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## R-TECH P51D PLASMA CUTTER

### OPERATION INSTRUCTIONS





Thank you for selecting the R-Tech P51D Inverter Plasma Cutter.

The P51D has many benefits over traditional Plasma Cutters, including NO-HF pilot arc starting for reduced interference, gouging function, trigger latching and CNC interface.

We want you to take pride in operating our P51D, as much pride as we have taken in making this product for you. Please read all information in this manual before operation

**PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY**

When this equipment is shipped, title passes to the purchaser upon receipt from the courier. Consequently all claims for material damaged in shipment must be made by purchaser against the transportation company used.

Please record your equipment identification below for future reference. This information can be found on data plate at rear of machine.

Product: P51D Plasma Cutter

Serial No. \_\_\_\_\_

Date of Purchase \_\_\_\_\_

Where Purchased \_\_\_\_\_

Whenever you request replacement parts or information on this equipment please always supply information you have recorded above

Pay particular attention to the safety instructions we have provided you for your protection. The level of seriousness to be applied to each section is explained below

**WARNING**



This statement appears where the information must be followed exactly to avoid serious personal injury.

**CAUTION**

This statement appears where the information must be followed to avoid a minor personal injury or damage to this equipment.

## **Introduction**

The R-Tech P51D Plasma Cutter is a member of our field acclaimed family of cutting machines.

Premium features include

60% Industrial duty cycle

Inverter power source - more efficient

Quiet fan cooling system

Gouging option

CNC interface

Lightweight and portable

Euro type torch fittings for easy torch fitment/replacement

## **Cutting Capability – Duty Cycle**

The R-Tech P51D is rated at 50 Amps at 60% duty cycle on a ten minute basis.

If the duty cycle is exceeded a thermal protector will shut machine off until the machine cools.

## **Safety Precautions**

**Read entire section before starting installation.**

### **Warning!**



Electric Shock can kill – Only qualified personnel should perform this installation. Turn off input power at the fuse box before working on this equipment. Do not touch electrically live parts. Always connect the machine to an earthed mains supply as per national recommended standards.

### **Select suitable location**

Place the cutter where clean cooling air can freely circulate in and out of the machines front & rear louvre vents. Dirt, dust or any foreign material that can be drawn through vents into machine must be kept to a minimum. Failure to observe these precautions can result in excessive operating temperatures which can lead to plant failure.

### **Grinding**

Do not direct grinding particles towards the machine.  
An abundance of conductive material can cause plant failure.

### **Transport & unloading**

Never underestimate the weight of equipment, never move or leave suspended in the air above people.  
Use recommended lifting/handling equipment at all times.

## Electrical installation

### WARNING ELECTRIC SHOCK CAN KILL



Electric Shock can kill – Only qualified personnel should perform this installation. Turn off input power at the fuse box before working on this equipment. Do not touch electrically live parts. Always connect the machine to an earthed mains supply as per national recommended standards.

#### Machine grounding and Interference Protection

This machine must be grounded to earth. See national electrical codes for proper grounding methods.

The high frequency generator being similar to a radio transmitter may cause interference to radio, TV and other electronic equipment. These problems may be the result of radiated interference.

Proper grounding methods can reduce or eliminate this.

Radiated interference can develop in the following ways

1. Direct interference from machine power source.
2. Direct interference from the torch & earth leads.
3. Direct interference radiated from feedback into power lines.
4. Interference from re-radiation by un-grounded metallic objects.

Keeping these contributing factors in mind, installing equipment as per following instructions should minimize problems.

1. Keep the machines input power lines as short as possible and enclose as much of them as possible in metal conduit or equivalent shielding. There should be a good electrical contact between this conduit and ground (Earth).
2. Keep the work and electrode leads as short as possible. Tape the leads together where practical.
3. Be sure the torch and earth leads rubber coverings are free from cuts and cracks that allow cutting power leakage
4. Keep earth lead connection to work in good condition – Clean area on workbench where earth clamp is situated on a regular basis.

