheated



- Do not exceed rated duty cycle, allow the feeder to cool if overheating.
- Before starting again, reduce the welding current or reduce the operating time.
- Do not block air flow and do not allow air filter to clog air flow.

Fumes and Gases can be dangerous



- Avoid breathing welding fume, use approved safety equipment or weld in a well-ventilated area.
- Use enough ventilation and/or proper exhaust system to keep fumes away from the breathing zone.
- Read and understand the manufacturer's instructions for equipment and the consumables to be used, including safety data sheet (SDS) and follow your employer's safety practices.

Safety Equipment



- Wear approved safety hat, protection glasses and ear plugs. Approved welding face shields should have proper lenses and shade for the welding process application. All clothing should be nonflammable and cover all areas of your skin to avoid sparks and arc rays.

Thank You for selecting a quality product

- **Read this Operator's Manual completely** before attempting to use this equipment. Save this manual and keep it handy for quick reference.

Please Examine the Carton and the Machine for Damage Immediately

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time when the shipment is received.

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Model Name & Number:

Code & Serial Number:

Date of Purchase:

Whenever you request for replacement parts or information of this equipment, please always provide the above recorded information.

Table of Contents

1.	Standard outfits and application	7
1.1	Product composition Application	7
1.2	range for FSV-450	7
1.3	Characteristic for FSV-450	7
2.	General Introduction	8
3	Parts Name and Functions	8
4	Technical specification	9
4.1	Technical parameters	9
4.2	Environment	9
5.	Before use	10
5.1	Connecting the cables	10
5.2	Selecting the welding wire	10
5.3	Mounting the wire spool	11
5.4	Mounting the wire feeding	11
5.5	Drive the welding wire	11
5.6	Mounting the MIG/MAG welding	12
5.7	Changing the guide tube/ back guide	12
6.	Welding operation	12
7.	Maintenance	13
7.1	Regular maintenance	13
7.2	Fault diagnosis and troubleshooting	13
7.3	Circuit Diagram	14
7.4	Major Parts List	15
8	Transportation, Storage and Environmental Limitations	15
9	After-sales Service	15

1. Standard outfits and Application

1.1 Product composition

FVS-450

Model	Item	Description
Suitcase	Unit	Polymer case
	TS-400-15-LN	MIG Torch 400 Amp
	Drive Rolls	V-Groove, Knurled, U Groove
	Voltage Sensing Cable	Reacts to current power input

1.2 Application range for FVS-450

- Base metal: Various steels, Stainless Steel, Aluminum.
- Thickness of base metal: Sheet metal - 3/8" single pass & multi-pass for thicker.
- Wire diameter(mm):Flux-cored welding wire $\Phi 1.2$ - $\Phi 2.0$ or max. 2.4mm
- Gasless welding wire $\Phi 1.6$ - $\Phi 2.0$ or max. 2.4mm Solid welding wire $\Phi 1.0$ - $\Phi 1.6$ mm

1.3 Characteristics for FVS-450

Model		FVS 450
Technical Parameters	Output Current	450A
	Weight	40Lbs. (18kg)
	Duty Cycle	60%
Other features	<ul style="list-style-type: none">•Suitable for CC/CV power source Excellent arc ignition•Easy operation, easy connection with power source Good reliability•Automatically suit the change of welding polarity. Suitable for most DC power source•Scale/Digital Meter/LCD show parameter separately	

2. Introduction

FVS-450 wire feeder is a high-tech with advanced technology for voltage-sensing for most DC welding power sources.

The voltage-sensing wire feeder uses the welding voltage from the power source to generate the energy required for controlling the wire feeder's operation. Before welding, you just select the desired settings for the feeder and the power source according to the welding requirements, of the base materials, filler materials, and the shielding gas. When you start welding in CC, the feeder can control parameters.

For normal MIG/MAG welding, the parameters' values are controlled by the power source via the control cable, but voltage-sensing technology makes such a control cable between the power source and the feeder unnecessary.

Constant Current (CC) power source

The CC type of welding machine can change the wire feeding speed according to the arc voltage. The voltage will change with different arc lengths but with slight change for current.

Constant Voltage (CV) power source

The CV type of welding machine can maintain a relatively stable, consistent voltage regardless of the change of current. It results in a relatively flat volt-amp curve. The MIG/MAG welding machine.

3. Parts and Functions



Do not change control switch positions while welding.



