

HTP MicroCut 875SC v2

Owner's Manual



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General Information

Thank you and congratulations on purchasing an HTP MicroCut 875SC v2. With many welding and cutting equipment options available on the market today, we appreciate your purchase, as well as the confidence you put into HTP through purchasing one of our products.

The versatile MicroCut 875SC v2 works with CNC plasma cutting tables —a first for HTP with the addition of our optional CNC interface and 20' machine torch. In fact, the HTP MicroCut 875SC v2 is the only plasma cutter in its class with a dedicated CNC mode, and the only plasma cutter in its class offering 100% duty-cycle in CNC mode. You can also operate the MicroCut 875SC manually with a 20' hand torch. If you purchased the 20' hand torch, you can always upgrade your machine to meet CNC plasma cutting table compatibility at a later date. As an added bonus, the hand torch and machine torch utilize the same consumables, apart from the shield cap, so you only need to keep on-hand and track-of a single style of replacement parts.

We hope you enjoy working with your new plasma cutting machine! If you need help setting up or operating your plasma cutter, at any time, please feel free to contact us.

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Manufacturer's Warranty

Subject to the terms and conditions hereof, HTP America, Inc. warrants that all MicroCut 875SC v2 plasma cutters furnished by HTP are free from defects in workmanship and material as of the time and place of delivery by HTP. No warranty is made by HTP with respect to trade accessories or other items manufactured by others. Such trade accessories and other items are subject to the warranties, if any, of their respective manufacturers only.

HTP shall be required to honor warranty claims on MicroCut 875SC v2 plasma cutters in the event of failure resulting from a defect within the following periods from the date of delivery of the MicroCut 875SC v2 to the original user, provided that HTP is notified in writing within thirty (30) days of the date of failure:

1) Plasma cutters, power sources, and components:	2 Years
2) Plasma torches:	90 Days
3) The shield cap, shield cup body, cutting tip, electrode, and swirl ring are consumable items and CARRY NO WARRANTY .	

As a matter of general policy only, HTP may honor claims submitted by the original user within the foregoing periods.

In the case of HTP's breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore shall be, at HTP's option, (1) repair or (2) replacement or, where authorized in writing by HTP in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized HTP service station upon return of the goods at the Customer's risk and expense. HTP's option of repair or replacement will be F.O.B., from the factory in Elk Grove Village, Illinois, therefore, no compensation for transportation costs of any kind will be allowed. Upon receipt of notice of apparent defect or failure, HTP shall instruct the claimant on the warranty claim procedures to be followed.

HTP America, Inc. has reserved the right to make changes in design or add any improvements to its products at any time without incurring any obligation to install the same on previously purchased equipment.

This warranty is null and void unless warranty registration is sent to HTP America, Inc. within fifteen (15) business days from the date of purchase.

Any express warranty not provided herein and any implied warranty, guarantee or representations as to performance, and any remedy for breach of contract which, but for this provision, might arise by implication, operation of law, custom of trade or course of dealing, including any implied warranty of merchantability or of fitness for particular purpose, with respect to any and all equipment furnished by HTP is excluded and disclaimed by HTP.

Note: This warranty is to the original purchaser only. The warranty can be transferred to another owner for a \$25 warranty transfer fee. HTP America, Inc. must be notified within fourteen (14) days of the sale and must be provided with the contact info of the original owner and the contact info of the new owner.

General Precautions & Safety Suggestions

HTP America values your safety and the safety of those around you. Please read, follow, and save the following safety precautions and operating instructions in order to maintain a safe work environment and to ensure proper handling of all equipment.

On Reading the Owner's Manual and Operating Instructions

• Thoroughly read the Owner's Manual and Operating Instructions prior to installing, operating, or servicing equipment.



Plasma Cutting Hazards

- Only allow qualified individuals to operate, maintain, and repair equipment.
- Maintain a dry working environment and protect all cords from water, oil, and grease.
- When not operating equipment, disengage power by turning off and unplugging equipment.
- Do not operate equipment with damaged parts; repair or replace damaged parts immediately.
- Do not operate equipment without all protective panels and covers in place. In fact, do not ever remove panels with equipment on and/or connected to a power supply.
- During operation, keep all individuals, other than the operator, away from the work area.



