



CORNWELL[®]
QUALITY TOOLS

MMW220PC

OWNER'S MANUAL



12/2015



WARNING:

Read carefully and understand all **ASSEMBLY AND OPERATION INSTRUCTIONS** before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.

Effective December 22, 2015

LIMITED WARRANTY FOR MMW220PC

This warranty applies to the original purchaser and is subject to the terms and conditions listed below. This Limited Warranty is for new equipment sold after the above date, providing coverage for defects in material and workmanship at the time it is shipped from the factory.

Limited to the warranty periods below, Cornwell Quality Tools will repair or replace the item under warranty that fails due to defects in material and workmanship. Cornwell Quality Tools must be notified within 30 days of the failure, so as to provide instructions on how to proceed with the repair of your welder and warranty claim processing. Warranty period begins at the time the welder is purchased from and Authorized Cornwell Distributor. **Keep your receipt as proof of purchase.**

Warranty Periods

Limited Warranty is divided into three categories. No Warranty, 1 year and 2 year.

No Warranty

Normal wear items such as plasma torch parts (nozzle, electrode, diffuser, cover) are considered consumable items and are not covered under warranty.

1 year

This warranty covers the existence of manufacturing defects in the plasma torch and the parts and labor associated with those defects. This warranty does not cover damage, such as cuts in cabling, crushing, or any other damage that is a result of incorrect use of the torch. This warranty also does not cover the normal wear items as stated above in the No Warranty section.

Any shipping related to warranty repair is the responsibility of the customer.

2 year

This warranty covers parts and labor on items such as: transformer, reactor, rectifier, solenoid valve, PC Board, switches, controls, gas valve, and any other component that requires the removal of the sheet metal to access; except for the plasma torch itself as outlined in the 1 year warranty above. Any shipping related to warranty repair is the responsibility of the customer.

Voiding Warranty

Warranty does not apply to: Shipping Damage, Misuse and abuse of the unit, alteration of the unit in any way.

Warranty Claim

This is a parts and labor warranty. **Contact your Cornwell distributor you purchased it from.** Retain your receipt in the case a warranty claim is needed. No warranty will be provided without the original receipt from an authorized Cornwell Distributor. To make a warranty claim, contact your Cornwell Distributor. That Cornwell Distributor will contact the customer service department for warranty instructions.

GENERAL SAFETY RULES



WARNING: Read and understand all instructions. Failure to follow all instructions listed below may result in serious injury.



CAUTION: Do not allow persons to operate or assemble this plasma cutter until they have read this manual and have developed a thorough understanding of how this plasma cutter works.



WARNING: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions or situations that could occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

SAVE THESE INSTRUCTIONS

IMPORTANT SAFETY CONSIDERATIONS

1.1 Your Welding/Cutting Environment

- Keep the environment that you will be welding/cutting in free from flammable materials.
- Always keep a fire extinguisher within reach.
- Always have a qualified person install and operate this equipment.
- Make sure the area is clean, dry and well ventilated. Do not operate the plasma cutter in humid, wet or poorly ventilated areas.
- Always have your plasma cutter maintained by a qualified technician in accordance with local, state and national codes.
- Always be aware of your work environment. Be sure to keep other people, especially children, away from you while you are cutting.
- Keep harmful arc rays shielded from the view of others.
- Mount the plasma cutter on a secure bench or cart that will keep the welder secure and prevent it from tipping over or falling.

1.2 Your Plasma Cutter's Condition

- Check all cables, power cord and torch to be sure the insulation is not damaged. Always replace or repair damaged components before using the plasma cutter.
- Check all components to ensure they are clean and in good operating condition before use.

1.3 Use of Your Plasma Cutter

CAUTION

Do not operate the plasma cutter if the torch is wet. Do not immerse the plasma torch. Do not stand in water while using this plasma cutter. These components and the plasma cutter must be completely dry before attempting to use it.

- Follow the instructions in this manual.
- Keep the plasma cutter in the off position when not in use.