Front Panel

- Torch Connection Lincoln or EURO style
- VSLEAD: voltage sensing lead used for connecting voltage sensing cable.
- WFS (Wire feeding speed): adjusting welding wire speed.
- WFS display: used for wire feeding speed.
- POLARITY indicator: when DCEN Polarity (Straight) is indicated.
- POWER indicator: when power is on.



Rear Panel

- WELDING cable connection to welder.
- Gas inlet: for shielding gas.
- T2/T4 trigger control.
- Flowmeter used for gas regulating.
- Overload reset button.



Drive Compartment

- Power Switch
- CC/CV Switch
- Wire Jog Button
- Gas Purge Button
- Drive 4 roll assembly
- Hand Drive Roll Caps
- Star Nut
- MIG Gun Holder & Lock

4. Technical Specification

4.1 Technical parameter

Model		FVS-450
Rated power (W)		150
Load capacity(A)		400Amps @ 100% Duty Cycle
Specification for wire spool(mm)		12 ins. - 300 mm
Weight		40 Lbs. - 18kg
Overall dimension (L×W×H) (mm)		24X10X17.5 ins. - 610×255×440 mm
Input voltage		15VDC-100VDC
Connector type for MIG torch		Lincoln*/Tweco* (Euro Optional)
Drive Roll Feed Type		4 roll System Metal Housing
Wire Feed Speed		0-705 ins/min 0-18m/min
Wire Type/Size	Flux-cored	.045''-5''/64 1.2-2.0 mm
	Gasless	.045''-5''/64 1.2-2.0 mm
	Solidφ(mm)	.035''-1''/16 1.0-1.6 mm

*All company names are registered to their respective holders. Use of them does not imply any affiliations or endorsements by them.

Don't operate the equipment in rain!

4.2 Environment

- Maximum ambient temperature range is: 104 °F - 15 °F (40 C° to -10C°).
- Extreme temperatures and environments can affect feeder performance.,
- Avoid dropping, violent vibration and bumps.
- Periodically clean the drive rolls, guide tube and softly blow out accumulated internal dust.

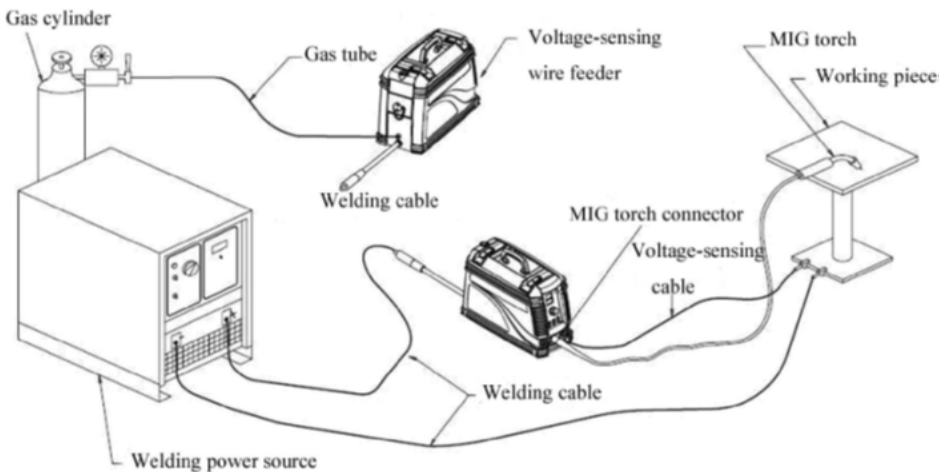
5. Before use

Examine the ground clamp, cable connections and welding cables for defects.

5.1 Connecting the FVS-450

To connect the feeder, do the following: **Power source and feeder should be turned off.

1. Connect the ground clamp to the workpiece.
2. Connect the voltage-sensing cable to the feeder, then connect the voltage-sensing clip to the workpiece or ground clamp.
3. Connect the shielding gas hose from gas regulator to gas inlet fitting.
4. Connect the welding cable from the power source to the cable connector of the feeder.
5. Once all connections are secure, turn on power source and then feeder.



- ARCPRO-450 will sense the welding polarity automatically, yellow indicator light if straight polarity (EN)

5.2 Selecting welding wire

Select the suitable welding wire according to the application, filler materials and shielding gas. VSR-450 is optimized for use with a wide variety of wire types and sizes:

- Flux & Metal Cored Wire: .045" - 3/32" (1.2 - 2.4mm)
- Gasless Wire: .045" - 3/32" (1.6 - 2.4 mm)
- Solid Steel Wire: .035" - 1/16" (1.0-1.6 mm)
- Solid Aluminum Wire: .035" - 1/16" (0.9 - 1.6mm)

- **FVS-450 standard spool size 12" (300mm) wire spools, but 8" (200mm) wire spool also can be used.**

5.3 Inserting the wire spool

- 1. Remove star flange nut by turning clockwise
- 2. Mount the spool on the shaft and align the dowel pin with the spool dowel recess.
- 3. Push the wire spool onto the dowel.
- 4. Replace the star flange nut type turning counterclockwise until snug.