## **Electrical installation cont.**

### **Input Connections**

Make sure the voltage, phase and frequency of input power is as specified on machine rating plate located at rear of machine.

Have a qualified electrician provide suitable input power as per national electrical codes. Make sure machine is earthed / grounded.

Make sure fuse or circuit breaker is correct rating for machine. Using fuses or circuit breakers smaller than recommended will result in 'nuisance' shut off from machine inrush currents even if cutting at low amperages.

Failure to follow these instructions can cause immediate failure within the machine and void machines warranty.

Turn the input power OFF at the mains switch & fuse box before working on this equipment. Have a qualified electrician install & service this equipment.

Allow machine to sit for 5 minutes minimum to allow the power capacitors to discharge before working inside this equipment. Do not touch electrically live parts

The P51D Plasma Cutter requires a 240V 50/60Hz supply. It requires a 32A supply.

It comes with a 2.5 metre mains cable attached.

Connect wires according to national coding.

Brown wire – Live

Blue wire – Neutral

Green/Yellow Wire – Earth (Ground)

### **Connecting to an Engine Driven Generator**

If connecting this machine to an engine driven generator please ensure the following

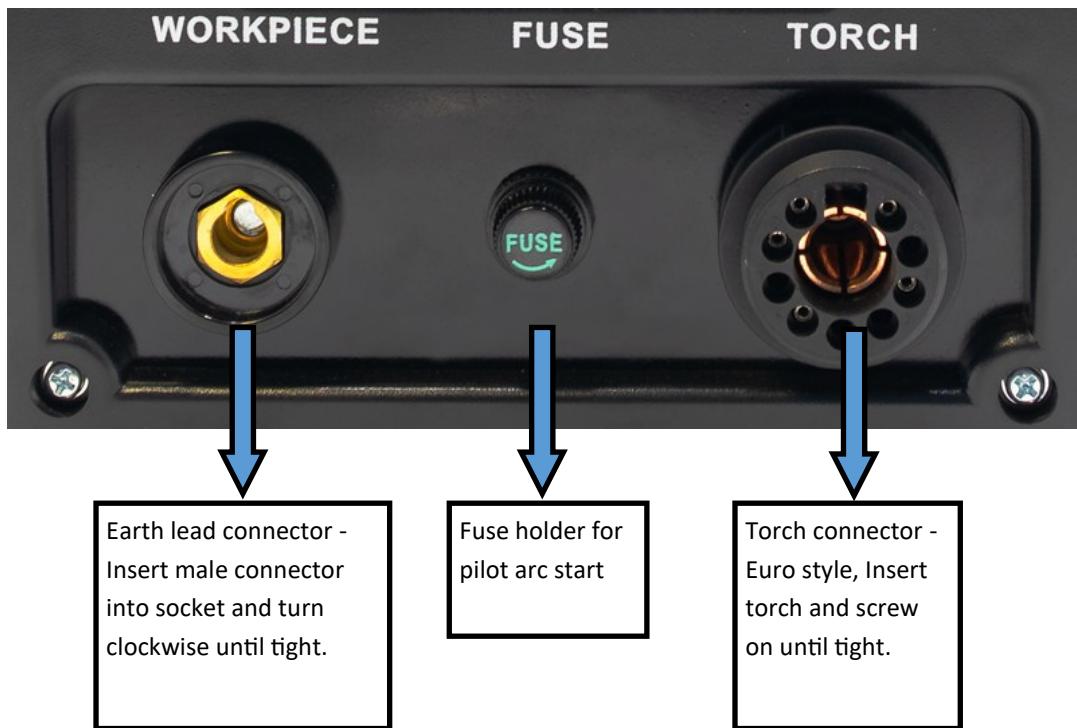
Minimum Generator KVA Output – 12 KVA continuous Generator to be fitted with AVR (automatic voltage regulation) DO NOT USE ON A GENERATOR WITHOUT AVR

Connecting to a generator without the above minimum requirements will invalidate your warranty.

