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PLASMA 40HF INVERTER PLASMA CUTTER OPERATION INSTRUCTIONS



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Thank you for selecting the R-Tech Plasma 40HF Inverter Plasma Cutter

The Plasma 40HF has many benefits over traditional transformer plasma cutters, including infinite power control, HF pilot start and HF pilot restart which is ideal for cutting mesh etc , quick fitting cost effective torch, long life cost effective torch consumables and a 60% industrial duty cycle

We want you to take pride in operating our Plasma 40HF as much pride as we have taken in making this product for you. Please read all information in this manual before operation

PLEASE EXAMINE THE 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 the data plate at rear of machine.

Product: Plasma 40HF

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.

This product is covered by a 2 year parts and labour warranty; we will cover cost of collecting and returning the item to you. External items, (torch, earth lead etc...) are covered by a 3 month warranty. Any faults/damage found caused by a customer will be charged accordingly.

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 following to avoid a minor personal injury or damage to this equipment.

Introduction

The R-Tech Plasma 40HF is a member of our field acclaimed family of welding products.

Premium features include:-

1. Inverter power source – more efficient to operate, provides smoother weld characteristics.
2. Infinite cutting power adjustment, allows fine tuning of cut characteristics
3. HF Pilot start – Enables easy arc start even on painted surfaces
4. HF pilot arc restart – ideal for cutting mesh etc
5. Digital amp meters
6. Quick fitting torch for easy torch fitment/replacement
7. Long life – Low cost torch consumables
8. 60% Duty cycle at 40 Amps @ 40°C

Recommended Processes

The R-Tech Plasma 40HF is recommended for the plasma cutting processes within its output capacity of 40 Amps DC

Equipment Limitations

The R-Tech Plasma 40HF is protected from overloads beyond the output ratings and duty cycle as per machine specifications with thermostat protection of the output coils and rectifiers.

Cutting Capability – Duty Cycle

The R-Tech Plasma 40HF is rated at 40 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.

Technical Specifications

MODEL	PLASMA 40HF
Power Voltage	220/240V 50/60Hz
Input Current	28A
Rated Output Current	40A
Current Adjusting Range	20-40A
No-load Voltage	200V
Rated Duty Cycle	60%
Working Mode	HF Start
Air Pressure	50 PSI
Max. Cutting Thickness (Clean cut mild steel)	12mm
Max. Cutting Thickness (Severance cut mild steel)	16mm
After Flow Time	10 Seconds
Dimensions	390 X 190 X 290

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 plasma cutter where clean cooling air can freely circulate in and out of the front & rear louver vents. Dirt, dust or any foreign material that can be drawn through vents into plasma cutter 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 plasma cutter. An abundance of conductive material can cause plant failure.

Stacking

This machine cannot be stacked.

Transport – Unloading

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



WARNING!

Falling Equipment can cause injury. Never lift plasma cutter with gas bottle attached. Never lift above personnel.

Tilting

Machine must be placed on a secure level surface or on a recommended undercarriage/trolley. This machine may topple over if this procedure is not followed.

Environmental Rating

The plasma power source carries the IP21S rating. It may be used in normal industrial and commercial environments. Avoid using in areas where water / rain is around.

Electrical Installation



ELECTRIC SHOCK CAN KILL

Machine grounding and High Frequency Interference Protection

This plasma cutter 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 welder power source
2. Direct interference from the welding 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 welder 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 welding 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.

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 welder inrush currents even if cutting at low amperages.

Failure to follow these instructions can cause immediate failure within the welder 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 Plasma 40HF Plasma Cutters require a 240V 50/60Hz 1-Phase supply. It requires an 32A supply. It comes with a 3 metre mains cable attached.

Connect wires according to national coding.

Brown wire – Live

Blue wire – Neutral

Green/Yellow Wire – Earth (Ground)

Connecting to a mains electrical supply

**THIS MACHINE IS OF AN INDUSTRIAL SPECIFICATION AND MUST BE
FITTED TO A 32AMP 240V MAINS INPUT**

**DO NOT RUN ON 13AMP PLUG – FAILURE TO RUN ON CORRECT SUPPLY
WILL IN-VALIDATE WARRANTY**

Connecting to an Engine Driven Generator

**If connecting this Plasma Cutter to an engine driven generator please
ensure the following**

Minimum Generator KVA Output – 8KVA 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 in-
validate your warranty.**

