



Manual Guide

351 SWF / 505 SWF

3 PHASE MIG WELDER W/ FEEDER



TOPGUNWELDING.COM.AU

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Safety Info

SAFETY INFO AND TIPS

WARNING

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. IF WEARING A PACEMAKER KEEP AWAY UNTIL CONSULTING YOUR DOCTOR. DO NOT LOSE THESE INSTRUCTIONS. READ OPERATING/INSTRUCTION MANUAL BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

Welding products and welding processes can cause serious injury or death, damage to other equipment or property, if the operator does not observe all safety rules and take precautionary measures.

Safe practices are developed from past experience in the use of welding and cutting equipment. These practices must be learnt through study and training before using this equipment. Some of these practices apply to equipment connected to mains power; others apply to engine driven equipment. Anyone not having extensive training in the safe and proper usage of welding and cutting equipment, should not attempt to use this equipment without proper supervision.

Safe practices are outlined in the Australian Standard AS1674.2-2007 entitled: Safety in Welding and Allied processes Part 2: Electrical. This publication and other guides to what you should learn before operating this equipment are listed at the end of these safety precautions. HAVE ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

ELECTRICAL WELDING HAZARDS

Touching live electrical parts or components can potentially cause fatal shocks or severe burns. The electrode and work circuit is a live electrical circuit when the output is connected and machine turned on. The input power circuit and machine internals are also live when power is connected and turned on.

In semi-automatic or automatic wire welding (eg MIG), the wire, wire reel, drive roll housing and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a potential hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers,
4. Disconnect input power or stop engine before installing or servicing this equipment. Lock input power disconnect switch open or remove line fuses so power cannot be turned on accidentally.
5. Properly install and ground this equipment according to its OIM.
6. Turn off all equipment when not in use. Disconnect power to equipment
7. Use fully insulated electrode holders. Never dip the holder in water or any other liquid, to cool it or lay it down on the ground or on the work surface. Do not touch the holders connected to multiple welding machines at the same time or touch other electrical conductors to prevent electric shock.
8. Do not use worn, damaged, undersized or poorly spliced cables.
9. Do not wrap cables around your body.
10. Ground the workpiece to a good electrical (Earth) ground.
11. Do not touch electrode while in contact with the work (Ground) circuit.
12. Use only well maintained equipment. Repair or replace damaged parts at once.
13. In confined spaces or damp locations, do not use a welder with an AC output unless it is equipped with a voltage reduction device. Use equipment with a DC output.
14. Wear safety harness to prevent falling if working above floor level.
15. Keep all panels and covers securely in place.

*PLEASE NOTE THAT ANY MODIFICATION TO THE OPERATION OF THE MACHINE IN ANY PART SMALL OR LARGE MAY INCREASE THE RISK OF HARM OR SAFE OPERATION AND VOID WARRANTY.

SAFETY PRECAUTIONS

FOLLOW THE BELOW PRECAUTIONS CAREFULLY. IMPROPER USE OF ANY WELDER MAY RESULT IN SERIOUS INJURY OR DEATH.

1. **ONLY CONNECT WELDER TO A POWER SOURCE FOR WHICH IT IS DESIGNED.**
The specification plate on the welder lists this information. When welding outdoors, only use an extension cord which is designed for outdoor use.
2. **ONLY OPERATE WELDER IN DRY LOCATIONS AND ON A STABLE WORK SURFACE (IE: CONCRETE OR MASONRY FLOOR)**
Keep the area clean and uncluttered.
3. **KEEP ALL COMBUSTIBLES AWAY FROM THE WORK AREA.**
4. **DO NOT WEAR CLOTHING THAT HAS BEEN CONTAMINATED WITH GREASE, OIL OR FLAMMABLE LIQUIDS.**
5. **KEEP CABLES DRY AND FREE FROM OIL AND GREASE AND NEVER COIL AROUND SHOULDERS.**
6. **SECURE WORK WITH CLAMPS OR OTHER MEANS. Do not over-reach when working.**
7. **NEVER STRIKE AN ARC ON A COMPRESSED GAS CYLINDER.**
8. **DON'T LET THE INSULATED PORTION OF THE ELECTRODE HOLDER/TORCH TOUCH THE WELDING GROUND WHILST CURRENT IS FLOWING.**
9. **SHUT OFF POWER AND UNPLUG MACHINE WHEN REPAIRING OR ADJUSTING.** Inspect before every use. Only use an appropriate part provided by an authorized Service agent/Distributor.
10. **FOLLOW ALL MANUFACTURERS RULES ON OPERATING SWITCHES AND MAKING ADJUSTMENTS.**
11. **ALWAYS WEAR PROTECTIVE CLOTHING WHEN WELDING/GRINDING.** This includes: Long sleeved shirt (leather sleeves), a protective apron with no pockets, long protective pants and suitable footwear (ie: steel toe boots) When handling hot materials, wear suitably insulated gloves.
12. **ALWAYS WEAR A WELDING HELMET WITH PROTECTIVE LENSES WHEN WELDING.** Arc rays may cause blindness. Wear a protective cap beneath the helmet.
13. **WHEN WELDING OVERHEAD, BEWARE OF HOT METAL DROPPINGS.** Always protect the head, hands, feet and body.
14. **KEEP A FIRE EXTINGUISHER CLOSE BY AT ALL TIMES.**
15. **DO NOT EXCEED THE DUTY CYCLE OF THE MACHINE.** The rated duty cycle of the machine is the percentage of a ten minute period that the machine can be safely operated at a given output (amps) setting.
16. **KEEP CHILDREN AWAY FROM WORK AREA.** Ensure that when not in use, equipment is out of reach of children.
17. **GUARD AGAINST ELECTRIC SHOCK.** Do not work or operate when tired or under the influence of drugs and or alcohol. Do not let the body come into contact with grounded surfaces.

***PLEASE NOTE THAT ANY MODIFICATION TO THE OPERATION OF THE MACHINE IN ANY PART SMALL OR LARGE MAY INCREASE THE RISK OF HARM OR SAFE OPERATION AND VOID WARRANTY.**

ARC RAYS

ARC RAYS can burn eyes and skin; NOISE can damage hearing. ARC RAYS from the welding process produce an intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

1. Use a Welding Helmet or Welding Face Shield fitted with proper shade or filter for the application, to protect your face and eyes when welding or watching someone else weld.
2. Wear approved safety glasses. Side shields recommended.
3. Use protective screens and/or barriers, to protect others from flash and glare and warn others not to watch the arc.
4. Wear protective clothing made from durable, flame resistant material (eg: wool and leather) and appropriate foot protection.
5. Use approved ear plugs or ear muffs if the noise level is high.
6. Never wear contact lenses while welding.

FUMES AND GASES

FUMES and GASES can be hazardous to your health and Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the path of fumes as best you can. Do not breathe the fumes if it can be avoided.
2. If inside, ventilate the area and/or use exhaust at or as close to the arc as possible to remove the welding fumes/gases.
3. If ventilation is poor, use an approved air supplied or filtered respirator.
4. Read the Material Safety Data Sheets (MSDS's) and the manufacturer's instruction for metals, consumables, coatings and cleaners.
5. Work in confined space only if it is well ventilated, or while wearing an air supplied or filtered respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near flammable liquids (eg. degreaser, paint, aerosol storage or cleaning chemicals), as the heat and rays of the arc could react with vapours to form highly toxic and irritating or flammable gases.
7. Do not weld on coated metals, such as galvanized, lead or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated and if necessary, while wearing an air supplied or filtered respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.
8. Protect yourself and others from flying sparks and hot metal.
9. Do not weld where flying sparks can strike flammable material.
10. Remove all flammables within a 35ft (10.7m) of the welding arc. If this is not possible, tightly cover them with an approved containment method.

FIRE & EXPLOSIONS

The WELDING operation can potentially cause fire or an explosion as Sparks and spatter are emitted from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece and hot equipment have potential to cause fires and burns. Accidental contact of the wire or electrode to grounded metal objects may cause sparks, overheating or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35ft (10.7m) of the welding arc. If this is not possible, tightly cover them with an approved containment method.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulk-head or partition can cause a fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect the work cable to the workpiece as close to the welding area as practical, to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.

SPARKS AND HOT METAL

Chipping and grinding can cause flying metal. As welds cool, they can throw off slag.

1. Wear an approved face shield, safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.

CYLINDERS

Cylinders can explode if damaged. Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by securing them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep the protective cap in place over the valve except when the cylinder is in use or connected for use.

PROLOGUE

THANKYOU FOR CHOOSING A TOPGUN WELDING AUSTRALIA PRODUCT

PLEASE READ AND UNDERSTAND THIS MANUAL BEFORE OPERATING THE WELDING PLANT.

PLEASE ONLY USE AUTHORIZED ACCESSORIES AND CHECK FOR CORRECT FITMENT BEFORE USE.

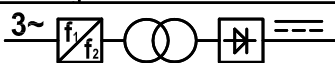







PLEASE DO NOT MODIFY MACHINE IN ANY MANNER AS THIS MAY VOID WARRANTY AND INCREASE CHANCES OF SERIOUS INJURY OR DEATH.









Specifications

MACHINE SPECS

This information can be found on top of the machine.

