



DA121MIG OWNER'S MANUAL



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Please read and understand this instruction manual carefully before the installation and operation of this machine.

The contents of this manual may be revised without prior notice.

1. SAFETY

Welding and cutting is dangerous to the operator, people in or near the working area, and the surrounding, if the machine is not correctly operated. Therefore, the performance of welding/cutting must only be under the strict and comprehensive observance of all relevant safety regulations. Please read and understand this instruction manual carefully before the installation and operation.

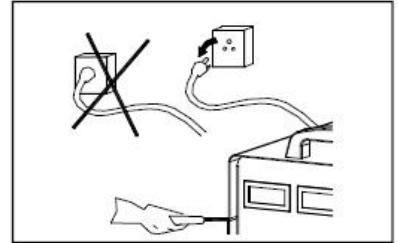
The switching of function modes is possibly damaging to the machine, while the welding operation is performed.

Do disconnect the electrode-holder cable with the machine, before the performance of welding.

A safety switch is necessary to prevent the machine from electric-leakage.

Welding tools should be of high quality.

Operators should be qualified.



Electric shock: It could be fatal!

Connect the earth cable according to standard regulation.

Avoid all contact with live electrical parts of the welding circuit, electrodes and wires with bare hands. It is necessary for the operator to wear dry welding gloves while he performs the welding task.

The operator should keep the working piece insulating from himself/herself.



Smoke and gas generated while welding or cutting: harmful to people's health.

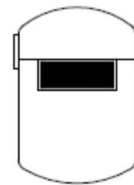
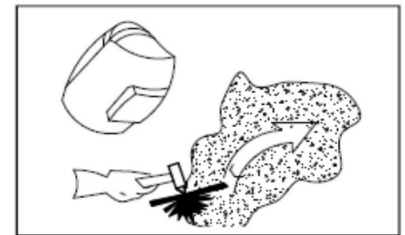
Avoid breathing the smoke and gas generated while welding or cutting.

Keep the working area well ventilated.

Arc rays: harmful to people's eyes and skin.

Wear welding helmet, anti-radiation glass and work clothes while the welding operation is performed.

Measures also should be taken to protect people in or near the working area.



Fire hazard

The welding splash may cause fire, thus remove flammable material away from the working place.

Have a fire extinguisher nearby, and have a trained person ready to use it.

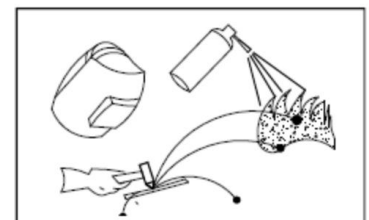
Noise: possibly harmful to peoples' hearing.

Noise is generated while welding/cutting, wear approved ear protection if noise level is high.

Machine fault:

Consult this instruction manual.

Contact your local dealer or supplier for further advice.



2. GENERAL DESCRIPTION

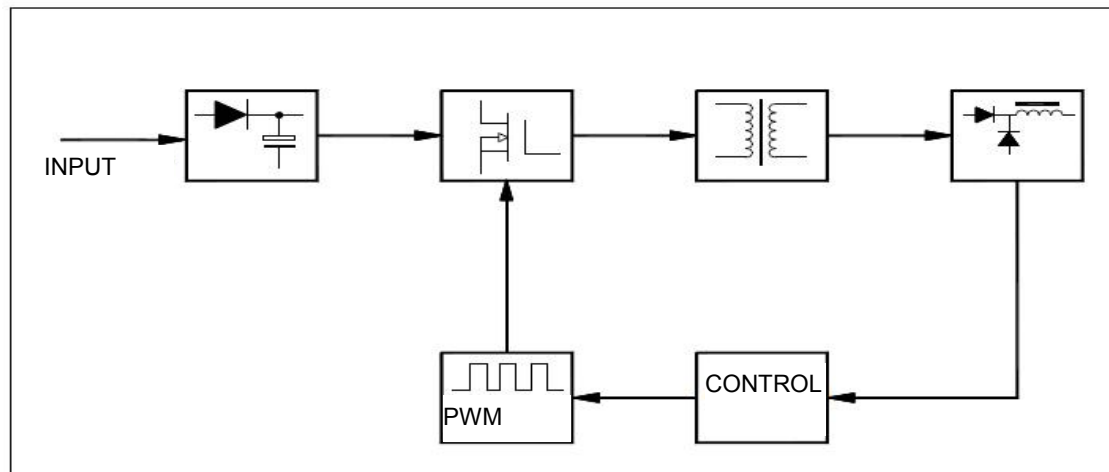
This welding machine is composed of the inverter MIG welder power supply with invariable voltage output external characteristics manufactured with advanced IGBT inverter technology designed by our company. With high-power component IGBT, the inverter convert the DC voltage, which is rectified from input 50Hz/60Hz AC voltage, to high-frequency 42KHz AC voltage; as a consequence, the voltage is transformed and rectified. The features of this machine are as follows:

- IGBT inverter technology, current control, high quality, stable performance;
- Closed feedback circuit, invariable voltage output, great ability of balance voltage up to $\pm 15\%$;
- Electron reactor control, stable welding, little splash, deep molten pool, excellent welding bead shaping;
- Welding voltage can be preset, and the voltmeter displays the preset voltage value when not welding.
- Both welding current and welding voltage can be observed at the same time.
- Slow wire feeding during arc starting, remove the melting ball after welding , reliable arc starting;
- Small-sized, light-weighted, easy to operate, economical, practical.