## Technical specifications

## Connections

### Front panel connections

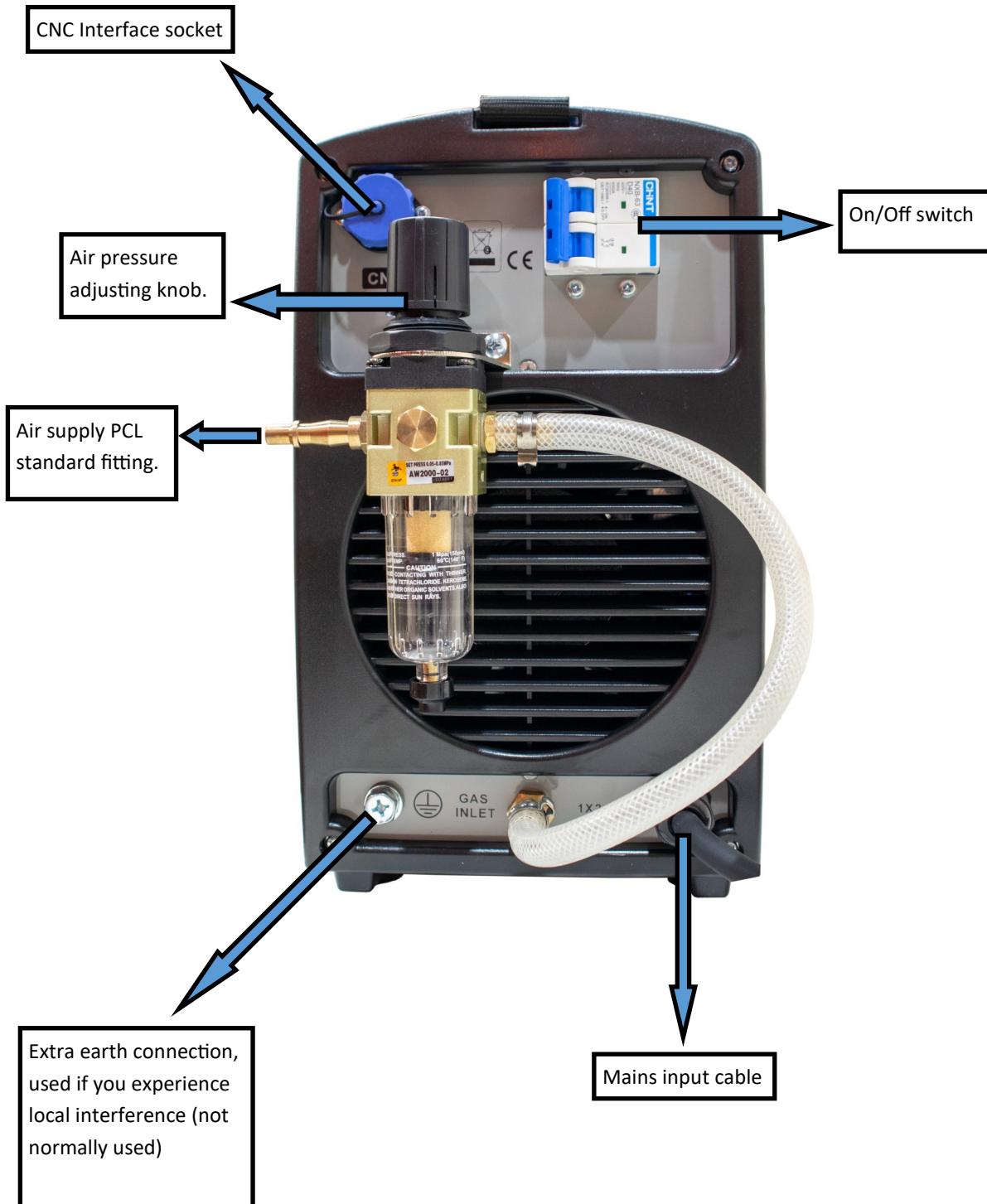


### Euro torch connector

The image below shows the torch supplied with P51D, when fitting torch ensure pins and lug are aligned and then push torch in fully then tighten retaining ring.