Risk of Electric Shock

- Do not touch live electrical parts; live electrical parts can cause electric shock, which results in serious injury, such as severe burns, or even death.
- When you power the equipment on, all circuits, including the input power circuit and equipment internal circuits, become live.
- Properly ground all equipment.
- Do not touch parts when in contact with the work or ground.

- Insulate yourself from the work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Wear dry, insulating gloves and body protection.
- Turn off power before checking, cleaning, or changing torch parts.
- Turn equipment off and disconnect from power supply before servicing.
- Inspect input power cord, plasma torch, and ground cable for damage or exposed wiring. If you detect exposed wiring, discontinue use and replace cord promptly.
- In order to reduce the risk of cord damage and electric shock, protect all cords from hot metal and sparks.
- Do not wrap torch cable around your body.



Significant DC Voltage Exists on Internal Parts of Inverter Power Sources Even After Removal of Input Power.

• The input capacitors should read zero (0) volts before you touch any parts. After turning off the power and disconnecting the equipment from the input power supply, test the voltage on the input capacitors according to the instructions in the Maintenance section of the Owner's Manual.



- Wear protective clothing to protect yourself from flying sparks and hot metal.
- Do not cut near flammable material. If possible, remove all flammables within 35 ft of the plasma cutting arc. If not possible, tightly cover flammables with approved covers.
- Sparks and hot materials can easily make their way to adjacent areas through small cracks and openings.
- Watch for fire and keep a fire extinguisher nearby.
- Cutting on ceilings, floors, bulkheads, and partitions can cause fire on the opposite side.
- Connecting the ground cable to the work as close to the cutting area as possible guards against the cutting current traveling long, unknown paths where the current can cause electric shock and fire hazards.
- Do not cut pressurized cylinders, pipes, or vessels.
- Do not cut on closed containers, such as tanks or drums.
- Do not cut containers holding flammable materials; containers must be emptied and properly cleaned prior to cutting.
- Do not cut containers that previously held combustibles.
- Do not cut near explosive dust or vapors.
- Do not place equipment on or near combustible surfaces.
- Remove combustibles, such as butane lighters and matches, from your person prior to operating equipment.



- Avoid touching hot parts with bare skin; hot parts can cause burns.
- Always allow equipment to cool before servicing.
- Always allow the torch to cool before replacing consumables.

• Wear protective clothing and insulated welding gloves, or use proper tools, if you must handle hot parts or materials.







Flying Sparks/Metal Can Cause Injury

- Sparks and hot metal blow out from the plasma cutting arc; chipping and grinding cause flying material.
- Always wear safety glasses or goggles, along with a face shield or helmet, when cutting and/ or welding.
- Wear proper body protection to protect your skin.
- Wear flame-resistant ear plugs or ear muffs to prevent sparks from entering your ears.



• Failed parts on inverter power sources can explode or cause other parts to explode when connected to power. Always use a face shield or helmet and wear long sleeves when servicing power sources.



- Plasma cutting emits intense visible and invisible (ultraviolet and infrared) rays that can burn the eyes and skin.
- Use protective screens or barriers to protect others from the cutting arc; warn others not to watch as you cut.

- Wear protective clothing made from durable, flame-resistant material (leather or wool) and foot protection.
- Wear a helmet or face shield with the correct filter shade to protect your face and eyes when cutting or watching someone else cut. ANSI Z49.1 (see Safety Standards) suggests a #9 shade (with a #8 minimum) for all cutting currents less than 300 amperes. Z49.1 adds that lighter filter shades may be used when the arc is hidden by the work piece. As this is normally the case with low cutting currents, the shades suggested in Table 1 are provided for the operator's convenience.

Table 1		
Cutting Current in Amps	Min. Shade Level	
Below 20	#4	
20-40	#5	
40-60	#6	
60-80	#7	



Plasma cutting produces fumes and gases; breathing these fumes and gases can be hazardous to your health.