	351SWF	505 SWF
Input Voltage (V)	415 A/C	415 A/C
Frequency (Hz)	50 -60 Hz	50 -60 Hz
Output Current Range (A)	50 -350 A	40 -500 A
Rated Duty Cycle (%)	60% @ 350A	60% @ 500A
	100% @ 271A	100% @ 400A
Wire Sizes	0.6 -1.6mm	0.6mm -1.6mm
Machine Weight	(Assembled) 90 Kg	(Assembled) 90 Kg
Machine Dimensions (mm)	(Assembled) 345x245x155	(Assembled) 345x245x155
Warranty	3 Years	

INVERTER DC MIG WELDER				
MULTIMIG 351F SYN				
PART NO.		TGWMIG351F		
STANDARD		EN60974-1:2012		
				
	40A/16V-350A/31.5V			
	X	60%		100%
	I ₂	350A		275A
	U ₂	31.5V		27.8V
U ₀ =67V	U ₁ =415V	I _{1max} = 19A		I _{1eff} =15A
	10A/10.4V-350A/24V			
	X	60%		100%
	I ₂	350A		275A
	U ₂	24V		21V
U ₀ =14.5V	U ₁ =415V	I _{1max} = 15A		I _{1eff} =12A
	10A/20.4V-350A/34V			
	X	60%		100%
	I ₂	350A		275A
	U ₂	34V		31V
U ₀ =14.5V	U ₁ =415V	I _{1max} =21A		I _{1eff} =16A
 3~50-60Hz		IP23	H	AF 21.5Kg

INVERTER DC MIG WELDER						
MULTIMIG 505F SYN						
PART NO.		TGWMIG505F				
STANDARD		EN60974-1:2012				
						
	40A/16V-500A/39V					
	X	60%	100%			
	I ₂	500A	400A			
	U ₂	39V	34V			
	U ₀ =66V	U ₁ =415V	I _{1max} = 33A	I _{1eff} =27A		
	10A/10.4V-500A/30V					
	X	60%	100%			
	I ₂	500A	400A			
	U ₂	30V	26V			
	U ₀ =14.4V	U ₁ =415V	I _{1max} = 27.5A	I _{1eff} =21A		
	10A/20.4V-500A/40V					
	X	60%	100%			
	I ₂	500A	400A			
	U ₂	40V	36V			
	U ₀ =14.4V	U ₁ =415V	I _{1max} =35A	I _{1eff} =27A		
		3~50-60Hz	IP23	H	AF	30Kg

Getting Started

WELDING 101

MIG/MAG Welding Technique

For those who have not yet done any welding, the simplest way to commence is to run beads on a piece of scrap plate. Use a mild steel plate, around 6mm thick and a 3.2mm electrode.

Clean any paint, loose scale or other contaminants from the plate, and set it firmly on the workbench so that welding can be carried out in the downhand position.

Make sure that the work clamp is making good electrical contact with the work piece, either directly or through the work table.

For light gauge material, always clamp the work lead directly to the job, otherwise a poor circuit may result.

The Welder

Place yourself in a comfortable position before beginning to weld. Get a seat of suitable height and do as much work as possible sitting down comfortably. Don't hold your body tense. A taut attitude of mind and a tense body will soon make you feel tired.

Relax and you will find that the job becomes much easier. You can add much to your peace of mind by wearing a leather apron and gauntlets. You won't be worrying then about being burnt or sparks setting your clothes alight.

Place the work so that the direction of welding is across, rather than to or from your body. The electrode holder lead should be clear of any obstructions so that you can move your arm freely along as the electrode burns down. If the lead is slung over your shoulder, it allows greater freedom of movement and takes a lot of weight off your hand.

Be sure the insulation on your cable and electrode holder is not faulty, otherwise you are risking an electric shock.

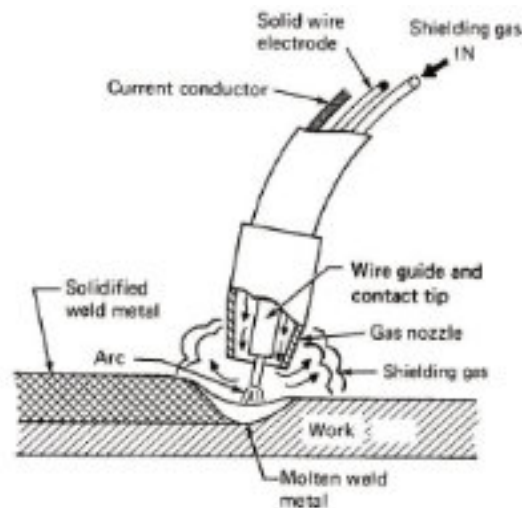
Striking An Arc

Practice this on a piece of scrap plate before going on to more exacting work. The easiest welding procedure for the beginner to experiment with MIG welding is in the flat position. The equipment is capable of flat, vertical and overhead positions.

Two different welding processes are covered in this section (GMAW and FCAW), with the intention of providing the very basic concepts in using the Mig mode of welding, where a welding gun is hand held, and the electrode (welding wire) is fed into a weld puddle, and the arc is shielded by an inert welding grade shielding gas or inert welding grade shielding gas mixture.

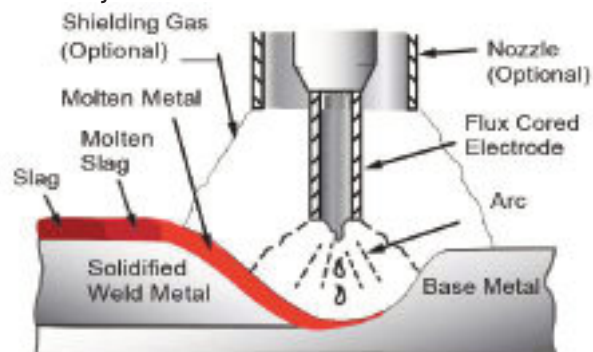
GAS METAL ARC WELDING (GMAW): This process, also known as MIG welding, CO2 welding, Micro Wire Welding, short arc welding, dip transfer welding, wire welding etc., is an electric arc welding process which fuses together the parts to be welded by heating them with an arc between a solid continuous, consumable electrode and the work. Shielding is obtained from an externally supplied welding grade shielding gas or welding grade shielding gas mixture.

The process is normally applied semi-automatically; however the process may be operated automatically and can be machine operated. The process can be used to weld thin and fairly thick steels, and some non-ferrous metals in all positions



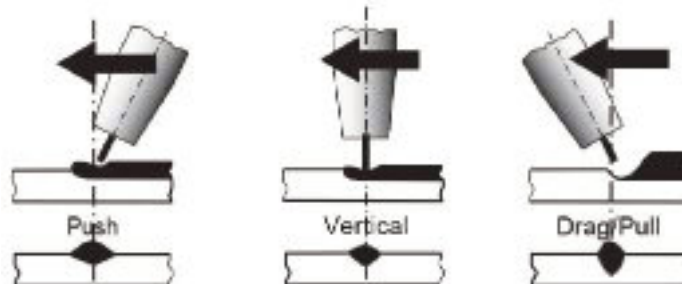
FLUXCORED ARC WELDING (FCAW): This is an electric arc welding process which fuses together the parts to be welded by heating them with an arc between a continuous flux filled electrode wire and the work. Shielding is obtained through decomposition of the flux within the tubular wire. Additional shielding may or may not be obtained from an externally supplied gas or gas mixture.

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.



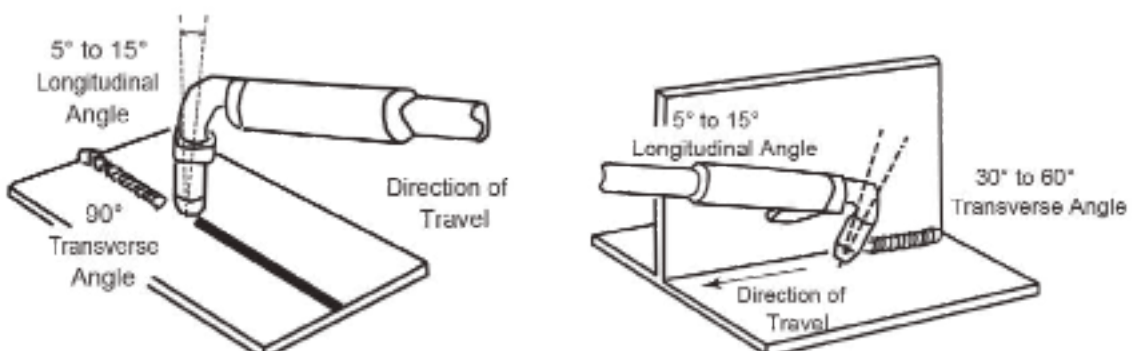
Position of MIG Torch

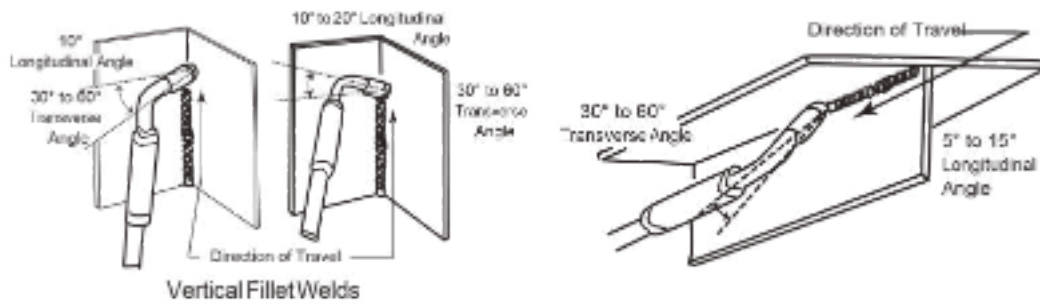
The angle of MIG torch to the weld has an effect on the width of the weld.