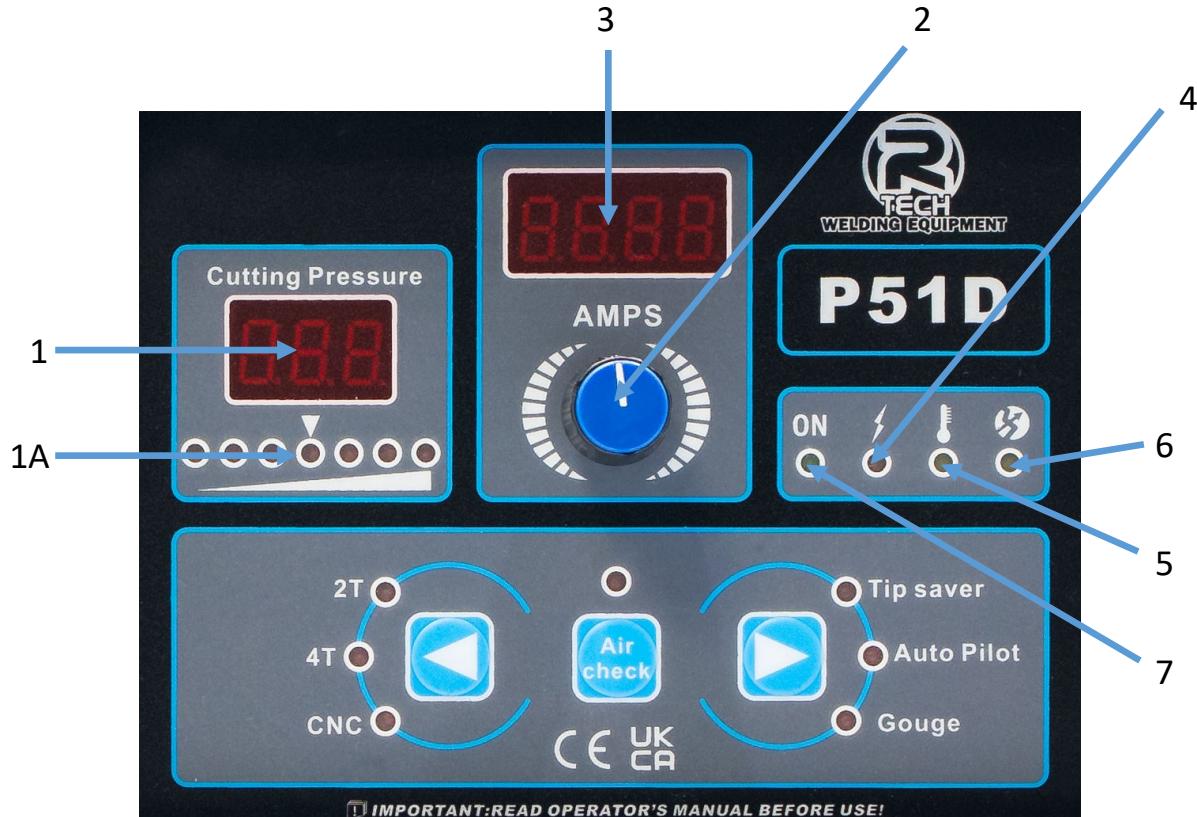


## Rear panel connections.



Air pressure adjusting knob - Pull up knob to enable adjustment - once desired air pressure is achieved after pressing air check button so air flows through torch and 70 PSI for cutting or 60PSI for gouging is displayed in air pressure LED - now push knob down to lock.