- Connect ground lead as close to the area being cut as possible to ensure a good ground.
- Do not allow any body part to come in contact with the material being cut, or to the ground or electrode from another plasma cutter or welder.
- Do not cut if you are in an awkward position. Always have a secure stance while cutting to prevent accidents. Wear a safety harness if working above ground.
- Do not drape cables over or around your body.
- Wear eye protection (see ANSI Z49.1 safety standard) while cutting to protect your eyes from harmful UV and IR ray's.
- Wear proper gloves and protective clothing to prevent your skin from being exposed to hot metals, UV and IR rays.
- Do not overuse or overheat your plasma cutter. Allow proper cooling time between duty cycles.
- Keep hands and fingers away from moving parts.
- Do not point the Plasma torch at any body part or at anyone else.
- Always use this plasma cutter in the rated duty cycle to prevent excessive heat and failure.

1.4 Specific Areas of Danger, Caution or Warning



Electrical Shock

▲ WARNING

Plasma cutters can produce a shock that can cause injury or death. Touching electrically live parts can cause fatal shocks and severe burns. While cutting, all metal components connected to the wire are electrically hot. Poor ground connections are a hazard, so secure the ground lead before cutting.

- Wear dry protective apparel: coat, shirt, gloves and insulated footwear.
- Insulate yourself from the work piece. Avoid contacting the work piece or ground.
- Do not attempt to repair or maintain the plasma cutter while the power is on.
- Inspect all cables and cords for any exposed wire and replace damaged or wore cables immediately.
- Use recommended replacement cables and cords.
- Always attach the ground clamp to the work piece or work table as close to the cutting area as possible.
- Do not touch the torch and the ground or grounded work piece at the same time.



Fumes and Gases

▲ WARNING

- Fumes emitted from the plasma cutting process displace clean air and can result in injury or death.
- Do not breathe in fumes emitted by the plasma cutting process. Make sure your breathing air is clean and safe.
- Work only in a well-ventilated area or use a ventilation device to remove plasma cutting fumes from the environment where you will be working.
- Do not plasma cut on coated materials (galvanized, cadmium plated or containing zinc, mercury or barium). They will emit harmful fumes that are dangerous to breathe. If necessary use a ventilator, respirator with air supply or remove the coating from the material in the area to be cut.
- The fumes emitted from some metals when heated are extremely toxic. Refer to the material safety data sheet for the manufacturer's instructions.
- Do not weld/cut near materials that will emit toxic fumes when heated. Vapors from cleaners, sprays and degreasers can be highly toxic when heated.



UV and IR Arc Rays

▲ DANGER

The plasma cutting arc produces ultraviolet (UV) and infrared (IR) rays that can cause injury to your eyes and skin. Do not look at the plasma cutting arc without proper eye protection.

- Always use safety glasses, a shield or a helmet that meets ANSI Z49.1 standards for plasma cutting.
- Cover all bare skin areas exposed to the arc with protective clothing and shoes. Flame-retardant cloth or leather shirts, coats, pants or coveralls are available for protection.
- Use screens or other barriers to protect other people from the arc rays emitted from your plasma cutting arc.
- Warn people in your cutting area when you are going to strike an arc so they can protect themselves.



Fire Hazards

▲ WARNING

Do not cut on containers or pipes that contain or have had flammable, gaseous or liquid combustibles in them. Plasma cutting creates sparks and heat that can ignite flammable and explosive materials.

- Do not operate any plasma cutter in areas where flammable or explosive materials are present.
- Remove all flammable materials within 35 feet of the plasma cutting arc. If removal is not possible, tightly cover them with fireproof covers.
- Take precautions to ensure that flying sparks do not cause fires or explosions in hidden areas, cracks or areas you cannot see.
- Keep a fire extinguisher close in the case of fire.
- Wear garments that are oil-free with no pockets or cuffs that will collect sparks.
- Do not have on your person any items that are combustible, such as lighters or matches.
- Keep the work lead connected as close to the plasma cutting area as possible to prevent any unknown, unintended paths of electrical current from causing electrical shock and fire hazards.



Hot Materials

▲ CAUTION

Plasma cut materials are hot and can cause severe burns if handled improperly.

- Do not touch plasma cut materials with bare hands.
- Do not touch torch tip after cutting until it has had time to cool down.



Sparks/Flying Debris

▲ CAUTION

Plasma cutting creates hot sparks that can cause injury. Chipping slag off cuts can create flying debris.

- Wear protective apparel at all times: ANSI-approved safety glasses or shield, a welder's hat and ear plugs to keep sparks out of ears and hair.



Electromagnetic Field

▲ CAUTION

Electromagnetic fields can interfere with various electrical and electronic devices such as pacemakers.