Operating environment

Adequate ventilation is required to provide proper cooling for the machine. Ensure that the machine is placed on a stable level surface where clean cool air can easily flow through the unit. The machine has electrical components and control circuit boards which will be damaged by excessive dust and dirt, so a clean operating environment is essential

Block Diagram



3. MAIN PARAMETER

MODEL	MIG-120		
Power Supply Voltage(V)	240±10%		
Function	MIG		
Duty Cycle (40℃ 10min) (40℃ 10min)	15%	60%	100%
	120A	60A	46.5A
No Load Voltage(V)	60		
Rated Input Capacity(KVA)	5.36		
Rated Input Current(A)	22A/8.52A		
Output CurrentRange(A)	30-120A		
Efficiency%	82		
Power Factor	0.64		
Function	LIFT TIG		
Duty Cycle (40℃ 10min) (40℃ 10min)	15%	60%	100%
	120A	60A	46.5A
No Load Voltage(V)	25		
Rated Input Capacity(KVA)	3.56		
Rated Input Current(A)	15.9A/6.2A		
Output CurrentRange(A)	15-120A		
Efficiency%	78.4		
Power Factor	0.63		
Function	MMA		
Duty Cycle (40℃ 10min) (40℃ 10min)	15%	60%	100%
	120A	60A	46.5A
No Load Voltage(V)	60		
Rated Input Capacity(KVA)	5.15		
Rated Input Current(A)	24A/9.3A		
Output CurrentRange(A)	15-120A		
Efficiency%	81.5		
Power Factor%	0.61		
IP	21S		
Insulation Class	H		
Cooling Way	FAN & AIR		
Dimension(L*W*H)(mm)	380X240X245		
Wire Diameter(mm)	0.8-0.9		
Net Weight(Kg)	4		

Note: The welding duty cycle is the percentage of actual continuous welding time that can occur in a ten minute cycle. For example: 20% at 125amps- this means the welder can weld continuously at 130 amps for 2 minutes and then the unit will need to be rested for 8 minutes.

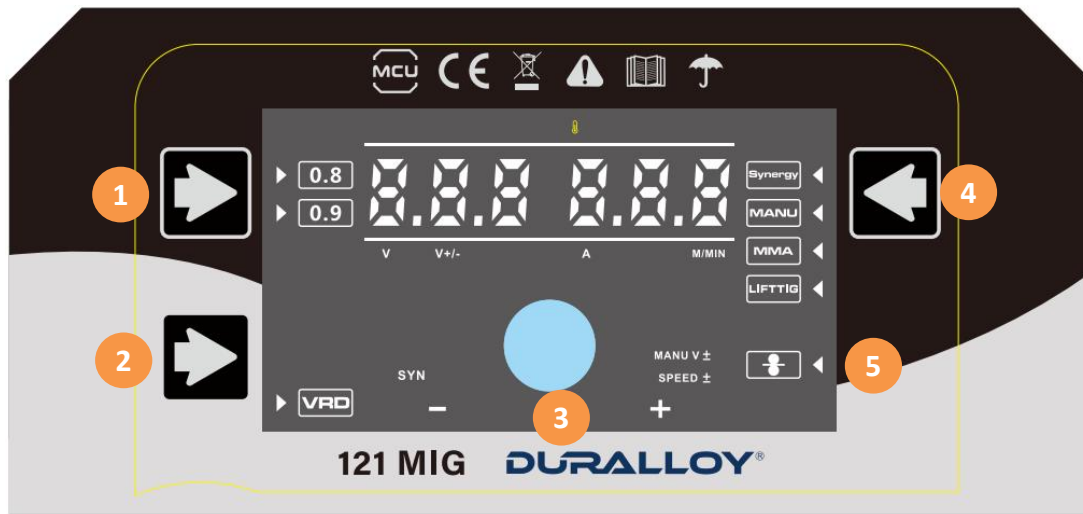
The duty cycle can be affected by the environment in which the welder is used. In areas with temperatures exceeding 40℃, the duty cycle will be less than stated. In areas less than 40℃, higher duty cycles have been obtained

All tests on duty cycles have been carried out at 40℃, so in practical working conditions the duty cycles will be much greater than those stated above.

4. Structure of welder

4.1 Panel Display structure & operation LED

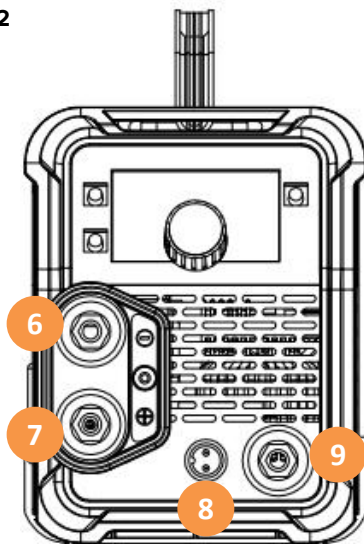
Figure 1



- 1、 Button - Select wire diameter
- 2、 Button- to select VRD Function
- 3、 Knob -adjust Fine Voltage/Welding Current & Voltage/ Wire feed speed
- 4、 Button- to select welding mode Synergy/MANU/MMA/LIFT TIG
- 5、 Block wire feed display

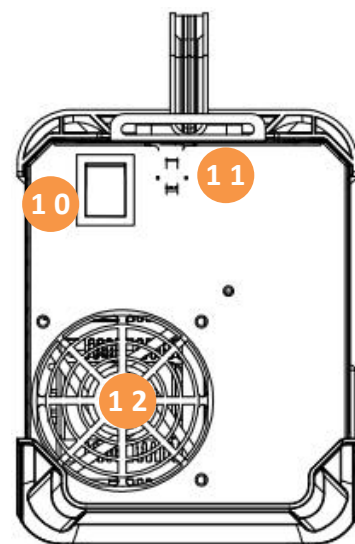
4.2 Front & back Panel structure

Figure 2



- 6、 Manual welding negative output terminal
- 7、 Direct Connect MIG Torch
- 8、 Gun switch interface
- 9、 Positive (+) Output Terminal