## Front panel Operation



1 - Air pressure display

Press Air Check button so air flows, now turn regulator pressure control knob until LED in middle is lit (1A) - Setting too low/high air pressure will affect starting of arc and cut performance.

2 - This adjusts the cutting amperage from 20 to 50 amps.

3 - Amperage LED display - Shows selected cutting amperage.

4 - Warning LED - If illuminated check troubleshooting guide.

5 - Over temperature warning light - allow machine to cool and check louvres for obstruction.

6 - Torch safety cap removed warning light - ensure consumables are fitted correctly and safety cap in screwed on tightly - machine will not work when illuminated.

7 - Power on LED - Lights green when machine is powered and on/off switch set to on.

## Front panel Operation cont..



8 - 2T LED - Normal trigger operation, press to start cut, release to stop.

9 - 4T LED - Trigger latching, press/release trigger to start cut, cut will continue until button is pressed and released again.

10. CNC mode - See page 14

11. Left selector button, cycles through 2T, 4T and CNC modes

12. Right selector button, cycles through Auto pilot, Tip saver and Gouge modes

13 - Air check button - press button to open air valve so you can set air cutting pressure correctly, once correct pressure is set, press to stop air.

14 - Tip saver - When selected once you come to end of work, the arc will stop and not restart.

15 - Auto pilot - When selected pilot arc is restarted automatically if trigger is pressed when you come to end of work (ideal for cutting mesh etc).

16 - Gouge - When selected you are in gouge mode and will need to fit consumables to torch specifically for gouging. When gouging ensure angle of torch allows dross to blow away and not directly back into torch. Always ensure no persons are in area to avoid injury.

## Operating Machine

1. Ensure machine has been setup as previously stated
2. Turn on the machine and the power light indicates and cooling fan is running
3. Press the air check button to get the air flowing from torch head, now set the air pressure in gauge using adjuster on regulator to 75 PSI, once the correct air pressure has been set press down the adjuster on air regulator, it is always best to set pressure while air is flowing. Now turn of the air check. You will notice once air stops flowing, the gauge will read the higher backup pressure, this is normal.
4. Ensure earth clamp is connected to workpiece or workbench ensuring a good clean point of contact.
5. Select cutting amperage knob to desired cutting power 20 Amps for 2- 3mm on mild steel, 50 amps for up to 20mm on mild steel (24mm severance). When cutting aluminium, alloys and stainless steel cutting thickness is reduced by approximately 20%
6. Hold torch in starting position on work and press torch switch and the pilot arc will initiate (blue flame from torch) , once the pilot arc is in contact with the workpiece it will sense this and switch to main cutting power. Once you come to the end of cut/workpiece the machine will sense this and turn off main cutting power and re-start the pilot arc. If you have now finished cutting release torch trigger and pilot arc will stop. Air will continue to flow from torch for a preset time to cool torch consumables.

### Getting correct amperage / cutting speed for desired job.

The combination of correct cutting amperage and travel speed can change per user, here are some tips on obtaining optimum settings.

**Blow back when cutting** – If you experience blow back and the metal is not cut all the way through, you either are traveling too fast or you need to increase the cutting amperage

**Cutting arc is erratic and work is being cut all way through.** You are traveling too slow or cutting with too high amperage for work. What is happening is the machine is sensing that there is no metal left to cut and turning off main cutting power and going back to pilot arc mode and when you move again it senses more metal to cut and brings main cutting power back in.

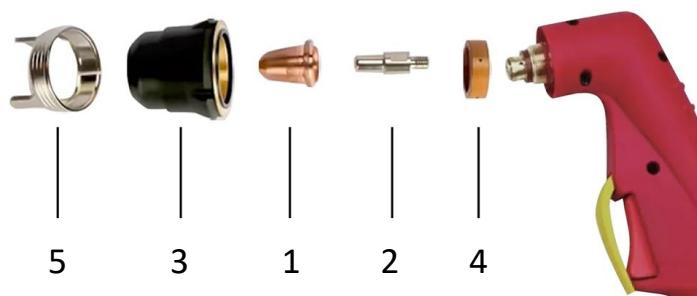
It can take a while to get used to plasma cutting if never done before. Experiment with settings on some scrap material until you find the best amperage / cutting speed for user.