- Consult your doctor before using any plasma cutting device
- Keep people with pacemakers away from your plasma cutting area while cutting.
- Do not wrap cable around your body while plasma cutting.
- Wrap plasma torch cable and ground cable together whenever possible.
- Keep plasma torch and ground cables on the same side of your body.



Shielding Gas Cylinder Can Explode

▲ WARNING

High pressure cylinders can explode if damaged, so treat them carefully.

- Never expose cylinders to high heat, sparks, open flames, mechanical shocks or arcs
- Do not touch cylinder with plasma torch.
- Do not plasma cut on the cylinder.
- Always secure cylinder upright to a cart or stationary object
- Keep cylinders away from welding/cutting or electrical circuits.
- Use the proper regulators, gas hose and fittings for the specific application



Proper Care, Repair and Maintenance

▲ WARNING

Always have power disconnected when working on internal components.

- Do not touch or handle PC board without being grounded with a wrist strap. Put PC board in static proof bag to move or ship.



- Do not put hands or fingers near moving parts such as drive or fan.

Proposition 65 Warnings

▲ WARNING

Plasma cutting equipment produces fumes or gases which contain chemicals known to the state of California to cause birth defects and, in some cases, cancer. (California Health & Safety code section 25249.5 et seq.)

MMW220PC USE AND CARE

- **Do not modify this unit in any way.** Unauthorized modification may impair the function and/or safety and could affect the life of the equipment. There are specific applications for which this unit was designed.
- **Always check of damaged or worn out parts before using this unit.** Broken parts will affect this unit's operation. Replace or repair damaged or worn parts immediately.
- **Store idle MMW220PC.** When this unit is not in use, store it in a secure place out of the reach of children. Inspect it for good working condition prior to storage and before re-use.

TECHNICAL SPECIFICATIONS

Item	Description
Power Supply	230V, 25A, 60 HZ, Single Phase
No-Load Voltage	340 Volts DC
Output Range	15 – 40 Amp DC
Duty Cycle	35% @ 40A
Air Pressure	4.5 CFM @ 60 PSI
Plasma Torch	11 ft., 8 in. Trafimet Brand Torch
Dimensions	15" x 12" x 6"
Weight	19.2 lbs.

DESCRIPTION

The MMW220PC is an inverter powered 230 V input, 15-40 amp adjustable output plasma cutter that cuts mild steel up to 3/8" making it a versatile tool for any automotive shop. It cuts all electrically conductive materials. See chart below. It cuts a narrow kerf that results in a smaller heat affected zone for reduced warping. The MMW220PC is lightweight (19.2 lbs.), compact, inverter design for greater portability. It has a pilot arc for easy starts and enables the user to cut fence or expanded metal. This unit has a built in air pressure adjustment and gauge, indicator lights for quick trouble shooting and thermal overload protection. The electrode, nozzle, swirl ring and protective cap are consumable items and available through your Cornwell distributor.



GAS PRESSURE DISPLAY

The built-in gas display is used for reading the output gas pressure when cutting.

GAS PRESSURE ADJUSTOR

Used to adjust the gas pressure. The gas pressure can be read from the gas pressure display on the front panel. Normally, the pressure should be adjusted between 55-90psi.

POWER INDICATOR LIGHT

This light will turn on when the input power cord is plugged into the power supply and the power switch on the back of the plasma cutter is in the "ON" position.

WORK INDICATOR

The work indicator will light when the torch trigger is pulled, indicating cutting current is activated.

PROTECTION INDICATOR LIGHT

When the unit is in thermal overload, is over voltage or lacking voltage, the indicator will be on and cutting output will stop. Leave the unit on. When the unit is cooled down and/or voltage stabilizes, the Protection Indicator Light will turn off and the unit will automatically start output again.

LOW GAS INDICATOR LIGHT

This light will be on when the gas pressure or flow is low.

CURRENT ADJUSTMENT

Variable adjust the output cutting current. The higher output matches the thicker metal. The maximum cutting thickness is up to 3/8" for this unit. Please note that the maximum cutting thickness varies depending on the material type you are cutting. See the following table for reference.

Material	Clean Cut
Mild Steel	3/8"
Stainless Steel	1/4"
Galvanized	1/4"
Aluminum	1/4"
Copper	1/8"
Brass	1/8"

GROUND CABLE AND CLAMP

The ground cable clamp connects to your work piece completing the electrical circuit. Without a clean, rust and paint free connection, the arc will not transfer from Pilot Arc to Cutting Arc.