Connections for Plasma 40HF

Rear Machine connections

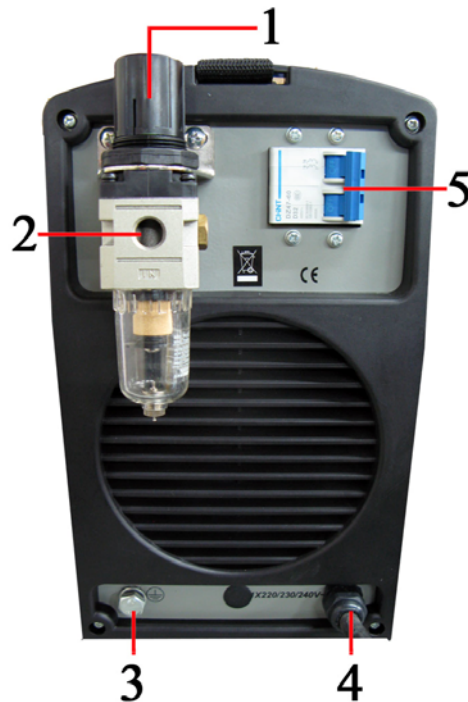


Fig 1

1. **Air pressure regulating knob**

This regulates the air pressure as displayed in gauge on front of machine.

To adjust pressure pull knob upwards and turn to adjust pressure, once correct pressure is obtained press down knob to secure.

2. **Air pressure input**

Screw supplied PCL fitting into regulator ensuring no air leaks

You can also fit other connectors to suit your needs

3. **2nd Earth connection**

This can be used to earth the machine to workbench if you are experiencing

interference from the HF – Sometimes required when using CNC automated machinery

- Not normally used

4. **Mains input cable**

Fit required plug as per your electrical installation

5. POWER On/Off Switch

Turns machine on and off, the switch illuminates when machine turn on

Front machine connections

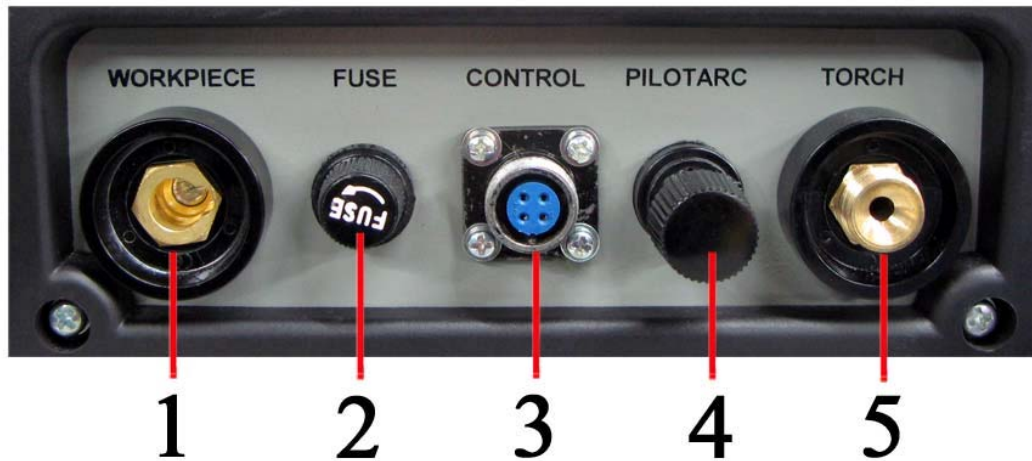


Fig 2

1. **Earth / Workpiece connector**
Connect the earth lead (negative -) to this connector. Insert male connector into socket and twist clockwise until tight. Secure other end of earth lead to Workpiece via the earth clamp.
2. **FUSE**
pilotarc fuse
3. **Torch switch socket**
Connect the torch switch plug (4 pin) and screw on retaining ring to secure
4. **Pilot lead connector**
Connect the ring terminal from torch. Un-screw retainer, fit ring terminal onto shaft and refit retainer ensuring it is tight
5. **Torch power connector**
Connect the main torch cable by screw clockwise until tight.