5.4 Installing wire feed rollers

Use the appropriate wire feed roller and groove as per welding wire type and diameter.



Groove wire size will be facing you.

Check and remove any dust or iron powder, built up around back of inlet guide.

V=Vee Groove

U=U Groove

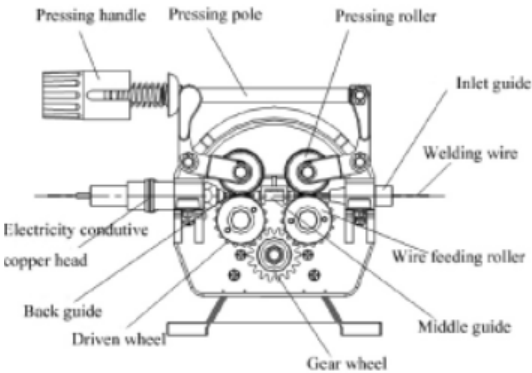
K=Knurled Groove

*V- Groove not recommended for cored wires as it may open up the seam or crush the wire shell.

Wire type	Steel/SS Solid wire	Aluminum Solid Wires	Flux-Metal Cored Wires	Gasless Cored Wires
Drive Roll Groove Style	V type	U type	U/K type	U/K type

5.5 Feeding welding wire (Refer to the following diagram)

- 1. Release spring pressure by rotating pressure adjusting knob counterclockwise and release.
- 2. Feed wire through the back guide, drive rolls and inlet guide.
- 3. Replace pressure adjusting knob firmly and tighten clockwise until #2 position is indicted.
- 4. Press wire inch button making sure wire feeds for at least 6 ins. (150mm).
- 5. Connect MIG gun to the feeder, lay gun out straight, press inch button until wire is visible at the end of MIG gun.



5.6 Mounting the MIG/MAG welding gun

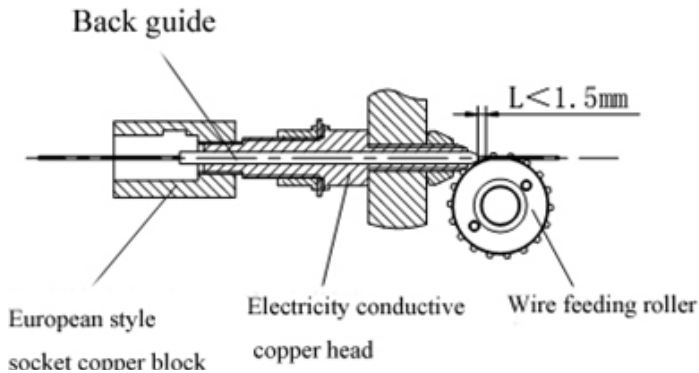
1. With wire extended beyond feeder insert MIG Gun power pin into gun receptacle firmly. Tighten set screw bolt to hold gun.
2. Feed welding wire 1" beyond end of gun, trim wire as required.

*If welding aluminum or stainless steel, use appropriate liners and consumables.

** Review and follow instructions inserted in MIG Gun box for liner and consumable installation and repair

5.7 Changing the guide tube/ back guide

1. Disconnect guide tube/back guide
2. Disconnect the welding torch.
3. Take out the back guide from one side of wire feeder torch socket.



5.7.1 Mounting guide tube/ back guide

1. Insert the back guide to one side of torch socket ($\phi 0.8$, $\phi 1.0$ solid welding wire, please select the back guide with inside diameter ($\phi 2.0$ exports), notice the distance between back guide and wire feeding roller is less 1.5mm.
2. Mount the torch socket.
3. Reinsert the MIG torch on wire feede

6. Welding operation

Operation procedures:

- Choose the CC or CV mode according to the output of the welding machine.
- Connect the FVS-450 with welding machine and turn ON welding machine.
- Adjust welding parameter (A or V) according to the specific welding requirements.
- Set the parameters by adjusting wire feeder to suit the wire feeding speed according to power source.
- Start welding.