PLASMA TORCH AND CABLE

The torch delivers compressed are and output power that is needed to create the plasma arc.

GAS HOSE CONNECTION

The gas hose connection is on the back panel of the plasma cutter. This connection requires a 1/4 inch NPT connection (Not supplied). The other end of the gas hose connects to an air compressor or compressed air supply. We recommend the use of an air dryer when possible.

POWER SWITCH

The Power Switch allows input power to the machine components. After the machine is connected to the input power supply, turn on this switch. The power indicator on the front panel will turn on.

POWER CORD AND PLUG

Plug this unit into a 120V, 20 amp circuit breaker power supply.

INSTALLATION

1. POWER REQUIREMENT

AC single phase 230V 60HZ fused with a 50 amp time delayed fuse or circuit breaker is required. DO NOT OPERATE THIS UNIT if the ACTUAL power source voltage is less than 210 volts AC or greater than 240 volts AC.

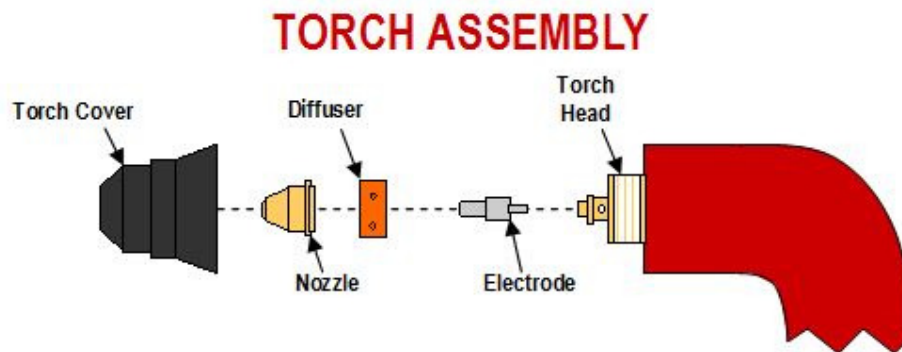
▲ WARNING

- **High voltage danger from power source! Consult a qualified electrician for proper installation of receptacle. This cutter must be Grounded while in use to protect the operator from electrical shock.**
- **Do not remove grounding prong or alter the plug in any way. Do not use any adapters between the cutter's power cord and the power source receptacle. Make sure the POWER switch is OFF when connecting your cutter's power cord to a properly grounded 230 VAC, 60Hz, 1 phase, 50 amp input power supply.**

2. EXTENSION CORD - We do not recommend an extension cord because of the voltage drop they produce. This drop in voltage can affect the performance of the welder. If you need to use an extension cord, we recommend you check with a qualified electrician and your local electrical codes for your specific area. Do not use an extension cord over 25 ft. in length.

3. INSTALLATION OF THE CUTTING TORCH CONSUMABLES

3.1 Your torch should be fully assembled and ready to operate. The below figure shows the components of the torch head and how those components are installed.



3.6 Connect the Ground Clamp to your workpiece.

3.7 Connect your compressed air source to the gas connection on this units back panel.

OPERATION

▲ WARNING

High voltage danger from power source! Consult a qualified electrician for proper installation of receptacle at the power source. This cutter must be grounded while in use to protect the operator from electrical shock. If you are not sure if your outlet is properly grounded, have it checked by a qualified electrician. Do not cut off the grounding prong or alter the plug in any way and do not use any adapters between the cutter's power cord and the power source receptacle. Make sure the POWER switch is OFF then connect your plasma cutter's power cord to a properly grounded 230 VAC (220v-240v), 60Hz, single phase, 50 amp power source.