Controls and Settings

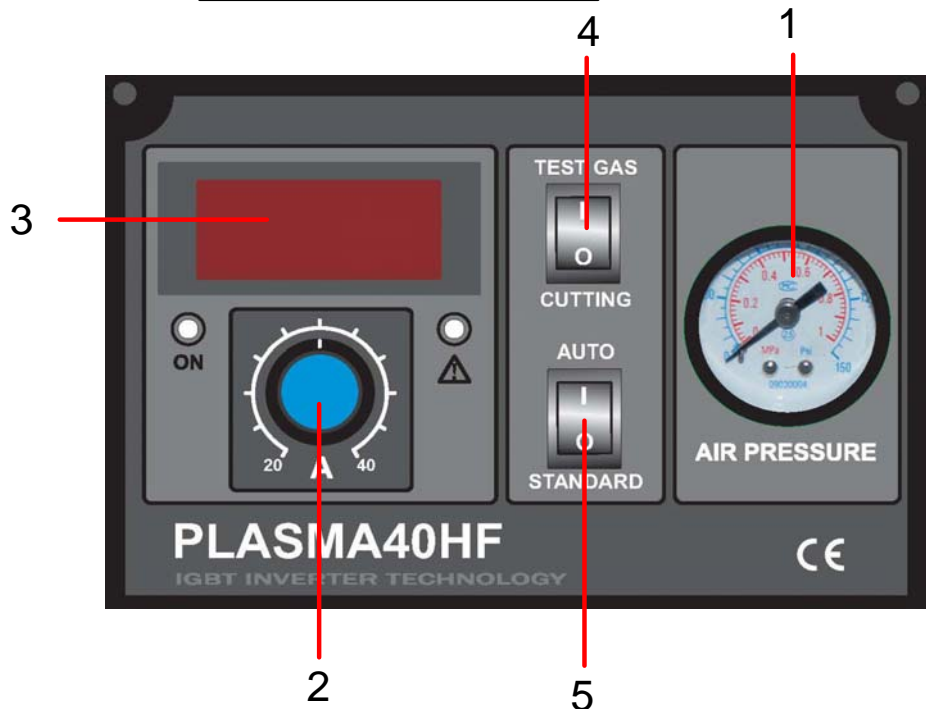


Fig 1

1. Air pressure gauge

This shows the air pressure as set by regulator at rear of machine.

This should be set to 50PSI when the test gas button is activated.

2. Amperage control knob

This adjusts the amperage (cutting power) from 20 to 40 amps

Note: LED display will show cutting amperage when you are cutting

3. L.E.D amperage display

When cutting this shows the actual cutting amperage

4. Test Gas / Cutting selector switch

When in the up position this is test gas mode, when setting air pressure switch to test gas so you obtain actual air flow cutting pressure

When in the down position this is cutting mode, you can now start cutting

5. Auto / Standard switch

When in the down position this is in standard cutting mode, this is the normal operating position for plasma cutting with a hand held and machine type torch

When in the up position this is in auto mode, this is for special applications when using automated machinery. Not normally used

Operating machine

SAFETY PRECAUTIONS



WARNING!

ELECTRIC SHOCK CAN KILL

**Do not touch electrically live parts or electrode with skin or wet clothing.
Insulate yourself from work and ground
Always wear dry insulating gloves**



WARNING!

FUMES AND GASES can be dangerous

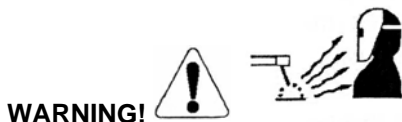
**Keep your head out of fumes & gases produced from welding.
Use ventilation or exhaust to remove fumes & gases from breathing zone and general area.**



WARNING!

WELDING SPARKS can cause fire or explosion

**Keep flammable material away from work area.
Do not weld on containers that have held combustibles**



WARNING!

ARC RAYS can burn

Wear eye, ear and body protection – Make sure work area is protected by proper shielding to avoid injury to passers by.

Operating Machine

Please ensure all torch consumables are tight before use

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. Set the function switch in the 'test gas' position, air will flow from torch head, now set the air pressure in gauge using adjuster on regulator on rear of machine to 50PSI

Once the correct air pressure has been set press down the adjuster on air regulator and set the function switch to the 'cutting' position

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 (the following guide lines will vary in accordance to material grade, characteristics and user operation)

20 Amps for up to 6mm on mild steel
 30 Amps for up to 9mm on mild steel
 40 Amps for up to 12mm on mild steel

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.

7. 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.

If you ever have any questions on settings call us and speak to one of our experienced technicians who will be happy to help you.

Replacing torch consumables



Please ensure machine is turned off before changing consumables

If cutting performance is poor you probably need to check / change the torch consumables.

To change the plasma cutting consumables carry out the following procedure

1. Switch off machine
2. Ensure torch has cooled down to avoid burns
3. Unscrew the pink ceramic shroud
4. Remove the silver cutting tip
5. Check the condition of cutting electrode, replace cutting electrode if tip is worn 1-2 mm and end is concave
6. Fit new cutting electrode by screwing in and tweaking with pair of pliers – Do not over tighten as this will cause thread / torch head damage
7. Fit new cutting tip by screwing in and tweaking with a pair of pliers – Do not over tighten as this will cause thread / torch head damage
8. Refit pink ceramic cup by screwing on hand tight
9. Turn machine back on and continue cutting

Maintenance

Routine and periodic maintenance



WARNING!