7. Maintenance



- Turn OFF power before conducting any maintenance inside the feeder.
- Check the connections for proper ground and connection between feeder and welder.
- Check the conditions of the output terminals of the power source whether loose or broken, reconnect or replace if necessary.
- Check the connection of the welding cable for cracks and tears in insulation.
- Check whether there is abnormal vibration, noise, foul smell from the feeder.

7.1 Regular Maintenance

- Using clean dry air (never oxygen), blow out dust from interior of feeder.
- Occasionally clean drive roll grooves.
- Replace worn or defective cables and grounds.

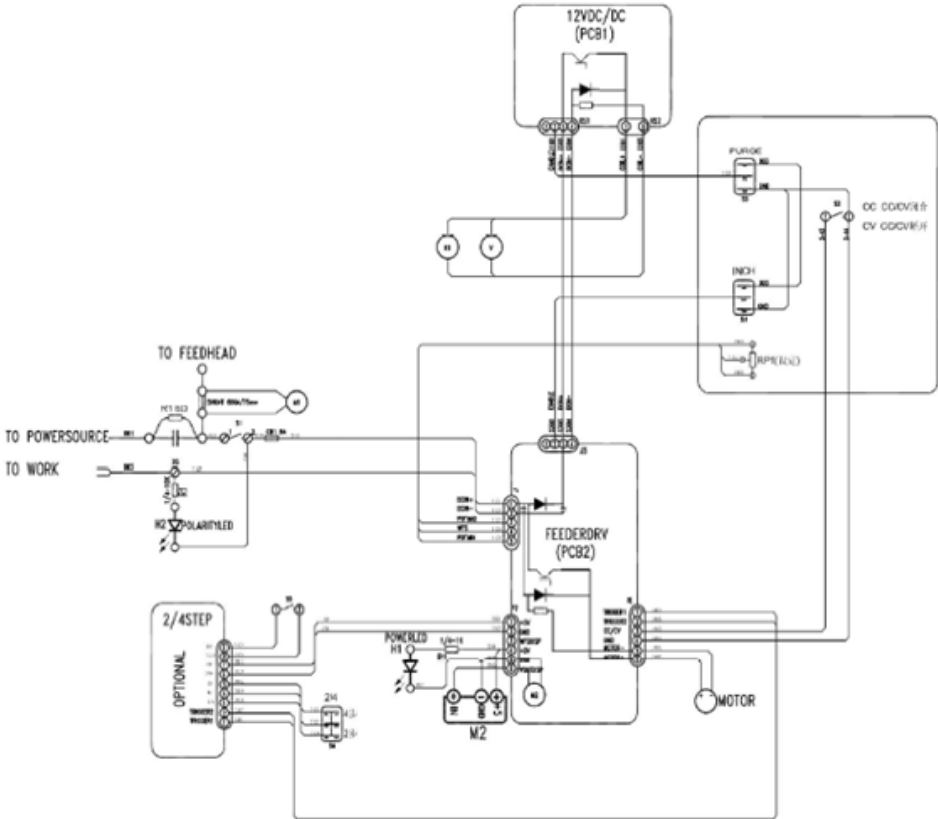
7.2 Troubleshooting

Only authorized trained personnel should make any major repairs or if feeder unit has to be internally checked, contact Sumig to find authorized repair centers.

Problem/Issue	Cause	Recommended
No power when power switch is set to on.	Check connection for voltage-sensing of wire feeder.	Check and connect the power cables
	Unit overloaded	Reset overload fuse.
	Switch for this function may be broken.	Replace with new one.
	No power from source welding machine	Confirm welding machine is on and operating. Check welding cable connection
Purge button is pushed and no shielding gas flows.	Gas valve doesn't open.	Check and open it.
	Magnetic valve may be damaged.	Test and replace if defective
	Power board may be damaged.	Test and replace if defective
Jog button is pushed motor doesn't rotate.	Inch switch may be broken.	Test and replace if defective
	Motor may be damaged.	Test and replace if defective
	Feed drive module may be damaged.	Test and replace if defective
Weak or no Arc when gun trigger is pulled.	CC/CV mode isn't correct	Set CC/CV switch to correct welder mode.
	Under CC the dynamics setting for power source can't reach the max.	Have system checked.
	Incorrect welding parameters	Set parameters according to wire manufacturers guidelines.
Rough, weak or inconsistent arc	CC/CV mode is incorrect	Change feeder switch or change output mode on welder.
	Incorrect polarity	Use polarity recommended by wire manufacturer.
	Perhaps abnormal output from welding power source	Please check the welding power source.