The welding gun should be held at an angle to the weld joint. Hold the gun so that the welding seam is viewed at all times. Always wear a welding helmet with the correct shade lenses and proper safety equipment.

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





Distance from the MIG Torch Nozzle to the Work Piece

The electrode wire stick out from the MIG Torch nozzle should be between 10 and 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.

MIG Welding (GMAW) Variables

Most of the welding done by all processes is on carbon steel.

The items below describe the welding variables in short-arc welding of 0.6mm to 6.4mm mild sheet or plate. The applied techniques and end results in the GMAW process are controlled by these variables.

Pre selected Variables

Pre-selected 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
- Type of gas (not applicable to self shielding wires FCAW)
- Gas flow rate (not applicable to self shielding wires FCAW)

Primary Adjustable Variables

These control the process after pre-selected variables have been found. They control the penetration, bead width, bead height, arc stability, deposition rate and weld soundness.

They are:

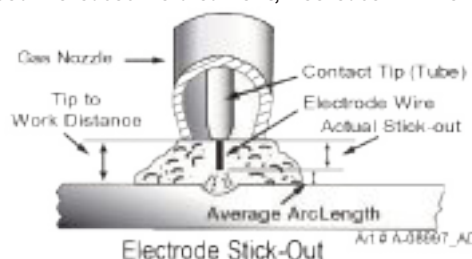
- Arc Voltage
- Welding current (wire feed speed)
- Travel speed

Secondary Adjustable Variables

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

They are:

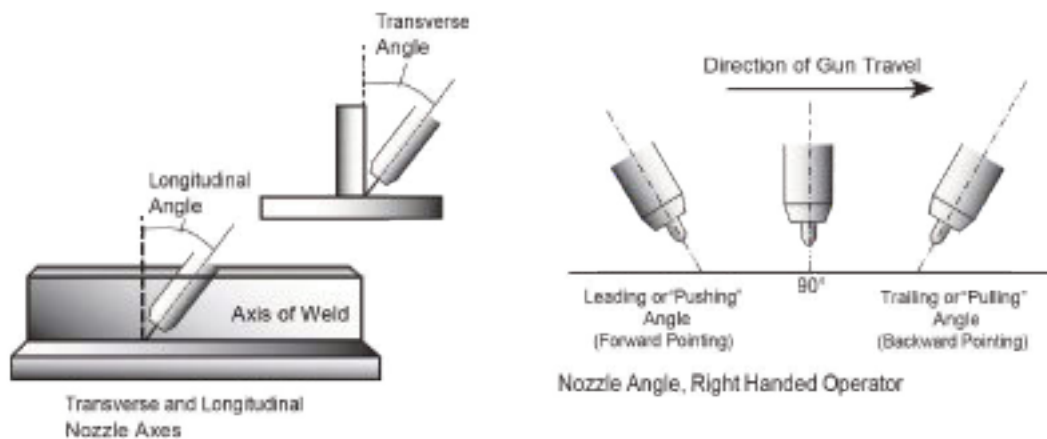
1. Stick-out (distance between the end of the contact tube (tip) and the end of the electrode wire). Maintain at about 10mm stick-out.
2. Wire Feed Speed. Increase in wire feed speed increases weld current, Decrease in wire feed speed decreases weld current.



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 1.5mm or 2.0mm mild steel plate 150 x 150mm. Use 0.8mm flux cored gasless wire or a solid wire with shielding gas.

Setting of the Power

Power source and Wire Feeder settings require some practice by the operator, as the welding plant has two control settings that have to be balanced. These are the Wirespeed control and the welding Voltage Control.

The welding current is determined by the Wirespeed control, the current will increase with increased Wirespeed, resulting in a shorter arc.

Less wire speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the current level, but lengthens the arc.

By decreasing the 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 Wire speed 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 Wire speed 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 and shielding gas used depends on the following

- Thickness of the metal to be welded
- Type of joint
- 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

ARC Welding Technique

A Word to Beginners

For those who have not yet done any welding, the simplest way to commence is to run beads on a piece of scrap plate. Use a mild steel plate, around 6mm thick and a 3.2mm electrode. Clean any paint, loose scale or other contaminants from the plate, and set it firmly on the workbench so that welding can be carried out in the downhand position.

Make sure that the work clamp is making good electrical contact with the work piece, either directly or through the work table. For light gauge material, always clamp the work lead directly to the job, otherwise a poor circuit may result.

The Welder

Place yourself in a comfortable position before beginning to weld. Get a seat of suitable height and do as much work as possible sitting down comfortably. Don't hold your body tense. A taut attitude of mind and a tense body will soon make you feel tired.

Relax and you will find that the job becomes much easier. You can add much to your peace of mind by wearing a leather apron and gauntlets. You won't be worrying then about being burnt or sparks setting your clothes alight.

Place the work so that the direction of welding is across, rather than to or from, your body. The electrode holder lead should be clear of any obstructions so that you can move your arm freely along as the electrode burns down.

If the lead is slung over your shoulder, it allows greater freedom of movement and takes a lot of weight off your hand. Be sure the insulation on your cable and electrode holder is not faulty, otherwise you are risking an electric shock.

Striking an arc

Practice this on a piece of scrap plate before going on to more exacting work. You may at first experience difficulty due to the tip of the electrode "sticking" to the workpiece. This is caused by making too heavy a contact with the work and failing to withdraw the electrode quickly enough. A low amperage will accentuate this. The freezing-on of the tip may be overcome by scratching the electrode along the surface of the workpiece in the same way a match is struck.

As soon as the arc is established, maintain a 1.6mm to 3.2mm gap between the burning electrode end and the parent metal. Draw the electrode slowly along as it melts down.

Another difficulty you may encounter is the tendency that after the arc is "struck", to withdraw the electrode so far that the arc is broken again.

A little practice will remedy both the aforementioned faults.

Arc Length

The securing of an arc length necessary to produce a neat weld, soon becomes almost automatic.

You will find that a long arc produces more heat. A very long arc produces a crackling or spluttering noise and the weld metal comes across in large, irregular blobs. The weld bead is flattened and spatter will increase. A short arc is essential if a high quality weld is to be obtained although if it is too short, there is the danger of it being blanketed by slag and the electrode tip being solidified in.

If this should happen, give the electrode a quick twist back over the weld to detach it. Contact or "touch-weld" electrodes do not stick in this way, and make welding much easier.

Rate of Travel

After the arc is struck, your next concern is to maintain it, and this requires moving the electrode tip towards the molten pool at the same rate as it is melting away. At the same time, the electrode has to move along the plate to form a bead. The electrode is directed at the pool at about 20° from the vertical plane.

The rate of travel has to be adjusted so that a well-formed bead is produced. If the travel is too fast, the bead will be narrow and strung out and may even be broken up into individual globules. If the travel is too slow, the weld metal piles up and the bead will be too large.

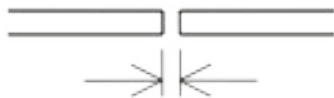
Joint Preparation

In many cases, It will be possible to weld steel sections without any special preparation. For heavier sections and for repair work on castings, etc, it will be necessary to cut or grind an angle between the pieces being joined to ensure proper penetration of the weld metal and to produce structurally sound joints.

In general, surfaces being welded should be clean and free of rust, scale, dirt, grease, etc. Slag should be removed from oxy-cut surfaces. Typical joint designs are shown in Figure 6-10.

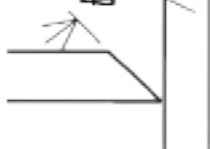
Open Square Butt Joint

Gap varies from 1.6mm (1/16") to 4.8mm (3/16") depending on plate thickness



Single Vee Butt Joint

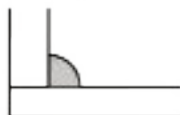
Not less than 45°



Lap Joint



Fillet Joint



Corner Weld

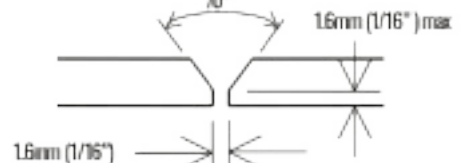


Plug Weld



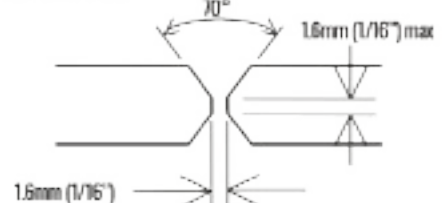
Single Vee Butt Joint

Not less than 70°

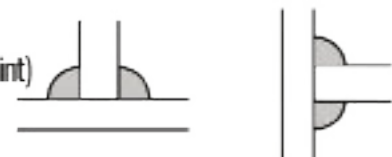


Double Vee Butt Joint

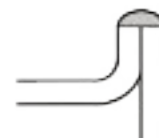
Not less than 70°



Tee Joints (Fillet both sides of the joint)



Edge Joint



Plug Weld



Welding Position

The electrodes dealt with in this manual can be used in most positions, i.e. they are suitable for welding in flat, horizontal, vertical and overhead positions. Numerous applications call for welds to be made in positions intermediate between these

Arc Welding Practice

The techniques used for arc welding are almost identical regardless of what types of metals are being joined. Naturally enough, different types of electrodes would be used for different metals as described in the preceding section.

Main Features & Suitable Range

THE TITAN SERIES OF TOPGUN WELDERS, HAS BEEN DEVELOPED AND MANUFACTURED USING HIGH QUALITY COMPONENTS SOURCED FROM AROUND THE WORLD.