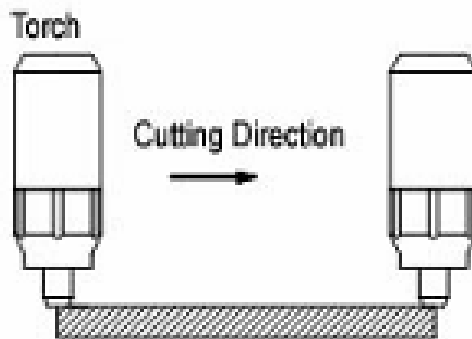
1. SET UP

- Check the plasma cutter to see if it has been connected correctly and is in good working condition as described in INSTALLATION Section and that it complies with safe operation requirements as noted in the IMPORTANT SAFETY CONSIDERATIONS Section.
- Switch on the power switch of the cutter to observe if the operation is normal. If it is normal, the fan should start up and the Power Indicator Light should be on. If there is no compressed air or the air pressure is low the Low Pressure Indicator Light will be on.
- Adjust the air supply valve until the air pressure is up to the cutting torch requirement. (Lowest pressure should be no less than 50PSI), the Low Pressure Indicator Light will not be lit up in those conditions.
- Adjust the air flow to be sure it is consistent.
- Pull the torch trigger. The cutting operation begins after the cutting plasma pilot arc is made.

2. CUTTING OPERATION

2.1. Metal Sheet Cutting

- Put the torch's nozzle at the start of the work piece. Turn on the torch switch to ignite the plasma pilot. After the work piece is cut through, move the torch along the cutting direction uniformly. The cutting speed is determined by watching to see if the cutting goes all the way through. If the speed is too fast, the work piece won't be cut thorough, or if too slow, the cut quality would be affected, excessive warping may occur, or the arc could stop.
- When you've completed the cutting process, turn off the torch; the plasma pilot arc will stop.



2.2. Metal Mesh Cutting

- Fix the work piece and connect the earth cable with the work piece.
- Put the cutting nozzle onto the work piece, lift torch up slightly from the work piece and turn on the switch to cut.

2.3. Notice while cutting

- Unnecessary igniting of the pilot arc in the air will reduce the life-span of the torch's electrode and nozzle.
- It is best to start cutting at the edge of the work piece, unless you are piercing the work piece.
- Keep a space between the nozzle and the work piece. Pressing the nozzle on the work piece could cause the nozzle to stick, reducing the smoothness of the cutting action creating an undesirable result.
- Keep the torch's nozzle vertical against the work piece, and watch to be sure the arc is moving along the cutting line.
- Do not rapidly switch the torch trigger on and off; this will damage the pilot arc system and work piece.
- The plasma cutter's working air pressure range is 50-90psi. Notice: the internal pressure switch will shut off when the air pressure falls below 50psi. The switch only works when the pressure rises to 50psi or above.
- Every 4-8 hours, check the air filter on your air supply and remove excess moisture. Too much moisture in the cutter or torch may lead to operational trouble.

▲WARNING Always unplug the power supply before checking for and removing moisture.