ELECTRIC SHOCK CAN KILL

Turn the input power OFF at the mains switch & fuse box and remove mains plug from socket before working on this equipment.

Have a qualified electrician install & service this Plasma cutting equipment.

Allow machine to sit for 5 minutes minimum after disconnection from mains power to allow the power capacitors to discharge before working inside this equipment.

Do not touch electrically live parts

1. Periodically (3-6 months depending on use / environment), remove the side/top panels of machine and clean out machine with a low pressure dry air line paying particular attention to PC Boards, Fan blades and switchgear

Failure to maintain plant can void manufacturers warranty.

2. Inspect input and output cables & hoses for fraying and cuts, replace if damaged present
3. Keep cutting torch and earth cables in good condition
4. Clean air vents to ensure proper air flow and cooling
5. The fan motor has sealed bearings which requires no maintenance

FAULT DIAGNOSTICS

1. Power light not lit

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

Check Input power to machine

Check plug wiring

Check mains trip / fuses

2. No output - Fan runs - Power light is lit

Check torch connections are secure and torch switch operation, try replacing plasma cutting torch

3. No output - Power light is lit - Warning light is lit

Welding application may have exceeded recommended duty cycle, allow machine to cool down until the warning light goes out.

4. No output – Power light is lit – Air at torch tip – No Pilot Arc

Check condition of torch consumables and replace if worn

Check pilot arc protecting fuse on front panel of machine and replace if blow – If fuse keeps blowing contact R-Tech for repair / replacement torch

Please ensure machine is switched off before checking fuses

Check for water in water trap at rear of machine, if water is present, drain air compressor, clean water out of air lines, empty water trap by pressing water release button on bottom of air regulator water trap. Fit new consumables as per instructions earlier in this manual

HF PCB Failure – Contact R-Tech for repair

5. Machine keeps overheating - Warning light is lit on machine

Check if fan is running – if not contact R-Tech for repair

Check the cooling vents for obstruction, blow out machine with clean dry low pressure air supply. Check for adequate ventilation around machine

6. Erratic cut – Torch spitting when cutting

Check torch consumables and replace if necessary as per instructions earlier in this manual

Check if correct amperage for thickness of metal, if too slow travel speed or too much cutting power, increase speed of cut or reduce cutting amperage. (When machine senses no metal left to cut it will switch off main cutting power and switch on HF pilot arc, this is the HF pilot arc restart)

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, empty water trap by pressing water release button on bottom of air regulator water trap. Fit new consumables as per instructions earlier in this manual

Plasma Torch Consumables parts list

R-Tech Torch Spares

Plasma 40HF

Electrode
Cutting Tip 1.0mm 40 Amp
Ceramic Cup
Spring, Stand off

Torch Head –Hand Held
Torch Complete Hand Held 6M

Part No.

P40-EL
P40-CT1
P40-CC
P40-SS

P40-THH
P40-6MHHT

Plasma 60,80,100 HF

Electrode
Cutting tip 0.8mm 30 Amp
Cutting tip 1.1mm 60 Amp
Cutting tip 1.3mm 80 Amp
Cutting tip 1.5mm 100 Amp
Shroud