THESE INCLUDE GERMAN SIEMENS IGBT MODULES AND AMERICAN ALLOY MAGNETIC CORE AND DIODE MODULES.

IT HAS BEEN DESIGNED TO BE EASY TO USE, PROVIDE STABLE AND SMOOTH WELDING PERFORMANCE AND BE RELIABLE.

Breakdown of Machine

1.1	MIG	351F/505F	i
	Semi auto welding machine	Maximum Welding Current	Model Improvement

THIS PRODUCT IS COMPRISED OF 3 ITEMS.

The welding machine (power source).

The welding torch.

The earth lead.

1.2 SUITABLE MATERIALS AND RANGES.

Suitable materials -Carbon steel, Stainless steel , Aluminium.

Thickness of materials -1mm+

Suitable positions -All positions.

Suitable wire size: 0.6-1.6mm solid or flux cored wire.

Electrode sizes: 1.0mm -5.0mm.

Tungsten sizes:1.0mm -5.0mm.

1.3 RECOMMENDED CURRENT RANGES.

OUTPUT CURRENT 50-500A

0.6MM—30-100AMP

0.8MM—50-180AMP

0.9MM—60-210AMP

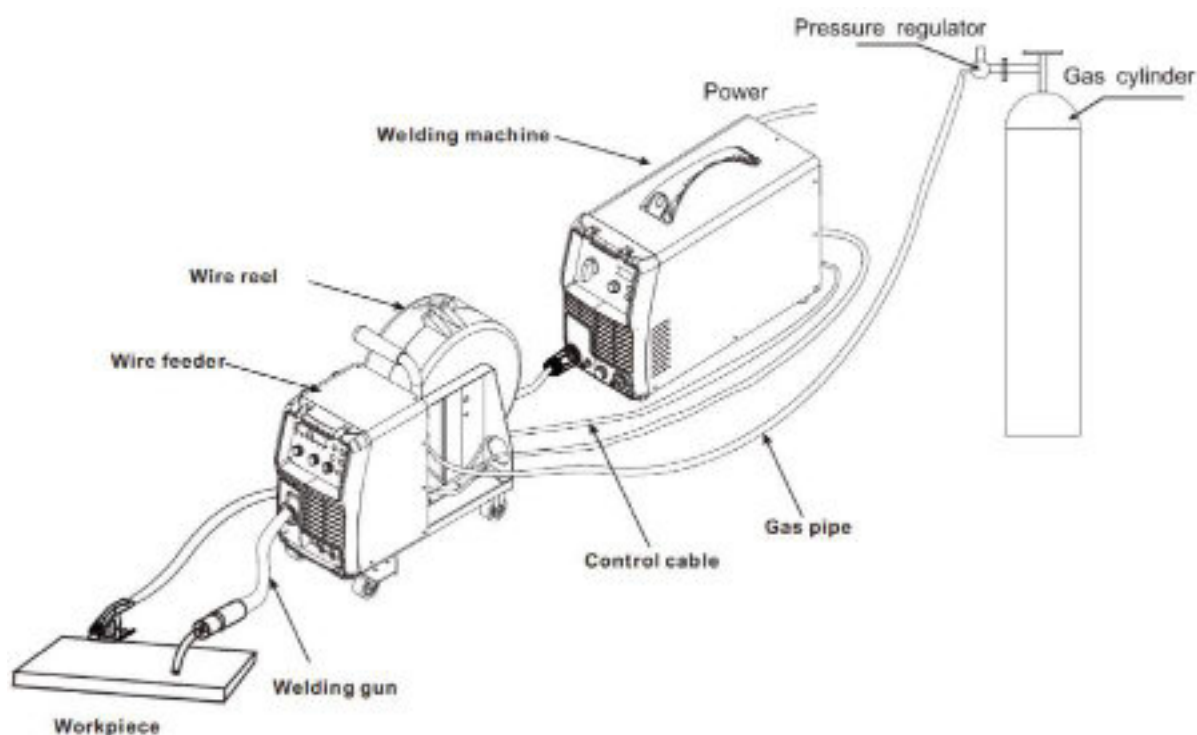
1.0MM—80-250AMP

1.2MM—100-350AMP

1.6MM—120-505AMP

*Maximum wire speed 15m/min

Welding Current (Amps)	Welding Volts (Volts)	Wire Speed				
		0.8mm	0.9mm	1.0mm	1.2mm	1.6mm
60 Amps	15V -17V	3 -4	3 -4	2 -4	-	-
80 Amps	15V -18V	4 -5	3 -5	3 -5	2 -4	-
120 Amps	16V -20V	6 -7	5 -8	4 -7	3 -4	2 -6
160 Amps	17V -21V	10 -12	7 -12	6 -12	4 -9	3 -6
200 Amps	17V -26V	-	11-12	9 -15	6 -11	3 -5
250 Amps	17V -28V	-	-	-	8 -15	4 -6
300 Amps	24V -32V	-	-	-	11-12	6 -7
350 Amps	26V -29V	-	-	-	9 -14	7 -8
400 Amps	28V -31V	-	-	-	-	9 -10
450 Amps	30V -34V	-	-	-	-	10 -12
500Amps	33V -35V	-	-	-	-	12 -14



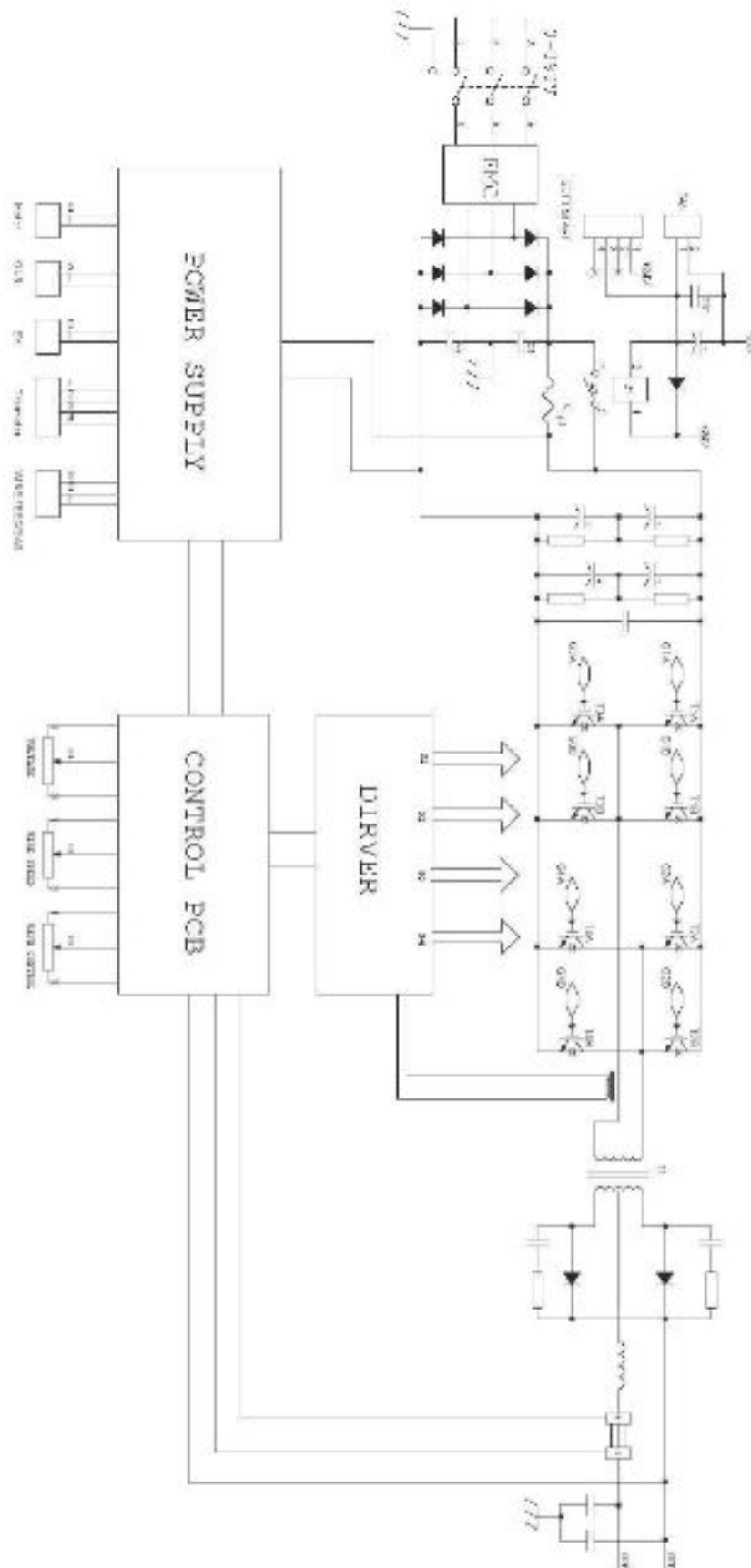
MACHINE SETUP.