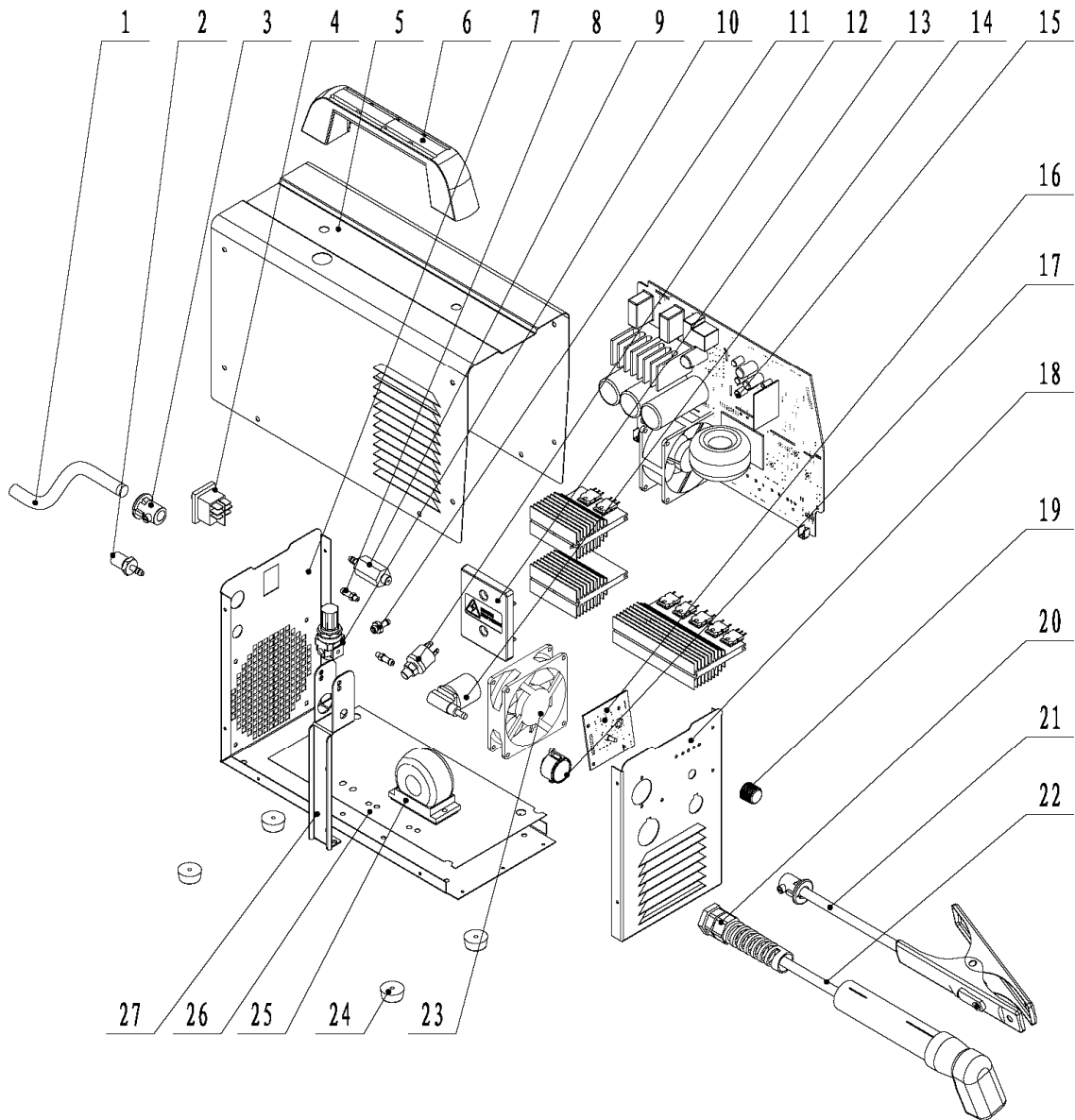
4. Safety Requirements

- Never allow the torch to be aimed at any part of a body.
- Make sure to wear protective glasses and gloves while operating.
- Work only in well-ventilated areas. If necessary, use exhaust/ventilation fans to keep fumes or emissions away from the breathing zone.
- Do not touch the work piece while cutting.
- Do not cut a pipes, containers, or other materials that contain, or have ever contained, flammable or explosive materials.
- Do not work underwater or in wet/moist environments.
- Do not bend the torch cable sharply; this may damage the air hose.
- Nobody other than the operator should be allowed to access the working area.
- Always turn off the power supply prior to repairing or moving the machine.
- Always turn off the power supply prior to repairing or installing any spare parts (e.g., torch, electrode, nozzle, ground clamp, etc.).
- Never allow a person with a cardiac pacemaker close to the working area without the permission of a doctor. The magnetic field produced by plasma cutters during operation can disrupt pacemakers and similar devices.
- Do not allow the ground cable to be pinched or damaged. If damaged, replace immediately.
- Never clean the slag off the torch head by hitting it against a hard object.