Figure 3

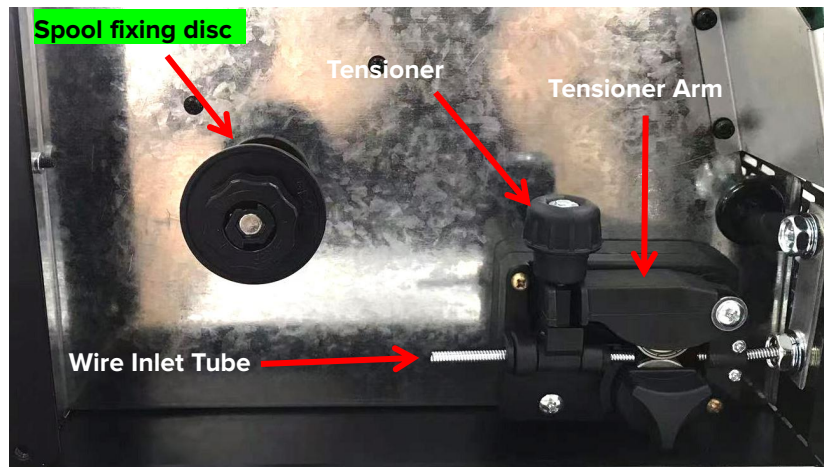


- 10、 Power Switch
- 11、 power cable
- 12、 Fan

5. INSTALLATION

5.1. MIG Welding Set Up & Operation MIG

5.1.1 Fitting the wire spool & Wire feeder Tension Adjustment



- Open the door of the Welder and remove the wire retaining disc.
- Slide the Wire Spool onto the center of the Spindle. When doing so, Make sure the drive disc of the spindle is engaged with a spoke of the wire Spool.
- Reinstall the retainer disc



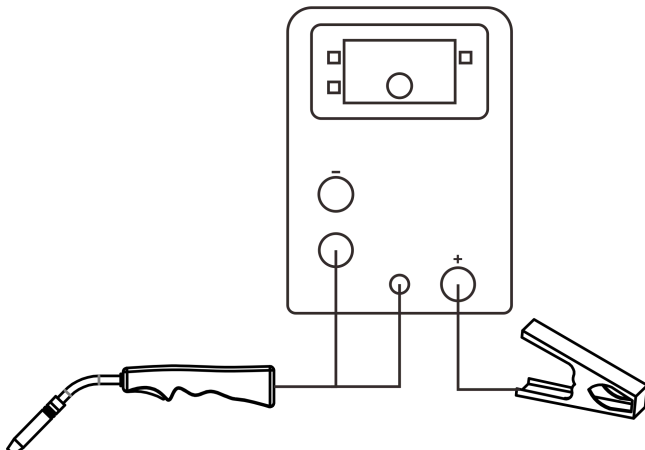
Warning! - Before changing the feed roller or wire spool, ensure that the mains power is switched off



Warning! - The use of excessive feed tension will cause rapid and premature wear of the drive roller, the support bearing and the drive motor.

5.1.2 setup for gasless MIG welding operation

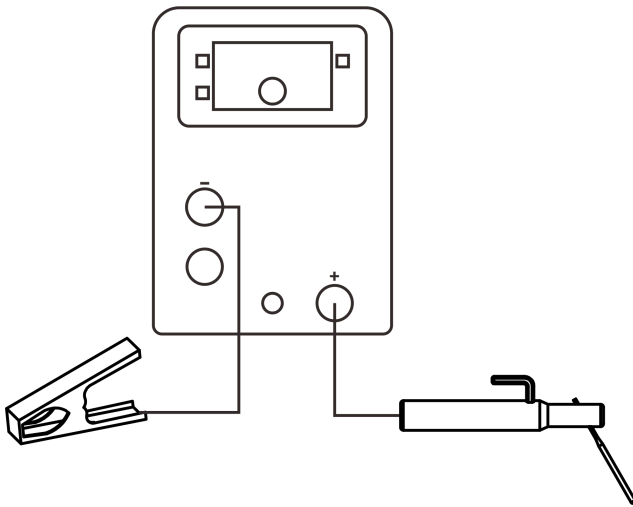
Note : Please operate and refer "4. STRUCTURE OF WELDER" on Page 5



- Check that the correct flux cored, gasless wire, matching drive roller and welding tip are fitted
- Connect Earth Lead Quick Connector to the positive (+) output welding terminal .
- Connect Earth Clamp to the work piece. Contact with work-piece must be strong contact with clean, bare metal, with no corrosion, paint or scale at the contact point.

Basic welding guide**5.1.3 Setup for MMA/STICK mode operation**

Note : Please operate and refer "4.STRUCTURE OF WELDER "on Page5



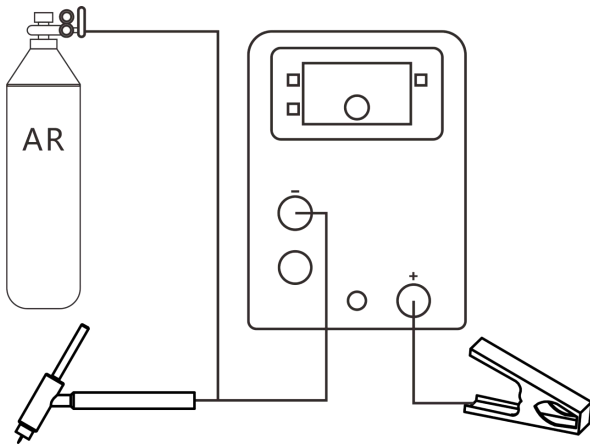
- Connect Electrode holder Quick Connector to the positive (+) welding output terminal
- Connect Earth Lead Quick Connector to the negative (-) output welding terminal See picture below



Warning! - MMA/Stick Welding requires an MMA lead set.