Some customers will use 50 amps to cut thinner material, this is OK, travel speed will be very fast and the cut width will be at its maximum, if you want a finer cut on thin material turn the amps down and experiment with your travel speed to get the best cut for you.

## Replacing torch consumables.

**Please ensure machine is turned off before changing consumables**

1. Switch off machine, Ensure torch has cooled down to avoid burns.
2. Unscrew the retaining nozzle & remove the cutting tip
3. Check the condition of cutting electrode, replace if cutting electrode tip is worn.
4. Fit new cutting tip if required if cutting hole is distorted or an angled cut happens replace the cutting tip.
5. It is normally good practice to replace electrode and cutting tip as a pair
6. Check condition of brown bakerlite swirl ring (gas distributor), if signs of pitting / burning replace item
7. Refit retaining nozzle by screwing on hand tight, Turn machine back on and continue cutting



### Standard cutting consumables (not gouging)

Description	Part No.
1. Cutting tip 1.0mm	P51D-IPT60-CT
2. Electrode	P51D-IPT60-EL
3. Retaining nozzle	P51D-IPT60-RN
4. Gas distributor/diffuser	P51D-IPT60-GD
5. Double pointed spacer	P51D-IPT60-DPS
6M Complete torch	P51D-IPT60-6MHHT
Torch head bare	P51D-IPT60-THH

### Gouging consumables (not cutting)

Description	Part No.
Gouging tip 1.6mm	P51D-IPT60-GTIP
Electrode	P51D-IPT60-EL
Gouging outside nozzle	P51D-IPT60-GON
Gouging shield cap	P51D-IPT60-GSC
Gas distributor/diffuser	P51D-IPT60-GD
Note - Electrode and gas distributor are the same for cutting and gouging.	

## CNC interface

The R-Tech P51D comes with CNC interface on rear of machine.

When not in use, please keep protective cover fitted on socket.

CNC Interface connections	Pins
Start cutting	1 & 2, close circuit to start
Cutting voltage + positive (For THC controller)	6 - default 50/1 divided
Cutting voltage - negative (For THC controller)	4 - default 50/1 divided
Arc success - (OK to move)	9 & 10- closed circuit when cutting started

When using in CNC mode, ensure CNC is selected on left menu on front screen and Auto Pilot is selected in right screen menu.

The CNC controller will start and stop cutting arc accordingly to its cut program.

## **Troubleshooting**

### **No output - Display is not lit**

Check machine on/off switch is in the 'on' position

Check Input power to machine

Check plug wiring

Check mains trip / fuses

### **No output - Fan runs - Display is lit**

Check torch connections are secure and torch switch operation, try replacing torch.

### **No pilot arc when trigger pressed – display is lit**

Check air pressure is set correctly

Check torch consumables are correctly fitted and torch safety warning light is not illuminated

Check pilot arc fuse on front panel of machine.

### **Erratic cutting - torch spitting when cutting.**

Check condition of torch consumables and replace if worn.

Ensure correct amperage for thickness of metal, if travel speed is too low or too much cutting power the machine will sense no metal to cut so will turn pilot arc back on, this is pilot arc restart (Auto Pilot)

### **Poor cut quality, torch consumables wearing quickly.**

Water contamination in torch head, check for water in water trap at rear of machine, if water is present, drain air compressor, clean water out of air lines and empty water trap by pressing water release button on bottom of air regulator water trap. Fit new torch consumables.