7.3 Circuit Diagram

FVS-450 Schematic



**Refer to the Major Parts List as below.

7.4 Major Parts List

- Symbol of the table is same as the circuit diagrams

Cause	Name	Specification	Order	Remark
	Welding cable socket	K12B+K12C	S06001	
S1	Power switch		S06004	SPST
M1 M2	Digital display	L5135	S05005	
RP1	Current adjusting potentiometer	WX010-5K 5%	S06006	
PURGE	Selection switch		S06007	SPST
INCH				
CB	Fuse	8A	S06008	
	Power board		S06009	
	Drive board		S06010	
K1	DC Contact	GSZ-400S-DC12V	S06011	
V	Magnetic valve	DF2-3/DC12V	S06012	
MOTOR	Motor	120SN010-C	S06013	120SN01-C
	Wire feeding roller			

8. Transportation, Storage and Environmental Limitations

- If shipping feeder, must be secure against Package: wooden pallet or carton. During transportation, please strictly obey the rules written in package.
- Operating Eenvironment: During welding:
0°C ~ 40°C;
Can meet the special requirements: -10°C ~ 40°C;
Others: -25°C ~ +55°C.
- Relative humidity of the surrounding environment:

40°C: U50%RH
20°C: U90%RH

9. Aftersales Service

After-sales service, please do the following.

- Examine the equipment for shipping damage.
- Read Instruction Manual.
- When contacting Sumig or distributor purchased from, have the following information

- Address, Name, Tel No.
- Model of the equipment
- Serial No.
- Other details for the equipment details.

Note: Model, date, number etc. can be found on the nameplate.

FSV-450 2 Year Limited Warranty

- Terms and Conditions
- Failure to notify Sumig or approved seller of defects or damages within a timely manner could negate the warranty provisions.
- Warranty is non-transferrable without prior consent of Sumig
- Unit purchased is within 2. Years of purchased date.
- Warranty is for manufacturers defective parts or material only.
- Replacement or repair is solely Sumig's decision.
- Sumig accepts no responsibility for products lost, damaged or mislaid whilst in transit, claims re to be filed with carrier, make sure to note received with damages.
- Sumig may (at their sole discretion) accept the return of Goods for credit but this may incur a handling fee of up to fifteen percent (15%) of the value of the returned Goods plus any freight costs.

PURCHASER'S REMEDIES:

EXPRESSLY ACCEPTED IN SELLER'S ACKNOWLEDGMENT, OR SELLER'S PERFORMANCE IN CONNECTION WITH ANY CLAIM ARISING OUT OF ANY RECALL, DEFECT OR ALLEGED DEFECT IN ANY GOODS OR SERVICES FURNISHED BY SELLER, SHALL BE LIMITED EXCLUSIVELY TO THE RIGHT OF REPAIR OR REPLACEMENT OF SUCH GOODS OR SERVICES, AT SELLER'S OPTION.

MAKING A CLAIM

If you wish to make a claim under this Warranty, you must:

- Obtain a RNA authorization from Sumig
- Return the product to the point of purchase either in person or on a prepaid courier; or Contact Sumig by telephone or E-mail.
- **When returned, the product must be accompanied with invoice copy which includes the purchaser and the purchase date**
- All costs of installation, cartage, freight and maintenance are the purchaser's responsibility.
- **To the extent permitted by law, our total liability for loss or damage of every kind related to the product in any way whatsoever is limited to the amount paid to the retailer by you for the product or the value of the product.**

WARRANTY EXCLUSIONS

This Warranty covers Material and Faulty Workmanship defects only.

This Warranty does not cover damage caused by:

- Normal wear and tear due to usage
- Misuse or abusive use of the product.
- Failure to clean or improper cleaning of the product or proper maintenance.
- Improper installation Incorrect voltage or non-authorized electrical connections
- Use of non-authorized or incorrect parts
- Failure or any breakage caused by overload, dropping or abusive treatment or use by the customer
- Repair, modifications or other work carried out on the product other than by an Authorized SUMIG repair center or reseller may void the warrantee.

Unless it is a manufacturing fault, this Warranty does not cover the following parts:

MIG consumables or any MIG gun part considered to degrade during the welding process, Wire Guide, Drive Rolls, Electrodes, Arc Leads, Welding Cable, Electrode Holder, Earth Clamps

This Warranty does not cover products purchased:

- From a non-authorized Dealer (such as purchases from unauthorized retailers or private sales.

These conditions may only be varied with the approval of Sumig management.

REMEMBER TO RETAIN YOUR ORIGINAL INVOICE FOR PROOF OF PURCHASE.

Information is subject to change without notice, latest version can be downloaded on Sumig website.

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