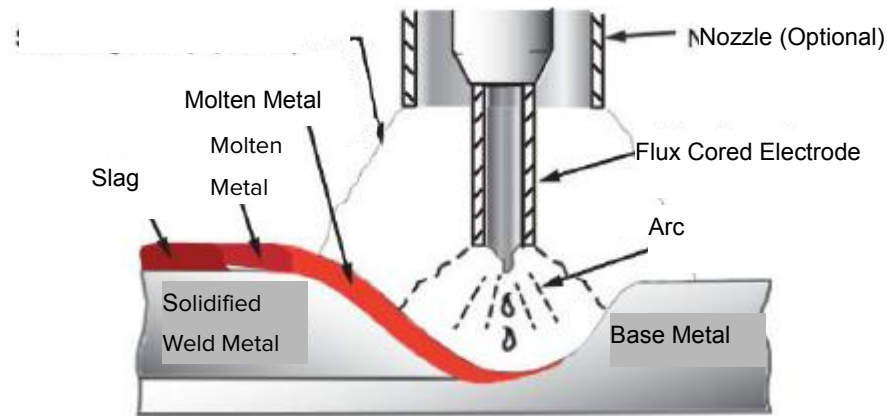
5.1.4 Setup for Lift TIG welding operation

Note : Please operate and refer "4.STRUCTURE OF WELDER "on Page5



- Connect Lift TIG torch Quick Connector to the negative (-) output welding terminal
- Connect Earth Lead Quick Connector to the positive (+) welding output terminal
- Connect the air hose of Lift tig torch with the Argon meter connector. See picture below

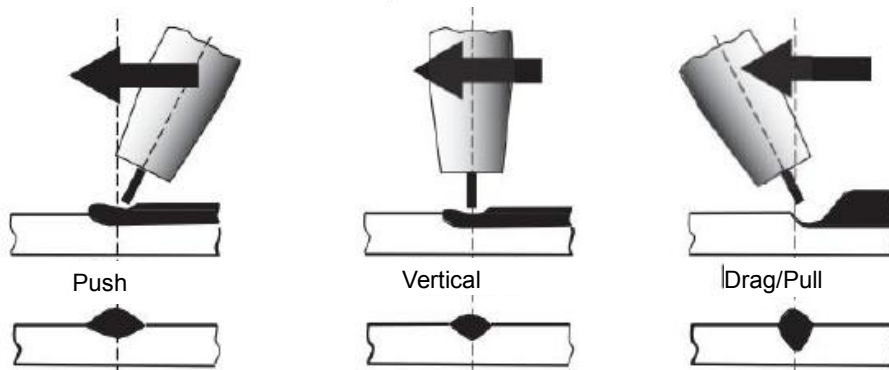
FLUX CORED ARC WELDING (FCAW): This is an electric arc welding process which fuses together the parts to be welded by heating them with an arc between a continuous flux filled electrode wire and the work-piece. Shielding is obtained through decomposition of the flux within the tubular wire. The process is normally applied semi automatically; however the process may be applied automatically or by machine. It is commonly used to weld large diameter electrodes in the flat and horizontal position and small electrode diameters in all positions. The process is used to a lesser degree for welding stainless steel and for overlay work.



FCAW Process

Position of MIG Torch

The angle of MIG torch to the weld has an effect on the width of the weld



The welding gun should be held at an angle to the weld joint. (See Secondary Adjustment Variables below) Hold the gun so that the welding seam is viewed at all times. Always wear the welding helmet with proper filter lenses and use the proper safety equipment.

CAUTION

Do not pull the welding gun back when the arc is established. This will create excessive wire extension (stick-out) and make a very poor weld.

The electrode wire is not energized until the gun trigger switch is depressed. The wire may therefore be placed on the seam or joint prior to lowering the helmet.

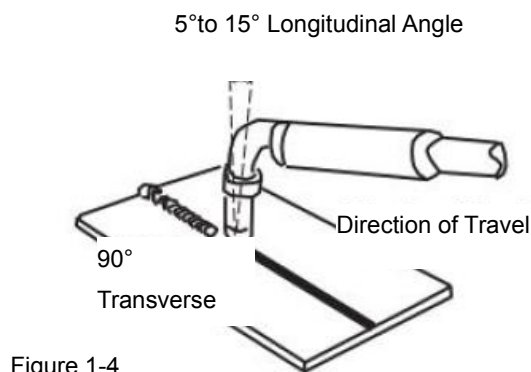


Figure 1-4

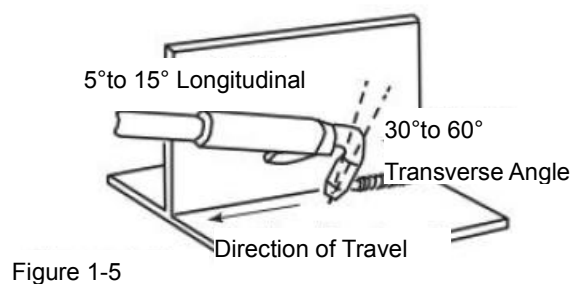
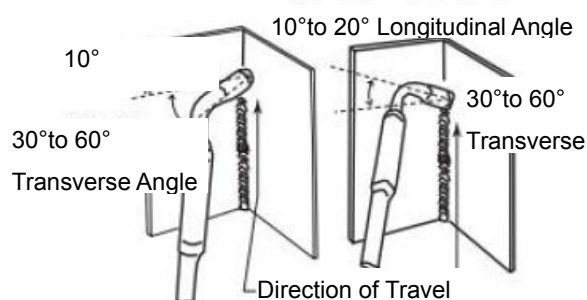