**Please contact our technical support via contact us page on website or call on 01452 733933 to speak to one of our experienced and friendly engineers who will assist you with any technical issues.**

			
<b>WARNING</b>	<ul style="list-style-type: none"> <li>Do not touch electrically live parts or electrode with skin or wet clothing.</li> <li>Insulate yourself from work and ground.</li> </ul>	<ul style="list-style-type: none"> <li>Keep flammable materials away.</li> </ul>	<ul style="list-style-type: none"> <li>Wear eye, ear and body protection.</li> </ul>
Spanish <b>AVISO DE PRECAUCION</b>	<ul style="list-style-type: none"> <li>No toque las partes o los electrodos bajo carga con la piel o ropa mojada.</li> <li>Aislese del trabajo y de la tierra.</li> </ul>	<ul style="list-style-type: none"> <li>Mantenga el material combustible fuera del área de trabajo.</li> </ul>	<ul style="list-style-type: none"> <li>Protéjase los ojos, los oídos y el cuerpo.</li> </ul>
French <b>ATTENTION</b>	<ul style="list-style-type: none"> <li>Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension.</li> <li>Isolez-vous du travail et de la terre.</li> </ul>	<ul style="list-style-type: none"> <li>Gardez à l'écart de tout matériel inflammable.</li> </ul>	<ul style="list-style-type: none"> <li>Protégez vos yeux, vos oreilles et votre corps.</li> </ul>
German <b>WARNUNG</b>	<ul style="list-style-type: none"> <li>Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung!</li> <li>Isolieren Sie sich von den Elektroden und dem Erdboden!</li> </ul>	<ul style="list-style-type: none"> <li>Entfernen Sie brennbarres Material!</li> </ul>	<ul style="list-style-type: none"> <li>Tragen Sie Augen-, Ohren- und Körperschutz!</li> </ul>
Portuguese <b>ATENÇÃO</b>	<ul style="list-style-type: none"> <li>Não toque partes elétricas e elektrodos com a pele ou roupa molhada.</li> <li>Isole-se da peça e terra.</li> </ul>	<ul style="list-style-type: none"> <li>Mantenha inflamáveis bem guardados.</li> </ul>	<ul style="list-style-type: none"> <li>Use proteção para a vista, ouvido e corpo.</li> </ul>
Japanese <b>注意事項</b>	<ul style="list-style-type: none"> <li>送電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。</li> <li>施工物やアースから身体が絶縁されている様にして下さい。</li> </ul>	<ul style="list-style-type: none"> <li>燃えやすいものの側での溶接作業は絶対にしてはなりません。</li> </ul>	<ul style="list-style-type: none"> <li>目、耳及び身体に保護具をして下さい。</li> </ul>
Chinese <b>警告</b>	<ul style="list-style-type: none"> <li>皮肤或湿衣物切勿接触带电部件及焊条。</li> <li>使你自己與地面和工件絕緣。</li> </ul>	<ul style="list-style-type: none"> <li>把一切易燃物品移離工作場所。</li> </ul>	<ul style="list-style-type: none"> <li>佩戴眼、耳及身體勞動保護用具。</li> </ul>
Korean <b>위험</b>	<ul style="list-style-type: none"> <li>전도체나 용접봉을 젖은 헝겊 또는 피부로 절대 접촉치 마십시오.</li> <li>도제와 접지를 접촉치 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>인화성 물질을 접근 시키지 마시요.</li> </ul>	<ul style="list-style-type: none"> <li>눈, 귀와 몸에 보호장구를 착용하십시오.</li> </ul>
Arabic <b>تحذير</b>	<ul style="list-style-type: none"> <li>لا تلمس الأجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجذد الجسم أو بالملابس المبللة بالماء.</li> <li>ضع عازلاً على جسمك خلال العمل.</li> </ul>	<ul style="list-style-type: none"> <li>ضع المواد القابلة للاشتعال في مكان بعيد.</li> </ul>	<ul style="list-style-type: none"> <li>ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.</li> </ul>