1. CONNECT INPUT LEAD TO POWER SOCKET.
2. CONNECT INTERCONNECTING LEADS FROM WIRE FEEDER TO POWER SOURCE.(POSITIVE TO POSITIVE ETC.)
3. CONNECT EARTH LEAD TO POWER SOURCE (AS REQ EITHER +OR -) AND ATTACH TO WORKPIECE OR WORK BENCH
4. CONNECT GAS LINE FROM MACHINE TO REGULATOR AND IF USING CO2 CHECK THAT HEATER IS OPERATIONAL.
5. CONNECT TORCH TO WIRE FEED UNIT BY THE EURO CONNECTION AND TIGHTEN FIRMLY BUT DO NOT OVER TIGHTEN (HAND TIGHT)
6. INSTALL WIRE TO WIRE-FEED UNIT AND CHECK CORRECT ROLLERS INSTALLED
7. CHECK AREA FOR HAZARDS.
8. TURN MAINS POWER ON.
9. TURN WELDING MACHINE ON.
10. SETUP MACHINE SUITABLE FOR APPLICATION.

PLEASE NOTE: OPERATING INSTRUCTIONS ARE ON PAGE

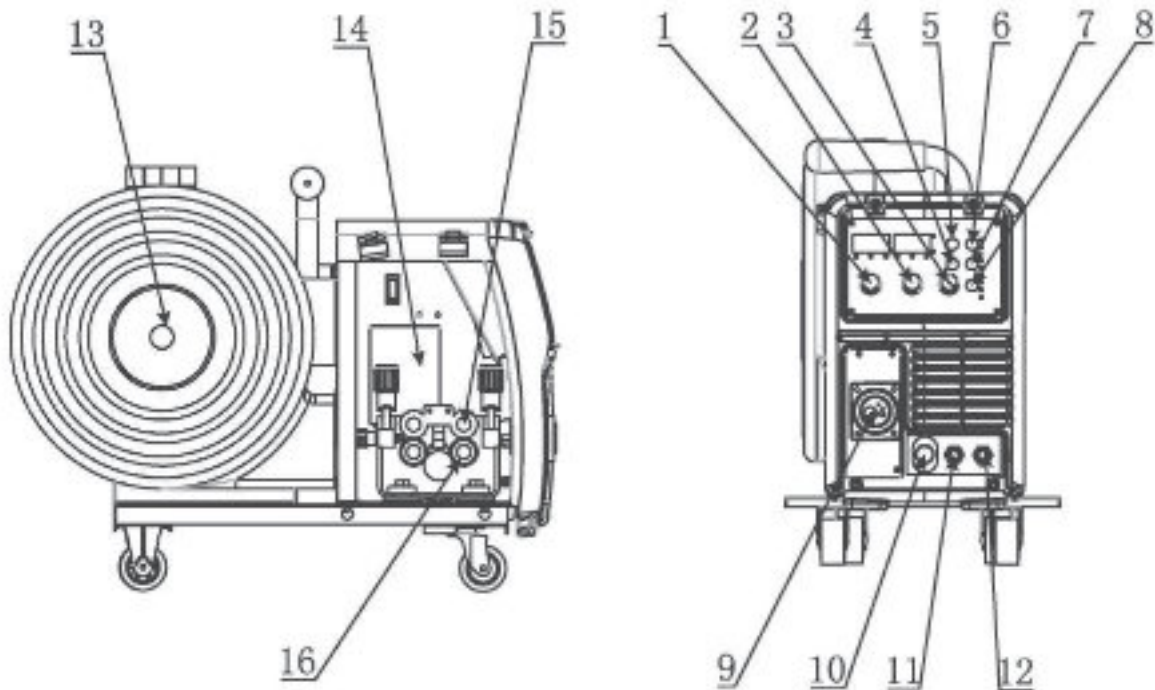
Basic Wiring Diagram

Power Source



Wirefeeder

Controls and Functions



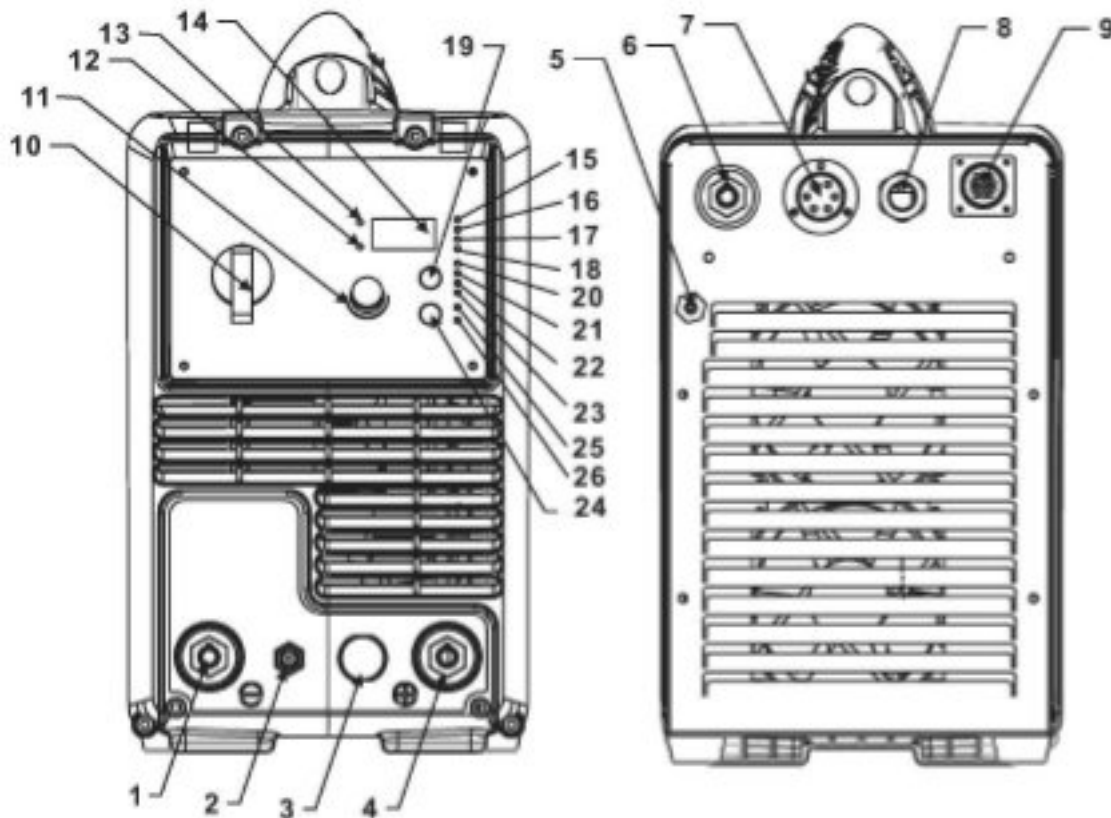
CONTROL AND FUNCTIONS OF 351F -505F CONTROL PANEL

WIRE -FEED UNIT

1. MIG VOLTAGE DIAL
2. MIG CURRENT DIAL
3. INDUCTANCE DIAL
4. WIRE INCH BUTTON
5. GAS FEED BUTTON
6. WATER/AIR COOLING SELECTION BUTTON
7. 2T/4T SELECTION BUTTON
8. PRE FLOW, POST FLOW , SOFT START AND BURNBACK SELECTION BUTTON
9. EURO TORCH CONNECTION SOCKET
10. SPOOL GUN CONNECTION SOCKET
11. WATER CONNECTION
12. WATER CONNECTION
13. WIRE SPOOL HOLDER
14. WIRE FEED MOTOR
15. WIRE FEED TENSION ADJUSTMENT
16. WIRE FEED ROLLERS
17. LOCAL/REMOTE SPOOL GUN SELECTION SWITCH

Power Source

Controls and Functions



CONTROL AND FUNCTIONS OF 351F -505F CONTROL PANEL

- | | |
|---------------------------------------------------|---------------------------------------------------------|
| 1. OUTPUT CONNECTOR - | 15. HOT START L.E.D INDICATOR |
| 2. GAS CONNECTOR | 16. WELDING CURRENT L.E.D INDICATOR |
| 3. TIG TORCH CONNECTOR | 17. ARC FORCE L.E.D INDICATOR |
| 4. OUTPUT CONNECTOR + | 18. 18.DOWN SLOPE L.E.D INDICATOR |
| 5. GAS CONNECTOR | 19. 19.MODE SELECTION BUTTON (MIG/MMA/LIFT TIG) |
| 6. OUTPUT CONNECTOR TO WIRE-FEED | 20. 20.MIG SETTING L.E.D INDICATOR (MIG MODE) |
| 7. INTERCONNECTING LEAD PLUG TO WIRE-FEED | 21. 21.MMA SETTING L.E.D INDICATOR (MMA MODE) |
| 8. INPUT POWER CABLE | 22. 22.MMA LVRD SETTING L.E.D INDICATOR (MMA LVRD MODE) |
| 9. WATER CONNECTOR (TO WATER COOLER**OPTIONAL) | 23. 23.TIG SETTING L.E.D INDICATOR (LIFT TIG MODE) |
| 10. POWER SWITCH | 24. 24.2T / 4T SELECTION BUTTON (LATCH/UNLATCH) |
| 11. MMA/TIG PARAMETER AND CURRENT ADJUSTMENT DIAL | 25. 25.2T MODE L.E.D INDICATOR |
| 12. WARNING INDICATION L.E.D LIGHT | 26. 26.4T MODE L.E.D INDICATOR |
| 13. POWER INDICATION L.E.D LIGHT | |
| 14. WELDING CURRENT AND PARAMETER DISPLAY | |

** PLEASE NOTE THIS MACHINE REQUIRES 3 PHASE INPUT POWER **

Safe Machine Installation

Please read and understand the below BEFORE installation and operation.

This machine uses electricity and as such should be treated with respect.

Please visually check over the machine and only set up and use in a safe work area.