Figure 1-5



Vertical Fillet Welds

Figure 1-6

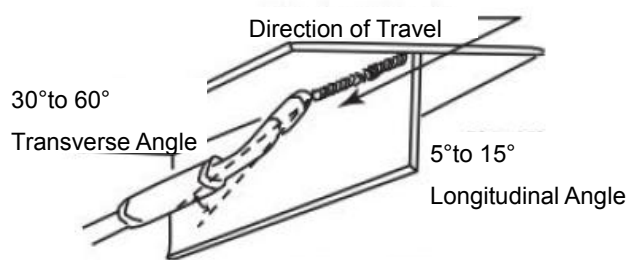


Figure 1-7

The electrode wire stick out from the MIG Torch nozzle should be between 10mm to 20.0mm. This distance may vary depending on the type of joint that is being welded

Travel Speed

The speed at which the molten pool travels influences the width of the weld and penetration of the welding run

Preselected Variables

Preselected variables depend upon the type of material being welded, the thickness of the material, the welding position, the deposition rate and the mechanical properties. These variables are:

Type of electrode wire

Size of electrode wire

Primary Adjustable Variables

These control the process after preselected variables have been found. They control the penetration, bead width, bead height, arc stability, deposition rate and weld soundness. They are:

Arc Voltage

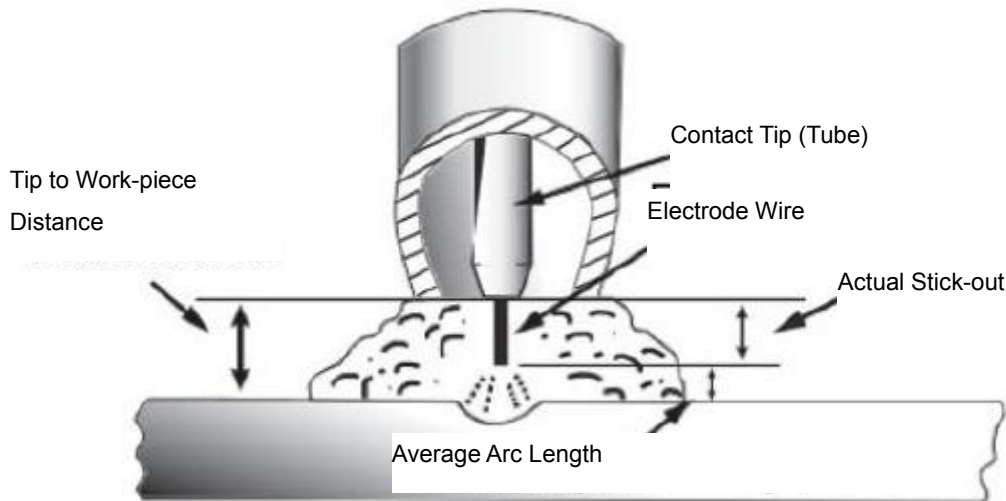
Welding current (wire feed speed)

Travel speed

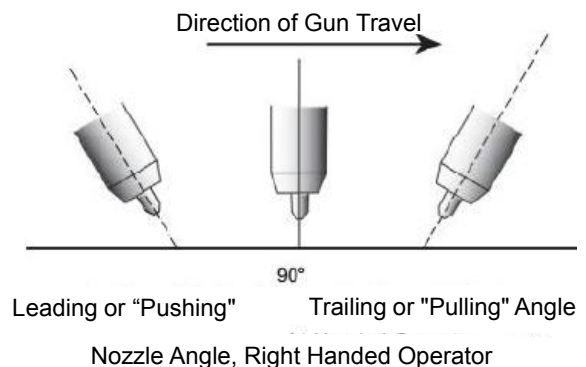
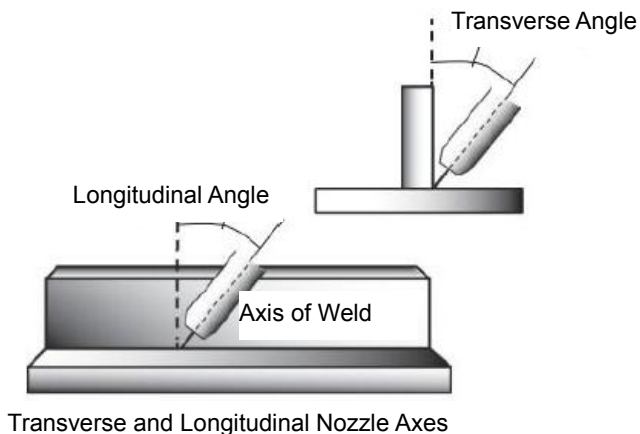
Secondary Adjustable Variables

These variables cause changes in primary adjustable variables which in turn cause the desired change in the bead formation. They are:

1. Stick-out (distance between the end of the contact tube (tip) and the end of the electrode wire). Maintain at about 10mm stick-out
2. Wire Feed Speed. Increase in wire feed speed increases weld current, Decrease in wire feed speed decreases weld current



3. Nozzle Angle. This refers to the position of the welding gun in relation to the joint. The transverse angle is usually one half the included angle between plates forming the joint. The longitudinal angle is the angle between the centre line of the welding gun and a line perpendicular to the axis of the weld. The longitudinal angle is generally called the Nozzle Angle and can be either trailing (pulling) or leading (pushing). Whether the operator is left handed or right handed has to be considered to realize the effects of each angle in relation to the direction of travel.