- Keep your head out of fumes; do not breathe the fumes.
- If cutting inside, ventilate the area and/or use an exhaust system at the arc to remove cutting fumes and gases.
- Do not work in confined spaces. When cutting in poorly ventilated areas, use an approved respirator.
- Read the Material Safety Data Sheet (MSDS) and the manufacturer's instructions for metals to be cut, as well as for coating and cleaners used.
- Do not cut in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors and form highly toxic and/or irritating gases.

- Do not cut coated metals, such as galvanized, lead, or cadmium plated steel, unless you remove the coating from the work piece, the area is well ventilated, or you are wearing an approved respirator. The coating and any metals containing these elements can give off toxic fumes when cut.
- Do not cut containers holding toxic or reactive materials or containers that previously held toxic or reactive material; the containers must be emptied and properly cleaned first.

On Overuse & Overheating

- Always follow the rated duty cycle of equipment and allow sufficient cooling periods.
- Ensure adequate airflow to all equipment to avoid overheating.

Gas Cylinders Can Explode

Gas cylinders can explode if damaged due to high pressure. Use caution when engaging in metalworking processes near gas cylinders.

- Protect gas cylinders from excessive heat, mechanical shocks, slag, open flame, sparks, and welding/cutting arcs.
- Install cylinders in an upright position, and secure cylinders to prevent falling or tipping.
- Keep cylinders away from cutting or other electrical circuits.
- Never allow contact between plasma torches and gas cylinders.
- Do not cut on gas cylinders.
- Keep cylinder cap over valve except when in use or connected for use.



• If you wear a pacemaker, consult your doctor before going near plasma cutting operations.

Inspection

After receiving your MicroCut 875SC v2 and removing from package, please inspect unit for concealed damage. All claims for loss or damage must be filed by the purchaser with the freight carrier.

Please ensure the air supply inlet at the back of the unit is free of packaging materials. Packaging materials within the air supply inlet will obstruct air flow to the torch.

Plasma/Cooling Gas Connection

The MicroCut 875SC v2 uses compressed air as both the plasma gas and the cooling gas. Water and oil in the air reduces the lifespan of your plasma torch and reduces the quality of your cuts. Damage incurred due to water and oil entering your plasma cutting system from the air supply line is not covered under warranty. While the MicroCut 875SC v2 comes with an air filter/ regulator, we suggest adding a desiccant dryer to your compressor.

HTP offers three desiccant dryer/filter systemsthe HTP Super Dry (Fig. 1, Part# 25300), the HTP Max Dry (Fig. 2, Part# 25310-2), and the HTP Max Dry XXL (Part# 25310-1G). The HTP Super Dry is a disposable air dryer that uses a desiccant to remove moisture from the air. When the desiccant turns from blue to white, replace the air dryer. The HTP Max Dry and Max Dry XXL feature a five stage filtration process and include reusable desiccant. When the desiccant turns from blue to a clear pink color, simply pour the desiccant on a baking sheet, place in the oven, and bake for about an hour or until the desiccant turns blue once again.







Fig. 2

Electrical Connection

The MicroCut 875SC v2 operates off of a 230 volt (+/-15 volt), single phase input power supply, wired for a minimum of 40 amps. Only qualified electricians should perform electrical connections and all electrical connections must be made in accordance with the National Electrical Code and local codes and ordinances.

When fitting your MicroCut 875SC v2 with a power plug, the ground (yellow-green or green) wire must be connected to the ground, otherwise serious injury or death may result. Never connect the ground (yellow-green or green) wire to an input (hot) terminal, and never connect the input wires (blue or brown when the machine is delivered without a plug; black or white if the machine came with a plug that needed to be cut off to change to a different style plug) to the ground terminal. We recommend installing a fusible line disconnect switch in the input power circuit of the MicroCut 875SC v2, which allows you to safely and easily remove all input electrical power prior to inspecting or servicing your plasma cutter.

Before making a connection between the MicroCut 875SC v2 and the input power supply, always ensure that the main power switch (Fig. 3, #8) is in the "Off" position or open the line disconnect switch.