Please check the following:

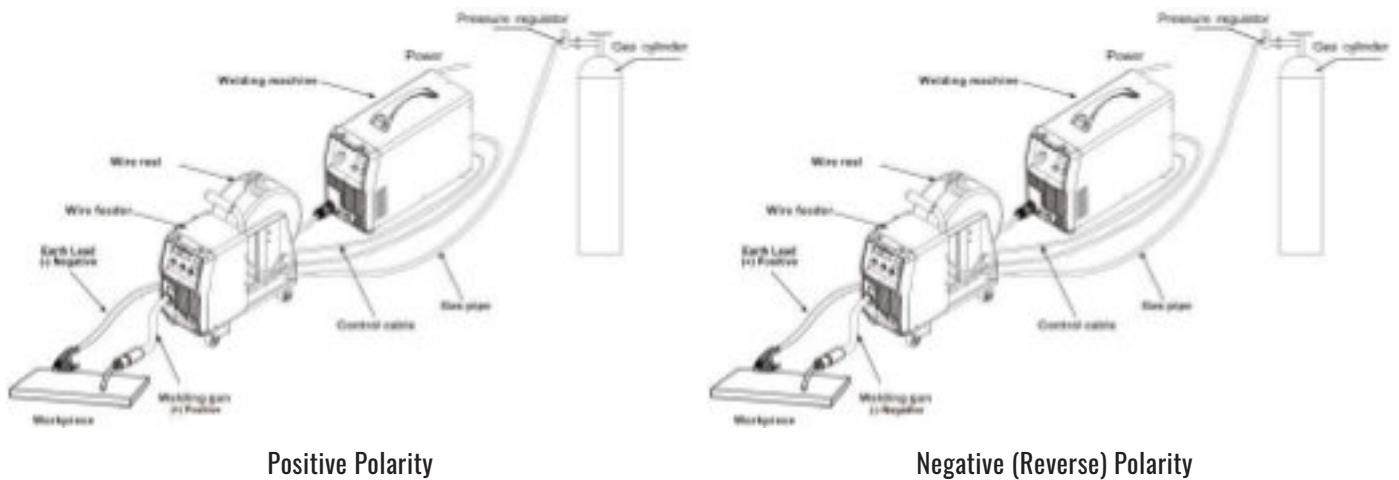
- Check for damage externally on welder.
- All cords in good condition and connected properly.
- Power supply is correct for the application.
- No flammable items within safe distance.
- Good ventilation.
- Correct PPE and safety precautions in use.
- User is familiar with the operation of this machine.

Machine Operation (MIG)

- Turn machine ON.
(“On and off” switch located on front panel)
- Preset the welding voltage and wire speed/current.(MIG)
- Select correct program (Program 1 for manual mode)((Synergic programs found on the inside of wire-feeder door))
- Ensure cooling mode is in gas/air unless a water cooler is installed.
- Preset trigger mode (2t or 4t)
- Check that correct rollers for wire are installed and correctly fitted..
- Check welding wire is correctly fed through the torch with no interruption.
- Check roller tension is correct.
(If tension too low -may feed too slowly or incorrectly)
(If too high -may cut wire or have feed issues including birds-nesting)
- If using gas, check gas is flowing freely when the trigger is pressed and stopping shortly after releasing the trigger.(rule of thumb is gas flow in litres to be 10 x diameter of the wire)
- Ensure torch is as straight as possible as sharp bends or “kinks” may affect the feed of the wire through the liner.
- Confirm Pre-gas, Post-gas, Soft-start and Burn-back parameters are correct.
- Connect Earth lead to the workpiece or to the bench.
- Check operation of trigger and torch, ensure wire is feeding and gas flows through torch.
- Check the workspace for hazards and ensure a clean and tidy work area.

And Operation

MIG



Connect the earth lead connector to the negative (-) quick-connection terminal, and turn clockwise to tighten.

CAUTION: Make sure of the above connection for direct polarity welding; for inverse/reverse polarity , invert the connection: earth lead CONNECTOR to the quick-connection positive (+) terminal.

- Check and connect all fittings.(gas , interconnecting leads etc)
- Select MIG mode on power source.
- Install correct wire and wire rollers to wire-feeder.
- Check settings and setup parameters as required.(select P1 for manual operation or P* for synergic operation)
- Connect earth lead to work-piece or bench. ****See below for how to operate in synergic mode

SYNERGIC OPERATION

The TOPGUN 351F and 505F are able to be operated in SYNERGIC mode.

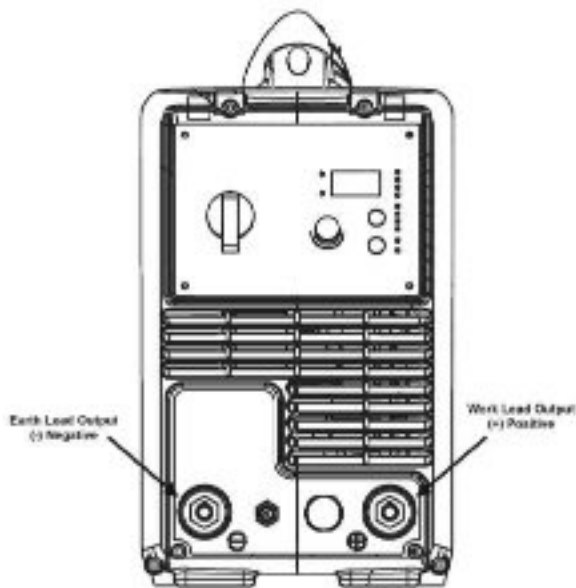
In this mode, only one parameter is necessary to control the welder and is controlled by a single dial. (Amperage/Wire speed.)

1. To Enter this mode, you will need to first select the mode required (listed on the inside of the wire-feeder door, and under the correct machine), by depressing the large left hand Dial on the wire-feeder face/control panel until the display indicator L.E.D is lit under the letter "P", and then scrolling to the desired program (clockwise = higher and anti-clockwise to lower)
2. When your selection has been made, Press the button one more time to save. Once the above step is completed, you will control the welding power of the machine with the Large Middle Dial. (Clockwise to increase welding power and wire speed, and anti-clockwise to decrease welding power and wire speed simultaneously.)(SYNERGIC)

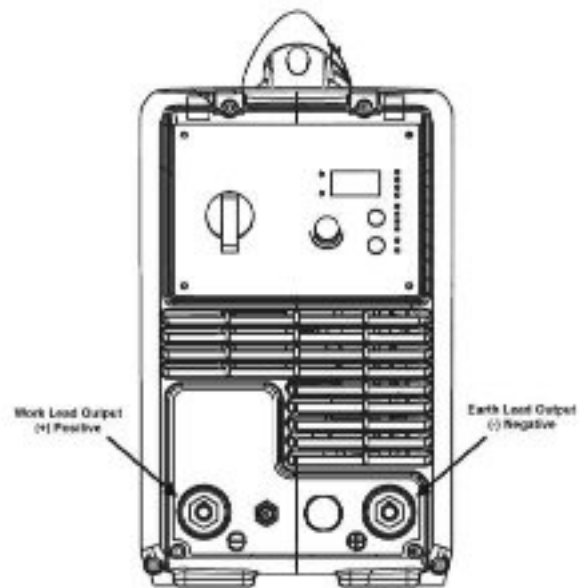
“PI” is manual mode and the default setting to control each parameter manually.

- Please note that when in P1, you will need to control both welding voltage and also amperage/wire-speed manually.

MMA



Positive Polarity



Negative (Reverse) Polarity

Make sure that the supply voltage matches the voltage requirements indicated.

If you increase the length of the leads, be aware that possible damage may occur with excessively long or incorrectly sized leads.

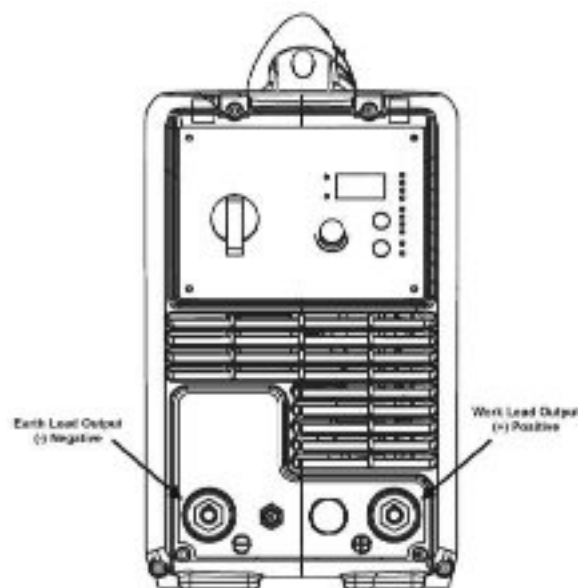
- Select LVRD MMA mode on power source (when selected machine automatically defaults to LVRD mode)
- Connect the earth lead connector to the negative (-) quick-connection terminal, and turn clockwise to tighten.
- Connect the electrode clamp to the positive (+) quick-connection terminal and turn clockwise to tighten.
- Check area for hazards

CAUTION: Make sure of the above connection for direct polarity welding; for inverse/reverse polarity, invert the connection: earth lead CONNECTOR to the quick-connection positive (+) terminal and the electrode holder clamp connector to the negative (-) terminal.