Establishing the Arc and Making Weld Beads

Before attempting to weld on a finished piece of work, it is recommended that practice welds be made on a sample metal of the same material as that of the finished piece

The easiest welding procedure for the beginner to experiment with MIG welding is the flat position. The equipment is capable of flat, vertical and overhead positions.

For practicing MIG welding, secure some pieces of 16 or 18 gauge (0.06" 1.5mm or 0.08" 2.0mm) mild steel plate 6" x 6" (150 x 150mm). Use 0.030" (0.8mm) flux cored gasless wire .

Setting of the Power Source

Power source and Wirefeeder setting requires some practice by the operator, as the welding plant has two control settings that have to balance. These are the Wirespeed control and the welding Voltage Control. The welding current is determined by the Wirespeed control, the current will increase with increase Wirespeed, resulting in a shorter arc. Less wire speed will reduce the current and lengthen. Increasing the welding voltage hardly alters the current level, but lengthens the arc. By decreasing voltage, a shorter arc is obtained with a little change in current level.

When changing to a different electrode wire diameter, different control settings are required. A thinner electrode wire needs more Wirespeed to achieve the same current level.

A satisfactory weld cannot be obtained if the Wirespeed and Voltage settings are not adjusted to suit the electrode wire diameter and the dimensions of the work piece.

If the Wirespeed is too high for the welding voltage, "stubbing" will occur as the wire dips into the molten pool and does not melt. Welding in these conditions normally produces a poor weld due to lack of fusion. If, however, the welding voltage is too high, large drops will form on the end of the wire, causing spatter. The correct setting of voltage and wirespeed can be seen in the shape of the weld deposit and heard by a smooth regular arc sound.

Electrode Wire Size Selection

The choice of Electrode wire size used depends on the following

Thickness of the metal to be welded

Capacity of the wire feed unit and Power Source

The amount of penetration required

The deposition rate required

The bead profile desired

The position of welding

Cost of the wire

6. CAUTION

1. Working environment

- (1) Welding should be carried out in a relatively dry environment with its humidity of 90% or less.
- (2) The temperature of the working environment should be within -10°C to 40°C.
- (3) Avoid welding in the open air unless sheltered from sunlight and rain, and never let rain or water infiltrate the machine.
- (4) Avoid welding in dusty area or environment with corrosive chemical gas.

2. Safety tips

Over- overheating protection circuit is installed in this welding machine. If the overheating generated inside this welding machine, this welding machine will stop automatically. However, inappropriate use will still lead to machine damage, so please note:

(1) Ventilation

High current passes when welding is carried out, thus natural ventilation cannot satisfy the welding machine's cooling requirement. Maintain good ventilation of the louvers of this welding machine. The minimum distance between this welding machine and any other objects in or near the working area should be 30cm. Good ventilation is of critical importance for the normal performance and service life of this welding machine.

(2) No over-load.

Over-load current could obviously shorten the welding equipment's life, or even damage the machine.

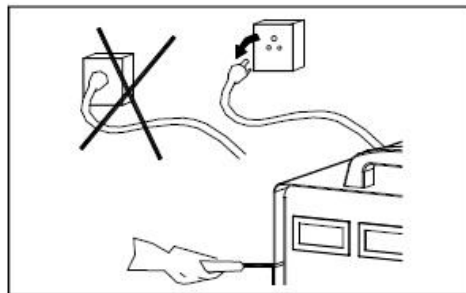
A sudden halt may occur while the welding operation is carried out while this welding machine is of over-load status. Under this circumstance, it is unnecessary to restart this welding machine. Keep the built-in fan working to bring down the temperature inside the welding machine.

(3) Avoid electric shock.

An earth terminal is available for this welding equipment. Connect it with the earth cable to avoid the static and electric shock.

7. MAINTENANCE

1. Disconnect input plug or power before maintenance or repair on machine.
2. Be sure input ground wire is properly connect to a ground terminal.
3. Check whether the inner electricity connection is well (esp. the plugs), and tighten the loose connection; if there is oxidization, remove it with sand paper and then re-connect.



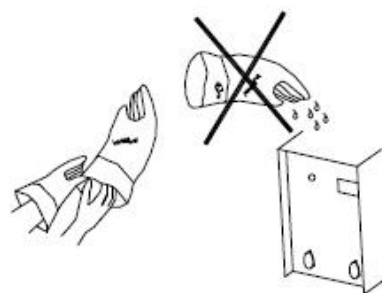
4. Keep hands, hair, loose clothing, and tools away from electrical parts such as fans, wires when the machine is switched on.



5. Clear the dust at regular intervals with clean and dry compressed air; if the working condition is with heavy smoke and air pollution, the welding machine should be cleaned daily.
6. The compressed air should be reduced to the required pressure lest the little parts in the welding machine be damaged.



7. To avoid water and rain, if there is, dry it in time, and check the insulation with mega-meter (including that between the connection and that between the case and the connection). Only when there is no abnormal phenomenon should the welding continue.
8. If the machine is not used for a long time, put it into the original packing in dry condition.



8. DAILY CHECKING

To make best use of the machine, daily checking is very important. During the daily checking, please check in the order of torch, wire-feeding vehicle, all kinds of PCB, and so on. Remove the dust or replace some parts if necessary. To maintain the purity of the machine, please use original welding parts.

Cautions : Only the qualified technicians are authorized to undertake the repair and check task of this welding equipment in case of machine fault.

8.1. Power supply

Part	Check	Remarks
Control panel	1.Operation, replacement and installation of Switch.	
	2.Switch on the power, and check if the power indicator is on.	
Fan	1.Check if the fan is functioning and the sound generated is normal.	If the fan doesn't work or the sound is abnormal, do inner check.
Power supply	1. Switch on the power supply, and check if abnormal vibration, heating of the case of this equipment, variation of colors of case or buzz presents.	