Front Panel Connections & Controls



- 1) Plasma Torch Receptacle: Connection for the plasma cutting torch. If installed incorrectly, the cutter will not operate.
- 2) Cutting Current Adjustment: Controls the cutting amperage of the MicroCut 875SC v2. Infinitely variable from 30 to 55 amps.
- 3) Safety Alarm LED: LED illuminates red when you power on the MicroCut 875SC v2. Pressing the reset button (#7) turns the Safety Alarm LED off. If the Safety Alarm LED does not turn off after pressing the reset button, either the plasma torch is installed incorrectly, the consumables are not installed correctly, or the air pressure is set too low.
- 4) Thermo Switch LED: LED illuminates yellow if you exceed the duty cycle (40% at 55 amps) of the MicroCut 875SC v2. If you exceed the duty cycle of the cutter, leave the machine on, allowing the cooling fan to run. When the cutter cools, the Thermo Switch LED will turn off.
- 5) Air Pressure LED: LED illuminates green when properly connected to an air supply. The pressure gauge on the regulator should read above 70 psi; if the air pressure falls below 70 psi, the Air Pressure LED will shut off and the Safety Alarm LED will turn on, illuminating red.

- 6) Input Power LED: LED illuminates green when the MicroCut 875SC v2 is properly connected to a 220 volt input power supply and the Power Switch (#8) is turned on.
- 7) Reset Button: When you turn on the MicroCut 875SC v2, the Safety Alarm LED (#3) illuminates red. If the MicroCut 875SC v2 is properly connected to a power supply, the air supply is sufficient, and the torch is installed correctly, pressing the Reset Button will turn off the Safety Alarm LED and you can begin cutting.
- 8) Power Switch: Turning the Power Switch on will supply 230 volts of power to your MicroCut 875SC v2. When you finish working with the plasma cutter, turn the Power Switch off.
- 9) Gas Purge Button: Allows you to purge air through the cutting torch, manually cool the cutting torch after long periods of cutting, and set the air pressure as air flows through the torch. To purge the torch, press the gas purge button; air will flow and then stop flowing automatically.
- 10)CNC/Manual Cutting Switch: Allows you to select either the CNC cutting mode or the Manual cutting mode. When cutting in CNC mode, the cutter will be limited to 45 amps max output, which assures 100% duty-cycle operation. When cutting in manual mode, the arc ignites automatically after losing contact with the work piece. Automatic cutting is ideal when cutting all different types of material including expanded metal.
- 11) Ground Cable Receptacle: Connection for the ground cable and clamp assembly. To install, align the tab on the ground plug with the notch in the receptacle, insert the plug, and twist to lock into place. Connect the ground clamp to a clean spot on the work piece, as close to the cutting arc as possible.

Setup

Plasma Torch Connection

Before installing the plasma cutting torch, disconnect power to the machine. The MicroCut 875SC v2 features a quick disconnect style cutting torch, which means you can easily remove and install the torch without any tools.

To install the cutting torch, insert the copper plug on the torch into the center of the adapter block on the front of the MicroCut 875SC v2 (See Fig. 3, #1). Rotate the plasma torch until the plastic tab on the plasma torch fits into the cutout at the top of the adapter block. Firmly push the plasma torch into the adapter block and tighten the adapter nut to secure the torch in place.

Ground Cable Connection

Connect the ground cable to the front of the MicroCut 875SC v2 (See Fig. 3, #11). To install, align the tab on the ground plug with the notch in the receptacle, insert the plug, and twist clockwise to lock into place.

Connect the ground clamp to clean and clear metal as close to the work piece as possible in order to reduce current loss through stray paths. Do not, however, connect the ground clamp to metal that you will cut off.

Operation

Please read and understand the operating instructions prior to working with your MicroCut 875SC v2.