ARC AIR GOUGING

Ensure switch is in MMA mode

Ensure correct polarity for work lead and earth as per below image (positive polarity = workpiece in + and earth in -)



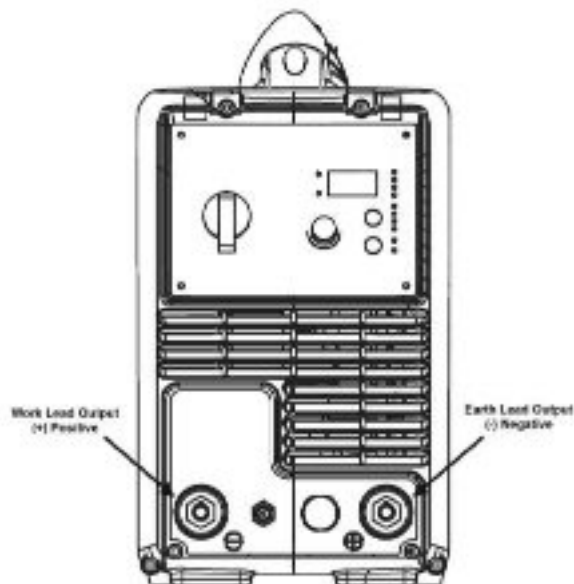
Positive Polarity

*Note: Attach work lead to compressor

LIFT TIG

If you increase the length of the leads, be aware that possible damage may occur with excessively long or incorrectly sized leads.

- Connect the TIG TORCH to the negative (-) quick-connection terminal, and turn clockwise to tighten.
- Connect the earth lead connector to the positive (+) quick-connection terminal and turn clockwise to tighten.
- Connect gas lines as required.
- Select Lift TIG function on power source.
- Select required parameters on power source by pressing control dial and turning clockwise or anticlockwise.
- Connect earth lead to the work-piece or bench.



MAINTENANCE

In order to guarantee that arc welding machine works efficiently and safely, it must be maintained regularly. Customers that understand the maintenance schedule and how to maintain the welding plant, are able to carry out a simple examination and preventative maintenance of the welding plant to potentially reduce the chance of faults and to lengthen the service life of their welding plant.

Maintenance items in detail are in the following table.

- **Warning:** For safety while maintaining the machine, please shut off the supply power and wait for at least 5 minutes before carrying out the below:

DATE	MAINTENANCE SHEDULE AND PROCEDURE
DAILY	<ul style="list-style-type: none"> • CHECK CONDITION OF SWITCHES AND DIALS AND CHECK FOR CORRECT OPERATION. • TURN POWER ON AND CHECK FOR VIBRATIONS, STRANGE SMELLS OR STRANGE NOISES. • OBSERVE THE FRONT PANEL INDICATOR LIGHTS AND ENSURE THEY ARE FUNCTIONING CORRECTLY AND THE DISPLAYS ARE NOT DISPLAYING AN ERROR CODE. • CHECK FOR NORMAL OPERATION OF THE FAN WHEN MACHINE IS UNDER LOAD. • CHECK CONDITION AND FITMENT OF ALL LEADS AND CABLES AND ENSURE MECHANICAL CONNECTIONS ARE FIRMLY IN PLACE. • ENSURE THERE IS NO VISIBLE DAMAGE TO THE POWER INPUT AND OUTPUT CABLES OR EARTH LEAD.
MONTHLY	<ul style="list-style-type: none"> • USING ONLY DRY AND CLEAN AIR, BLOW THE MACHINE OUT PAYING SPECIAL CARE TO NOT ROTATE THE FAN IN THE INCORRECT DIRECTION OF TRAVEL, AND TRY TO NOT DIRECTLY BLOW HIGH PRESSURE AIR DIRECTLY AT COMPONENTS.
QUARTER- LY	<ul style="list-style-type: none"> • IF REQUIRED, HAVE MACHINE INSPECTED AND CALIBRATED TO ENSURE DISPLAYED OUTPUT CURRENT MATCHES THE ACTUAL CURRENT OUTPUT OF THE MACHINE. (THIS SHOULD BE CARRIED OUT BY AN AUTHORIZED TECHNICIAN.)
YEARLY	MEASURE THE INSULATING IMPEDANCE OF THE MAIN CIRCUIT, PCB AND CASE. IF BELOW $1M\Omega$, INSULATION MAY BE DAMAGED AND IN NEED OF REPLACEMENT TO ENSURE CORRECT INSULATION.

Fixes and Faults

TROUBLESHOOTING

*MACHINE NOT TO BE OPENED/WORKED ON UNLESS BY AN AUTHORIZED/CERTIFIED REPAIR AGENT.

**NOT COMPLYING WITH THE ABOVE WILL RESULT IN A VOID OF WARRANTY.

FAULT	CAUSE	SOLUTION
FAN NOT OPERATING	CONNECTION BROKEN FAN BROKEN NO POWER	CHECK CONNECTIONS REPLACE FAN CHECK POWER SUPPLY
NO LIGHTS ON MACHINE PANEL	POWER CONNECTION BROKEN FUSE FAULTY POWER INDICATOR FAULTY	CHECK POWER LEADS AND POWER POINT CONNECTED PROPERLY REPLACE FUSE ON REAR PAN- EL(10A/ 250V) REPLACE FAULTY COMPONENTS
OVER -TEMP INDICATOR LIT	COOLING FAN NOT RUNNING TEMPERATURE TOO HIGH OVER-LOADED THERMOSTAT FAULTY CONTROL BOARD FAULTY	CHECK FAN AND REPLACE ALLOW MACHINE TO COOL DOWN REDUCE CURRENT/VOLTAGE REPLACE THERMOSTAT CHECK AND REPLACE CONTROL
OVER CURRENT LIGHT ON	IGBT FAULTY OUTPUT DIODE FAULTY CONTROL PANEL FAULTY CONTROL BOARD FAULTY	CONTACT DISTRIBUTOR , AGENT OR MANUFACTURER
WIRE-FEED NOT TURNING/WELDING CURRENT NOT ADJUSTABLE	FUSE FAULTY POTENTIOMETER FAULTY BROKEN WIRE DRIVE MOTOR CIRCUIT FAULTY NO POWER OUTPUT	CHANGE THE FUSE 5A/240V (ON LEFT PANEL,OPEN CASE) CHECK CONNECTION AND/OR REPLACE CHECK GUN/TRIGGER FOR OPERATION CHANGE CONTROL PANEL CONTACT THE MANUFACTURER
WELDING VOLTAGE NOT ADJUSTABLE	POTENTIOMETER CONNECTION FAULTY POTENTIOMETER FAULTY BROKEN CIRCUIT	CHECK CONNECTIONS CHECK AND REPLACE FAULTY POTENTIOMETER (5K) CHANGE CONTROL BOARD
LOW VOLTAGE INDICATOR ON	INPUT POWER IS TOO LOW INPUT CAPACITY TOO LOW CONTROL PANEL DAMAGED CABLES ARE NOT CONNECTED PROPERLY WIRE FEED CIRCUIT FAULTY	CHECK POWER SUPPLY CHECK POWER SUPPLY (AMPS) CHECK AND REPLACE CONTROL BOARD IS REQUIRED CHECK AND CORRECT CONTACT THE MANUFACTURER

*MACHINE NOT TO BE OPENED/WORKED ON UNLESS BY AN AUTHORIZED/CERTIFIED REPAIR AGENT.

**NOT COMPLYING WITH THE ABOVE WILL RESULT IN A VOID OF WARRANTY.

DIAGRAM



Transportation, Storage and Suitable Environment

- The Packaging supplied with this item is suitable for Air, Sea, railway and highway (class 3) transportation.
- Please pay attention to the condition of the package whilst in transit.
- Moisture may damage the packaging. Please keep dry.
- Operating environment:

A.	TEMPERATURE RANGE:	OPERATING RANGE -	0°C -40°C
		TRANSPORT-	-25°C -+55°C

B. HUMIDITY RANGE : 40°C - 50%RH
20°C - 90% RH

C. PLEASE ENSURE THAT EXPOSURE TO DUST, ACIDS, CAUSTIC GASES AND OTHER CONTAMINANTS IN THE ENVIRONMENT ARE AS LOW AS POSSIBLE (NOT INCLUDING THE WELDING PROCESS)

D. PLEASE DO NOT EXPOSE MACHINE OR PACKAGING TO MOISTURE/WATER.

E. PLEASE MINIMIZE THE ANGLE OF THE MACHINE IN RELATION TO THE GROUND DURING OPERATION. (15* DEGREES>)

Quality Assurance

IF YOU HAVE ANY PROBLEMS WITH THE QUALITY OF THE MACHINE INCLUDED HEREIN,


PLEASE CONTACT TOPGUN WELDING AUSTRALIA OR AN APPROVED AGENT (PLACE OF PURCHASE) AND HAVE A COPY OF YOUR PROOF OF PURCHASE AND SERIAL NUMBER READY.

TOPGUN WELDING AUSTRALIA MACHINES HAVE A 3YR WARRANTY WHEN TRANSPORTED AND OPERATED IN ACCORDANCE WITH THE MANUAL.