8.2. Welding torch

Part	Check	Remarks
Nozzle	2.Check if there is spatter sticking on the nozzle.	Spatter possibly leads to the damage of torch. Use anti-spatter to eliminate the spatter.
Contact tip	1.Check if the contact tip is fixed firmly.	Unfixed contract tip possibly leads to unstable arc.
	2.Check if the contact tip is physically complete.	The physically incomplete contact tip possibly leads to unstable arc and arc automatically terminating.
Wire feeding hose	1.Make sure that there is the agreement of wire and wire feed tube.	Disagreement of the diameters of wire and wire feed tube possibly leads to the unstable arc. Replace it/them if necessary.
	2.Make sure that there is no bending or elongation of wire feed tube.	Bending and elongation of wire feed tube possibly leads to the unstable wire feed and arc. Replace it if necessary.
	3.Make sure that there is no dust or spatter accumulated inside the wire feed tube, which makes the wire feed tub blocked.	If there is dust or spatter, remove it.

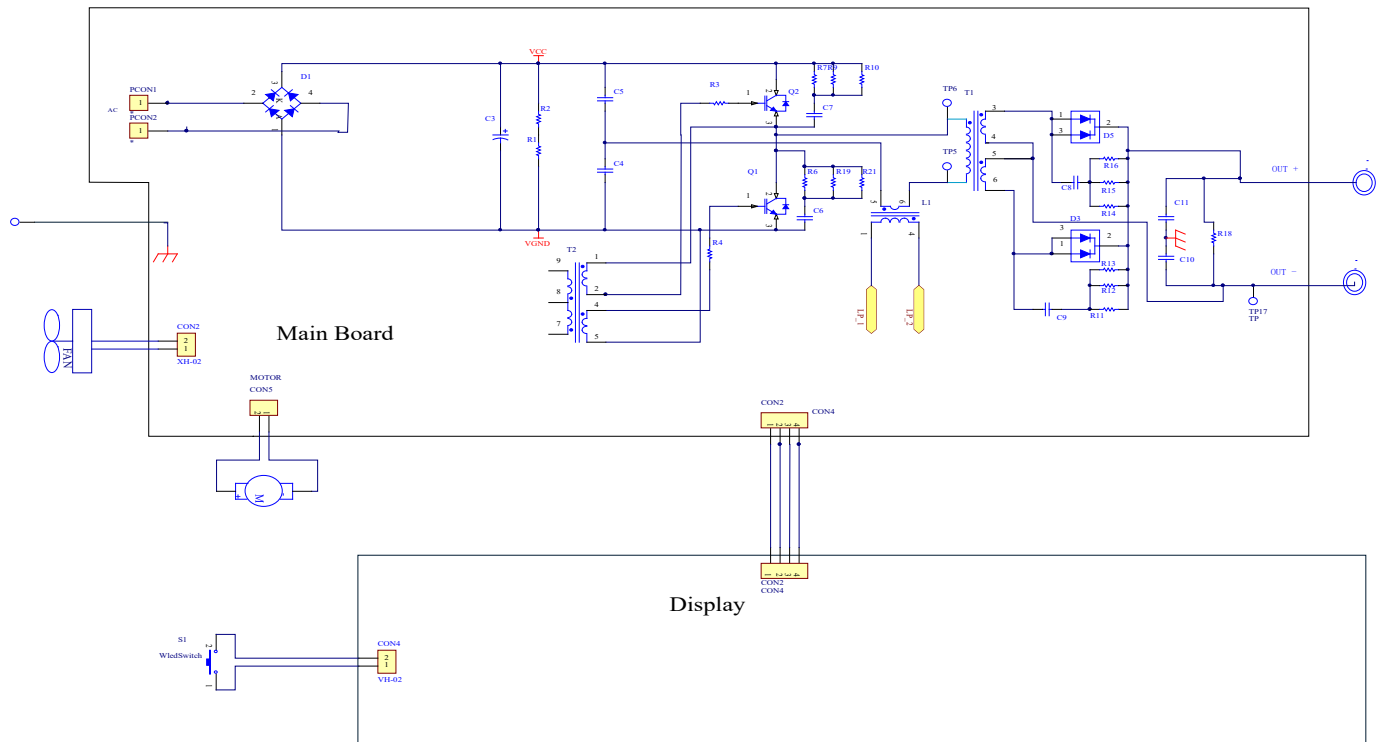
8.3. Wire feeder

Part	Check	Remarks
Pressure adjusting handle	1.Check if the pressure-adjusting handle is fixed and adjusted to the desired position.	The unfixed pressure-adjusting handle leads to the unstable welding output.
Wire-feeding hose	1.Check if there is dust or spatter inside the hose or beside wire-feeding wheel.	Remove the dust.
	2.Check if there is a diameter agreement of wire and wire-feeding hose.	Non-agreement of the diameter of wire and wire-feeding hose possibly leads to the excessive spatter and unstable arc.
	3.Check if rod and wire feeding groove are concentric.	Unstable arc possibly occurs.
Wire-feeding wheel	1.Check if there is an agreement of wire diameter and wire-feeding wheel.	Non-agreement of wire diameter and wire-feeding wheel possibly leads to the excessive spatter and unstable arc.
	2.Check if the wire groove is blocked.	Replace it if necessary.
Pressure adjusting wheel	1.Check if the pressure adjusting wheel can rotate smoothly, and it's physically complete.	Unstable rotation or physically incompleteness of the wheel possibly leads to unstable wire feeding and arc.