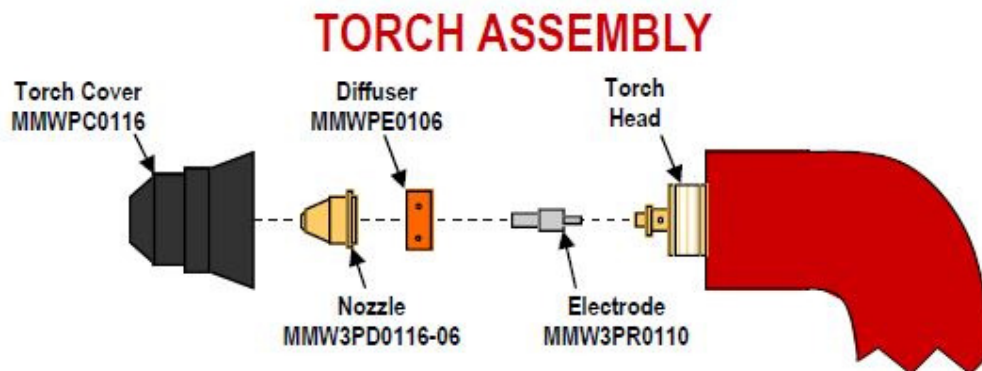
TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Unit Does Not Power Up	Unit Is Not Plugged In	Plug In Unit
	Input Power Circuit Breaker Not On	Reset Input Power Circuit Breaker
	Main Power Switch Is Defective	Replace Main Power Switch
No Pilot Arc	Low Air Supply Pressure	Check Air Supply
		Adjust Gas Pressure Adjuster So The Gas Pressure Display Reads A Minimum Of 60 PSI
	Protection Indicator Is On Indicating The Machine Is In Protection Mode	See Protection Indicator Is On section below.
	Missing Torch Head Components	Replace Missing Torch Head Components. See the INSTALLATION OF THE CUTTING TORCH CONSUMABLES section.
	Plasma Torch Trigger Not Communicating with the unit	Pull the trigger. If the work light is not on, the torch is not communicating with the machine. Check Trigger Connection.
		Replace or Repair Torch
Plasma Torch May Be Defective	See if electrode in torch head is spring loaded. If it is not, the torch head has seized and the torch will need to be replaced. Install an air dryer to your compressed air supply to prevent corrosion of the torch head.	
Arc Start Circuit Defective	For Assistance, Contact Metal Man Work Gear at 888-762-4045	
Have Pilot Arc, but cutting arc does not ignite.	Work Piece is Painted Or Rusty	Remove All Paint And Rust
	Ground Clamp Is Connected Where There Is Paint Or Rust	Remove All Paint And Rust So Ground Clamp Is Connected To Bare Metal
	Ground Clamp Is Not Electrically Connected To The Work Piece	Make Certain The Ground Clamp Is Connected To The Work Piece
Protection Indicator Is On	The internal temperature is too high.	Leave power on and let the fan cool the unit. Output will continue when the unit has cooled.
	Input Power Voltage is Too High or Too Low.	Meter Input Power Voltage. This unit must be used with input voltage that ranges from 220V-240V AC
	Voltage Protection Range Is Incorrect	If your metered power is in the range of 220V - 240V AC, the voltage protection range may be incorrectly set. This can be adjusted on the main PC Board. Component VR102 can be turned counter-clockwise to lower the minimum input voltage threshold. Component VR101 can be turned clockwise to increase the maximum voltage threshold. Do not operate this unit when input voltage is less than 220VDC or over 240VDC
Cooling Fan is not working	Unit is not turned on	Turn On Unit
	Cooling fan defective	Replace the cooling fan
	Control Transformer Defective	Replace Control Transformer
For Assistance, Contact Metal Man Work Gear at 888-762-4045		

DIAGRAM & PARTS LIST



REFERENCE	PART NUMBER	DESCRIPTION	QTY
1	105400068	POWER CABLE	1
2	105400048	GAS CONNECTOR	1
3	105400049	CABLE STRAIN RELIEF	2
4	105400050	POWER SWITCH	1
5	155400001	ENCLOSURE	1
	155400005	TORCH PARTS LABEL	1
6	105400051	HANDLE	1
7	155400002	BOTTOM	1
8	105400052	BARBED GAS FITTING 1	2
9	105400053	AIR PRESSURE CONNECTOR	1
10	105400054	PRESSURE VALVE	1
11	105400055	BARBED GAS FITTING 2	1
12	105400056	PRESSURE SWITCH	1
13	105400057	SUPPORT	1
14	105400058	AIR SOLENOID	1
15	105400069	MAIN PCB	1
16	105400070	CONTROL PCB	1
17	105400061	PRESSURE DISPLAY GAUGE	1
18	155400003	FRONT PLATE	1
	155400007	PLASTIC FACE PLATE MMW220PC	1
19	105400071	POTENTIOMETER	1
20	105400062	TORCH STRAIN RELIEF	1
21	105400063	GROUND CABLE AND CLAMP	1
	105400043	GROUND CLAMP ONLY	1
22	105400064	PLASMA TORCH	1
23	105400072	FAN	1
24	105200024	FEET	4
25	105200065	INDUCTOR	1
26	105200066	BASE INSULATOR	1
27	105400067	REGULATOR SUPPORT ARM	1
	155400009	OPERATOR'S MANUAL MMW220PC	1



For replacement parts please call (800) 321-8356 .
 For Assistance, Contact Metal Man Work Gear at 888-762-4045.



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