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"> <li>Keep your head out of fumes.</li> <li>Use ventilation or exhaust to remove fumes from breathing zone.</li> </ul>	<ul style="list-style-type: none"> <li>Turn power off before servicing.</li> </ul>	<ul style="list-style-type: none"> <li>Do not operate with panel open or guards off.</li> </ul>	<b>WARNING</b>
<ul style="list-style-type: none"> <li>Los humos fuera de la zona de respiración.</li> <li>Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.</li> </ul>	<ul style="list-style-type: none"> <li>Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.</li> </ul>	<ul style="list-style-type: none"> <li>No operar con panel abierto o guardas quitadas.</li> </ul>	<span>Spanish</span> <b>AVISO DE PRECAUCION</b>
<ul style="list-style-type: none"> <li>Gardez la tête à l'écart des fumées.</li> <li>Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.</li> </ul>	<ul style="list-style-type: none"> <li>Débranchez le courant avant l'entretien.</li> </ul>	<ul style="list-style-type: none"> <li>N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.</li> </ul>	<span>French</span> <b>ATTENTION</b>
<ul style="list-style-type: none"> <li>Vermeiden Sie das Einatmen von Schweißraucht!</li> <li>Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!</li> </ul>	<ul style="list-style-type: none"> <li>Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)</li> </ul>	<ul style="list-style-type: none"> <li>Anlage nie ohne Schutzgehäuse oder Innenenschutzverkleidung in Betrieb setzen!</li> </ul>	<span>German</span> <b>WARNUNG</b>
<ul style="list-style-type: none"> <li>Manlenha seu rosto da fumaça.</li> <li>Use ventilação e exaustão para remover fumo da zona respiratória.</li> </ul>	<ul style="list-style-type: none"> <li>Não opere com as tampas removidas.</li> <li>Desligue a corrente antes de fazer serviço.</li> <li>Não toque as partes elétricas nuas.</li> </ul>	<ul style="list-style-type: none"> <li>Mantenha-se afastado das partes moventes.</li> <li>Não opere com os painéis abertos ou guardas removidas.</li> </ul>	<span>Portuguese</span> <b>ATENÇÃO</b>
<ul style="list-style-type: none"> <li>ヒュームから頭を離すようにして下さい。</li> <li>換気や排煙に十分留意して下さい。</li> </ul>	<ul style="list-style-type: none"> <li>メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。</li> </ul>	<ul style="list-style-type: none"> <li>パネルやカバーを取り外したまま操作操作をしないで下さい。</li> </ul>	<span>Japanese</span> <b>注意事項</b>
<ul style="list-style-type: none"> <li>頭部遠離煙霧。</li> <li>在呼吸區使用通風或排風器除煙。</li> </ul>	<ul style="list-style-type: none"> <li>维修前切断电源。</li> </ul>	<ul style="list-style-type: none"> <li>儀表板打開或沒有安全罩時不準作業。</li> </ul>	<span>Chinese</span> <b>警告</b>
<ul style="list-style-type: none"> <li>얼굴로부터 용접가스를 멀리하십시오.</li> <li>호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오.</li> </ul>	<ul style="list-style-type: none"> <li>보수전에 전원을 차단하십시오.</li> </ul>	<ul style="list-style-type: none"> <li>판넬이 열린 상태로 작동하지 마십시오.</li> </ul>	<span>Korean</span> <b>위험</b>
<ul style="list-style-type: none"> <li>بعد رأسك بعيداً عن الدخان.</li> <li>استعمل التهوية أو جهاز ضبط الدخان للخارج.</li> <li>لكي تبعد الدخان عن المنطقة التي تتنفس فيها.</li> </ul>	<ul style="list-style-type: none"> <li>قطع التيار الكهربائي قبل القيام بأية مساعدة.</li> </ul>	<ul style="list-style-type: none"> <li>لا تشعل هذا الجهاز اذا كانت الاخطية الجديدة الواقعية ليست عليه.</li> </ul>	<span>Arabic</span> <b>تحذير</b>

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

使う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銀桿材料，並請遵守貴方的有關勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأً بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.