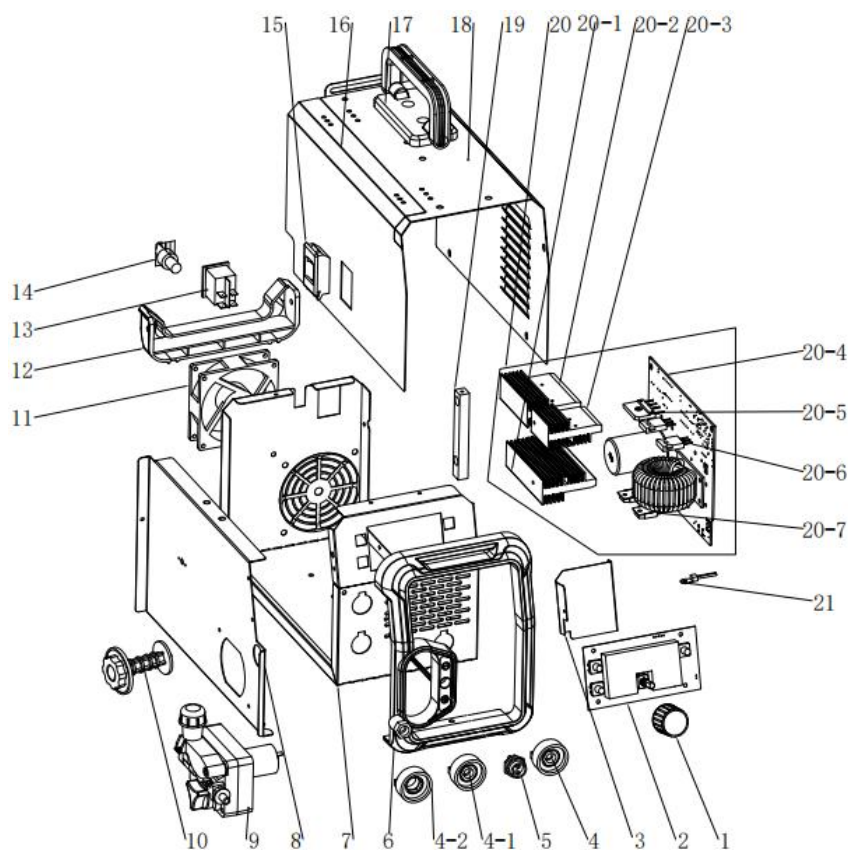
8.4. Cables

Part	Check	Remarks
Torch cable	1.Check if the cable of torch is twisted	The twisted torch cable leads to unstable wire feeding and arc.
	2.Check if the coupling plug is in loose connection.	
Output cable	1.Check if the cable is physically complete.	Relevant measures should be taken to obtain stable weld and prevent the possible electric shock.
	2.Check if insulation damage or loose connection exists	
Input cable	1.Check if the cable is physically complete.	
	2.Check if insulation damage or loose connection exists.	
Earth cable	1.Check if the earth cables are well fixed and not short-circuited.	Relevant measures should be taken to prevent the possible electric shock.
	2.Check if this welding equipment is well grounded.	

9. CONNECTION DIAGRAM OF THE MACHINE



10. EXPLOSION DRAWING



NO.	Part name	Consumables	NO.	Part name	Consumables
1	Panel knob		15	Clasp	
2	Control Panel PCB Board	YES	16	Side plate	
3	Panel Protector (Sheet Metal)		17	Haft	
4	European fast sockets		18	Machine Cover	
4-1					
4-2			19	Upright	
5	Gun switch socket 2 cores		20	Movement	YES
6	Front Plastic Panel		20-1	Quick-recovery radiator	
7	Base Panel		20-2	Rectifying radiator	
8	Partition sheet metal		20-3	IGBT radiator IGBT	
9	Wire Feeder Motor		20-4	Main board	YES
10	Wire feed spool		20-5	Rectifier tube	YES
11	Fan	YES	20-6	IGBT	YES
12	After plastic low board		20-7	Fast recovery Diode	YES
13	Power switch		21	Temperature sensor	YES
14	Power connector				

11. Warranty Information.

Duralloy Welding Equipment.

1 year Warranty*

Duralloy Industrial Supply warrants the original retail purchaser that the Duralloy Welding and Cutting machines purchased will be free from defects in materials and workmanship for a period of 1 years* from the date of purchase by the customer. If a defect in material or workmanship becomes evident during this period, Duralloy Industrial Supply will at its option;

- Repair the product (or pay for the repair of the product)
- Replace the product

In case of warranty claim the product should be returned to the original place of purchase, with proof of purchase.

Any handling and transport costs (or other expenses) incurred in claiming warranty are not covered by this warranty. The warranty schedule is:

- Duralloy Power source only* - 1 year
- Duralloy Regulator - 3 months
- MIG Torches- 3 months
- TIG Torches - 3 months
- Plasma Torches- 3 months
- Ancillary Equipment- 3 months

The Obligation of Duralloy Industrial Supply under this warranty is limited to the circumstance set out above and is subject to:

- The customer being able to provide proof of purchase of the relevant equipment.
- A defect in either material or workmanship.
- The customer returning the product to Duralloy Industrial supply or an authorized repair agent.
- The product not having been altered or tampered with.
- The product not having been used outside the normal operating parameters of this equipment.
- The product to be in good condition and not damaged which may cause a fault

All goods come with a guarantee that cannot be excluded under the Australian Consumer laws. You as a consumer are entitled to a replacement or a refund for a major failure .You are also entitled to have the goods repaired or replaced if the products fail to be of acceptable quality:

This Warranty Provided by:

Duralloy Industrial Supply - (ABN - 81 831 839 268)

2 Hollylea Road Leumeah NSW 2560

1300 369 456