Accessories and Consumables

PARTS AND SPARES

Hanpieces		
Binzel Style MB36 Mig Torch	3 Metre 4 Metre 5 Metre	TGTMB3603 TGTMB3604 TGTMB3605
Earth Clamps	300 Amp 400 Amp 500 Amp	ACCLP300 ACCLP400 ACCLP500
Magnetic Earth Clamps	300 Amp 800 Amp	MAWEC300 MAWEC800
Electrode Holders Twist Lock	200 Amp 300 Amp 400 Amp	ACEHTL200 ACEHTL300 ACEHTL400
Electrode Holders Tong Type	200 Amp 300 Amp 400 Amp 500 Amp	ACEHTT200 ACEHTT300 ACEHTT400 ACEHTT500
Wire Feed Rollers		
Roller 30/10 0.8-0.9mm Flux		TGR30100809F
Roller 30/10 0.8-0.9mm Aluminium		TGR30100809U
Roller 30/10 0.8-0.9mm Steel		TGR30100809V
Roller 30/10 0.9-1.2mm Flux		TGR30100912F
Roller 30/10 0.9-1.2mm Aluminium		TGR30100912U
Roller 30/10 0.9-1.2mm Steel		TGR30100912V
Roller 30/10 1.2-1.6mm Flux		TGR30101216F
Roller 30/10 1.2-1.6mm Aluminium		TGR30101216U
Roller 30/10 1.2-1.6mm Steel		TGR30101216V
Electrodes		
6013 General Purpose	2.5mm 0.5kg pack 3.2mm 0.5kg pack	CETG6013GP0525 CETG6013GP0532
316L-16 Stainless Steel	2.5mm 0.5kg pack 3.2mm 0.5kg pack	CETG316L160525 CETG316L160532
312-16 Dissimilar Metals	2.5mm 0.5kg pack 3.2mm 0.5kg pack	CETG312160525 CETG312160532
7016 Low Hydrogen	2.5mm 0.5kg pack 3.2mm 0.5kg pack	CETG70160525 CETG70160532
Hard Facing	3.2mm 0.5kg pack	CETGHF0532
Cast Iron	Combo pack Contains: 5 x 2.4MM 5 x 3.2mm 10 x 4.0mm	CETGNIFECOMBO

Accessories		
Chipping Hammer	Rubber Handle Spring Handle	ACMCH1 ACMCH2
Welding Pliers	8" Welding Pliers	TGACPLIER
Wire Brush	3 Row Steel 4 Row Steel 3 Row Stainless 4 Row Stainless	ACB3 ACB4 ACB421 ACB420
Auto-Darkening Helmets		
	Topgun Warrior Series Auto Darkening Welding Helmet	Gloss Black -TGHWARGBLK Blue Inferno -TGHWARBLUINF Red Inferno -TGHWARINFERNO Carbon Fibre -TGHWARCFIBRE
	Warrior Helmet Harness	TGTHH
	Warrior Inner Lens Pk5	TGHLWI
	Warrior Outer Lens Pk5	TGHLWO
	Topgun TITAN Series Auto Darkening Welding Helmet	Shadow -TGHTSHAD Cold Carbon -TGHTCCARB Bionix -TGHTBION Envious -TGHTENVI Robot -TGHTROBO Rich Smoke -TGHTRICH
	TITAN Helmet Harness	TGTHH
	TITAN Helmet Inner Lens Pk5	TGHLTI
	TITAN Helmet Outer Lens Pk5	TGHLTO
Apparel		
Welding Jackets	Hi-Vis Welding Jacket	TGACWJHVL TGACWJHVXL TGACWJHVXXL TGACWJHVXXXL
	Professional Leather Welding Jacket	TGACWJRBL TGACWJRBXL TGACWJRBXXL TGACWJRBXXXL
Gloves	Blue/Yellow Welding Gloves	TGACGBY
	Gold/Red Welding Gloves	TGACGRG
	Premium Black/White	TGACGBWP
	Premium Black/Red	TGACGBRP
	Alumized	TGACGAL
Welding Sleeves		TGACSL1
Welding Apron		TGACAP1
Welding Spats		TGACSP1
Welding Hoods	Leather	TGACLHOOD
	Fire retardant cotton	TGACPBHOOD

			
WARNING	<ul style="list-style-type: none"> ● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground. 	<ul style="list-style-type: none"> ● Keep flammable materials away. 	<ul style="list-style-type: none"> ● Wear eye, ear and body protection.
Spanish AVISO DE PRECAUCION	<ul style="list-style-type: none"> ● No toque las partes e los electrodos bajo carga con la piel o ropa mojada. ● Aíslese del trabajo y de la tierra. 	<ul style="list-style-type: none"> ● Mantenga el material combustible fuera del área de trabajo. 	<ul style="list-style-type: none"> ● Protéjase los ojos, los oídos y el cuerpo.
French ATTENTION	<ul style="list-style-type: none"> ● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isoler-vous du travail et de la terre. 	<ul style="list-style-type: none"> ● Garder à l'écart de tout matériel inflammable. 	<ul style="list-style-type: none"> ● Protégez vos yeux, vos oreilles et votre corps.
German WARNUNG	<ul style="list-style-type: none"> ● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden! 	<ul style="list-style-type: none"> ● Entfernen Sie brennbares Material! 	<ul style="list-style-type: none"> ● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese ATENÇÃO	<ul style="list-style-type: none"> ● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isola-se da peça e terra. 	<ul style="list-style-type: none"> ● Mantenha inflamáveis bem guardados. 	<ul style="list-style-type: none"> ● Use proteção para a vista, ouvido e corpo.
Japanese 注意事項	<ul style="list-style-type: none"> ● 通電中の電気部品、又は溶接にヒケやぬれた手で触れないこと。 ● 施工時やアースから身体が絶縁されている様にして下さい。 	<ul style="list-style-type: none"> ● 燃えやすいものの側での溶接作業は厳禁にはなりません。 	<ul style="list-style-type: none"> ● 目、耳及び身体に保護具をして下さい。
Chinese 警告	<ul style="list-style-type: none"> ● 本款设备在通电和焊接时勿碰及带电。 ● 使用自己绝缘面和工作绝缘。 	<ul style="list-style-type: none"> ● 距一切易燃物必须移开工作场所。 	<ul style="list-style-type: none"> ● 佩戴眼、耳及身体防护绝缘用具。
Korean 위험	<ul style="list-style-type: none"> ● 전도성이나 용접열을 받은 물건 또는 피부로 절대 접촉하지 마십시오. ● 모래지 끈자를 착용하지 마십시오. 	<ul style="list-style-type: none"> ● 인화성 물질을 접근 시키지 마십시오. 	<ul style="list-style-type: none"> ● 눈, 귀와 몸에 보호장구를 착용하십시오.
Arabic تحذير	<ul style="list-style-type: none"> ● لا تلمس الأجزاء التي يمر بها التيار الكهربائي أو الأقطاب بهذه الجسم أو بالملابس المبللة بالماء. ● ضع عازلًا على جسمك خلال العمل. 	<ul style="list-style-type: none"> ● ضع المواد القابلة للاشتعال في مكان بعيد. 	<ul style="list-style-type: none"> ● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

			
<ul style="list-style-type: none"> ● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone. 	<ul style="list-style-type: none"> ● Turn power off before servicing. 	<ul style="list-style-type: none"> ● Do not operate with panel open or guards off. 	WARNING
<ul style="list-style-type: none"> ● Las humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases. 	<ul style="list-style-type: none"> ● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio. 	<ul style="list-style-type: none"> ● No operar con panel abierto o guardas quitadas. 	Spanish AVISO DE PRECAUCION
<ul style="list-style-type: none"> ● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail. 	<ul style="list-style-type: none"> ● Débranchez le câble avant l'entretien. 	<ul style="list-style-type: none"> ● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés. 	French ATTENTION
<ul style="list-style-type: none"> ● Vermeiden Sie das Einatmen von Schweißrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes! 	<ul style="list-style-type: none"> ● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig trennen; Maschine anhaltend) 	<ul style="list-style-type: none"> ● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen! 	German WARNUNG
<ul style="list-style-type: none"> ● Mantenha-se fora da fumaça. ● Use ventilação e exaustão para remover fumo da zona respiratória. 	<ul style="list-style-type: none"> ● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas. 	<ul style="list-style-type: none"> ● Mantenha-se afastado das partes móveis. ● Não opere com as tampas abertas ou guardas removidas. 	Portuguese ATENÇÃO
<ul style="list-style-type: none"> ● ヒュームから顔を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。 	<ul style="list-style-type: none"> ● メンテナンス・サービスにむかひかる場合には、必ず電源スイッチを必ず切して下さい。 	<ul style="list-style-type: none"> ● パネルやカバーを取り外したままでは機械操作をしないで下さい。 	Japanese 注意事項
<ul style="list-style-type: none"> ● 隔形遠離煙霧。 ● 在呼吸區使用通風或排風設備。 	<ul style="list-style-type: none"> ● 維修前切斷電路。 	<ul style="list-style-type: none"> ● 保護板打開前沒有安全罩禁止操作。 	Chinese 警告
<ul style="list-style-type: none"> ● 얼굴로부터 동봉가스를 멀리하십시오. ● 호흡지역으로부터 동봉가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오. 	<ul style="list-style-type: none"> ● 보수전에 전원을 차단하십시오. 	<ul style="list-style-type: none"> ● 크래이 형인 장비로 작동시키지 마세요. 	Korean 위험
<ul style="list-style-type: none"> ● بعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان لتفارج لكي بعد الدخان عن المنطقة التي تتلقى فيها. 	<ul style="list-style-type: none"> ● قطع التيار الكهربائي قبل القيام بأية صيانة. 	<ul style="list-style-type: none"> ● لا تلمس هذا الجهاز إلا ثلاث الأظفحة المخصصة لرفافة ليست هذه. 	Arabic تحذير

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使用機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的鐵桿材料，並請遵守貴方約有關勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتعمّن والفهم تعليمات الصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.