P60100-EL
P60100-CT08
P60100-CT11
P60100-CT13
P60100-CT15
P60100-SH

Torch Head hand held

P60100-THH

Torch Head Machine
Torch Complete 6m Hand Held
Torch Complete 6m Machine type

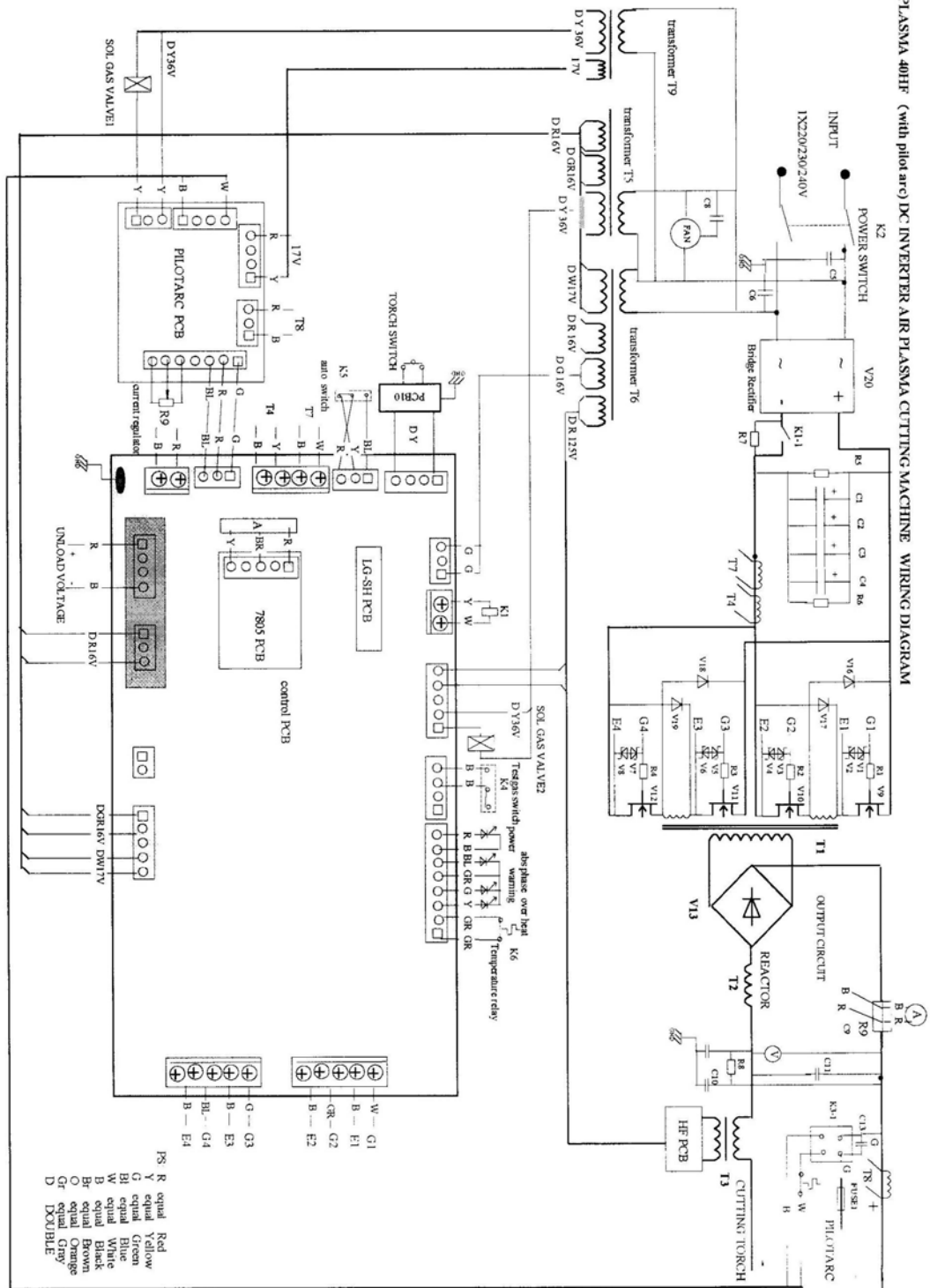
P60100-THM
P60100-6MHHT
P60100-6MMTT

Plasma torch switch

TS1

Wiring Diagram

PLASMA 40HF (with pilot arc) DC INVERTER AIR PLASMA CUTTING MACHINE WIRING DIAGRAM



			
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 o los electrodos bajo carga con la piel o ropa mojada. Aíselese 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"> Protégase 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. Isolez-vous du travail et de la terre. 	<ul style="list-style-type: none"> Gardez 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. Isole-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、又は溶材にヒフやぬれた布で触れないこと。 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。 	<ul style="list-style-type: none"> 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。 	<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"> 皮肤或湿衣物切勿接触带电部件及焊條。 使你自己與地面和工件絕緣。 	<ul style="list-style-type: none"> 把一切易燃物品移離工作場所。 	<ul style="list-style-type: none"> 佩戴眼、耳及身體勞動保護用具。
Korean 위험	<ul style="list-style-type: none"> 전도체나 용접봉을 젖은 형갑 또는 피부로 절대 접촉치 마십시오. 모재와 접지를 접촉치 마십시오. 	<ul style="list-style-type: none"> 인화성 물질을 접근시키지 마십시오. 	<ul style="list-style-type: none"> 눈, 귀 및 몸에 보호장구를 착용하십시오.
Arabic تحذير	<ul style="list-style-type: none"> لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجند الجسم أو بالمعلايس المبللة بالماء. ضع عازلا 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.