- 1) Wear the correct eye protection and clothing, and follow all safety suggestions.
- 2) Connect the MicroCut 875SC v2 to a clean, dry source of compressed air. <u>FAILURE TO DO SO</u> <u>WILL RESULT IN SEVERELY SHORTENED</u> <u>CONSUMABLE LIFE, AS WELL AS SEVERELY</u> <u>RESTRICTED POTENTIAL AND</u> <u>PERFORMANCE. THE TRAVEL SPEED AND</u> <u>MAXIMUM CUTTING CAPACITY WILL BE</u> <u>SEVERLEY LIMITED.</u>
- 3) Set the regulator on the back of the machine to 70 psi with the air flowing. This can be done by pressing the purge button on the front of the machine.
- 4) Connect the MicroCut 875SC v2 to a 230 volt power supply (See Electrical Connection on Pg. 7). Turn the Power Switch (Fig. 3, #8) on. The Input Power LED (Fig. 3, #6) will illuminate green, the Air Pressure LED (Fig. 3, #5) will illuminate green, and the Safety Alarm LED (Fig. 3, #3) will illuminate red. Press the Reset Button (Fig. 3, #7). As long as vou properly connected the MicroCut 875SC v2 to a power supply, connected a sufficient air supply, and installed the torch and torch consumables correctly, the Reset Button will turn off the Safety Alarm LED and allow you to start cutting. Note: When the input voltage is too low, the cutter will turn on, the solenoid will open, and air will flow when you depress the trigger. However, the pilot arc will not ignite.
- 5) Connect the ground clamp to the work piece as close to the cutting arc as possible.
- 6) Using the Cutting Current Adjustment knob (Fig. 3, #2) select the output current or output amperage desired. You should base this setting off the type and thickness of the material you plan to cut.

7) When ready to cut, place the cutting torch on the edge of the material and depress the trigger on the torch handle. The plasma arc will start immediately. With the plasma arc perpendicular to the work piece, begin to move the plasma torch in the desired direction and at a speed in which the plasma arc bends anywhere from 5 to 15 degrees. The sparks should shoot out beneath the work piece. If the sparks shoot up from the work piece, slow down and/or adjust the output current. When you finish cutting, release the trigger to extinguish the plasma arc. Please note that air will continue to flow from the torch for an additional 15 seconds to cool the plasma torch.

Manual Piercing

When cutting thicker materials, hold the plasma torch at an angle and slightly off the work piece. If you hold the torch perpendicular to the work piece, slag, with no place to go, will flow up and damage the plasma torch consumables. Depress the torch trigger to start the plasma arc, and slowly roll the torch perpendicular to the work piece. Once you pierce through the material completely, begin moving the torch in the desired direction as normal.

Cutting in Manual Mode

Put the CNC/Manual Cutting Switch (Fig. 3, #10) into the Manual (bottom) position. Make your cut as normal. When you reach the end of the work piece, the arc will extinguish. However, if you keep your finger on the trigger (trigger depressed), the arc will restart when the torch once again meets metal.

Material Thickness	Cut Speed (IPM)	Pierce Height (Inches)	Pierce Delay (Sec)
20ga	380	.160	.2
16ga	350	.160	.2
14ga	280	.160	.2
12ga	190	.160	.3
10ga	140	.160	.4
3/16"	85	.160	.5
1/4"	52	.160	.6
3/8"	26	.180	.9
1/2"	16	.180	1

Fig. 4: Shows some guidelines for cutting steel. For aluminum, increase the travel speed slightly (about +5%), and for stainless steel, decrease the travel speed slightly (about –5%).

CNC Piercing

You can also pierce materials up to 1/2" thick when connected to a CNC plasma cutting table. Cutting height is typically about .120" and pierce height is .130"-.180" depending on material thickness.

Cutting in CNC Mode

Put the CNC/Manual Cutting Switch (Fig. 3, #10) into the CNC (top) position. Program your machine with the correct pierce and cut heights as shown in Fig. 4, and match your pierce and travel speed to your material thickness.

Maintenance & Service

Power Source

Warning! Turn off plasma cutter and disconnect from input power supply prior to servicing.

Remove cover and inspect the inside of power source once a month. Use an air compressor to remove any dust and debris. You can also remove dust and debris without removing the cover by blowing into the louvers located on the front and/or back of the power source. Removing dust and debris from inside the power source ensures the unimpeded operation of your plasma cutting equipment. Also, check the power cable and power cable connection regularly.

Plasma Torch

Warning! Turn off plasma cutter and disconnect from input power supply prior to servicing.

Warning! Plasma torch parts reach high temperatures when cutting. To avoid the risk of burns, please wait for the plasma torch to cool completely prior to servicing or replacing consumables.

- 1) Cleaning the torch consumables regularly helps maintain the life of the parts.
- 2) Check the nozzles and electrodes for proper installation prior to each use.
- Check the air supply quality prior to each use, and make sure the air is set to at least 70 psi when cutting.
- 4) As consumable parts, the nozzle and electrode wear out due to use. Check the nozzle and electrode regularly and replace when necessary. For instance, when the hole in the cutting tip measures about 1/16" in diameter, replace the cutting tip; when the electrode develops a center pit measuring approximately 1/16" deep, replace the electrode. Keeping an eye on the life status of cutting tips and electrodes, and replacing these parts when necessary, ensures continual cutting efficiency. Check all other torch consumables for damage and replace if necessary.
- 5) Check the torch handle for cracks and replace if necessary.

If you notice any damage to the machine or torch cable assembly, contact HTP America, Inc. directly at 847-357-0700.

ALL OTHER SERVICE SHOULD BE PERFORMED BY AUTHORIZED PERSONNEL ONLY.

MicroCut 875SC v2 Hand Torch Parts & Consumables



Part#	Description
A) 87005HSMO	Shield Cap
B) 87005HMO	Shield Cup Body
С) 87030МО	Contact Cutting Tip, 20-50A
D) 87003M0	Electrode
E) 87058MO	Swirl Ring
F) 87002HTH	Torch Head
87030GSM0 (Not Pictured)	Gouging Tip, 45A
87005GMO (Not Pictured)	Gouging Shield
87002HT (Not Pictured)	20' Complete Hand Torch



MicroCut 875SC Tecmo TM-70 Machine Torch Parts & Consumables



Part#	Description
A) 87005SMMO	Shield Cap
B) 87005HMO	Shield Cup Body
С) 87030МО	Contact Cutting Tip, 20-50A
D) 87003M0	Electrode
E) 87058MO	Swirl Ring
F) 87002MTH	TM-70 Torch Head
87002MT (Not Pictured)	20' Tecmo TM-70 Complete Machine Torch

MicroCut 875SC v2 Parts Breakdown



#	Description	Part Number	#	Description	Part Number
1	Front Panel Label	66146	22	Fuse Holder	64180
2	Amp Adjustment Knob	66106	23	Label (Side Panels)	66116 (Not Pictured)
3	On/Off Knob	—	24	Cover (Top & Right Side)	62059
5	Plasma Torch Receptacle	61471	25	Input Power Cable	64761
6	CNC/Manual Switch	64188	26	Handle	66103
7	Ground Receptacle	64280	27	Regulator/Air Filter	63055
8	Front Panel	60104	28	Fuse	64250
9	Front Panel Holder	62059	31	Fuse PCB	61820
10	On/Off Switch	64724	32	Regulator/Air Filter Cover	62046
13	Pilot Arc PCB	610833	34	Aux Transformer	65019
14	XL	61307	36	Pressure Switch	64032
15	Bottom Panel	62046	37	Solenoid Valve	64393
16	Foot	66501	38	Primary PCB	61088
17	Secondary PCB	61078	39	Switch	64132
18	Thermostat	65023	40	Pilot Arc PCB Cover	66107
19	Fan	64182	46	Logic PCB	61401
20	Label (Rear)	62047	47	Line Filter PCB Support	61285
21	Fan Grid	66104	50	Side Panel (Left)	62045

Wiring Diagram



MicroCut[™] 875SC v2 CNC Wiring

Connection	Description	Notes
Pins 3 & 4	Trigger Circuit	The CNC table sends a continuity signal to pins 3 and 4 to get the plasma cutter to fire.
Pins 12 & 14	Arc OK Circuit	The plasma cutter sends a continuity signal to the CNC table once the arc is established.
Pins 5 & 6	Arc Voltage 50:1	Pin #5 is Negative and pin #6 is positive.
Pin 13	Chassis Ground	

The mating 14-pin connector is **HTP P/N 64672**, which allows you to make a CNC interface cable, connecting your CNC table to your HTP MicroCut 875SC v2. If your machine does not have the CNC interface installed, and you would like to connect your machine to a table, a CNC interface kit (**HTP P/N CNC-KIT**) is available for field installations.

