

HT4001[®]

Pulse Start Upgrade

Field Installation Bulletin
802200 - Rev. 1

Hypertherm
The world leader in
plasma cutting technology

HT4001[®]

Pulse Start Upgrade

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HT4001 Pulse Start Upgrade

INTRODUCTION

General

This modification to the HT4001 system requires changes to the power supply, the firmware and the remote high frequency console. Some older systems may also require the replacement of their 029650 torch hose subassembly with the 129158 version.

Customer Required Tools

Phillips head screwdriver
7/16" wrench

HT4001 Pulse Start and 340 Amp Upgrade Kit: 028850

Part No.	Description	Qty.
028850	HT4001 Pulse Start & 340 Amp Upgrade	
029885	HF Pnl SA:HT400X RHF Csl II	1
129158	Hose Assy III:PAC170 Torch Gas	1
041282	PCB Assy:4001 4-Chan Anlg	1
028820	Parts Kit, 340 Amp Upgrade	1
020086	Nozzle:PAC170 .099 OXY	10
120135	Swirl Ring:PAC170 340A OXY	2
120630	Electrode:PAC170 340A OXY	10
081019	Firmware:HT4001 Power Supply	1
027338	Tool: All Purpose Chip Extracting	1
008197	Tool: Amphenol Pin/Socket Extracting	1
802200	HT4001 Pulse Start Upgrade FSB	1
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HT4001 Pulse Start Upgrade



WARNING - HIGH VOLTAGE!



Power to the HT4001 system must be disconnected before
modification!

HT4001 Pulse Start Upgrade

MODIFICATION TO HT4001 POWER SUPPLY

Description

Two changes must be made to the HT4001 power supply to change the current system into a pulse-start 340A oxygen cutting system:

- The analog board (PCB3) must be disconnected and replaced with the analog board that comes with this kit (041282 Rev 2 or later).
- Firmware on the control board (PCB2) must be updated to Rev F or later (Rev K or later if you are also replacing the cable/hose assembly).

Analog Board Replacement Instructions

1. Remove analog board PCB3 connectors PL3.9, PL3.5, PL3.6, PL3.7, PL3.10, PL3.4, and PL3.3 from their respective receptacles. Fig. 1.
2. Remove the screws that secure the analog board to the power supply and remove the board.
3. Secure analog board 041282 Rev 2 or later to the power supply using the same hardware removed in step 2.
4. Attach analog board connectors PL3.9, PL3.5, PL3.6, PL3.7, PL3.10, PL3.4, and PL3.3 to the proper receptacles. Refer to Fig. 1.

Firmware Replacement Instructions

1. Find and remove U9 from the control board PCB2 using the chip extracting tool supplied. Follow instructions included with tool. Fig. 1.
2. Replace with 081019 Rev F or later (Rev K or later if you are also replacing the cable/hose assembly) firmware, taking care to align pin 1 with the lower left corner of the socket.

HT4001 Pulse Start Upgrade

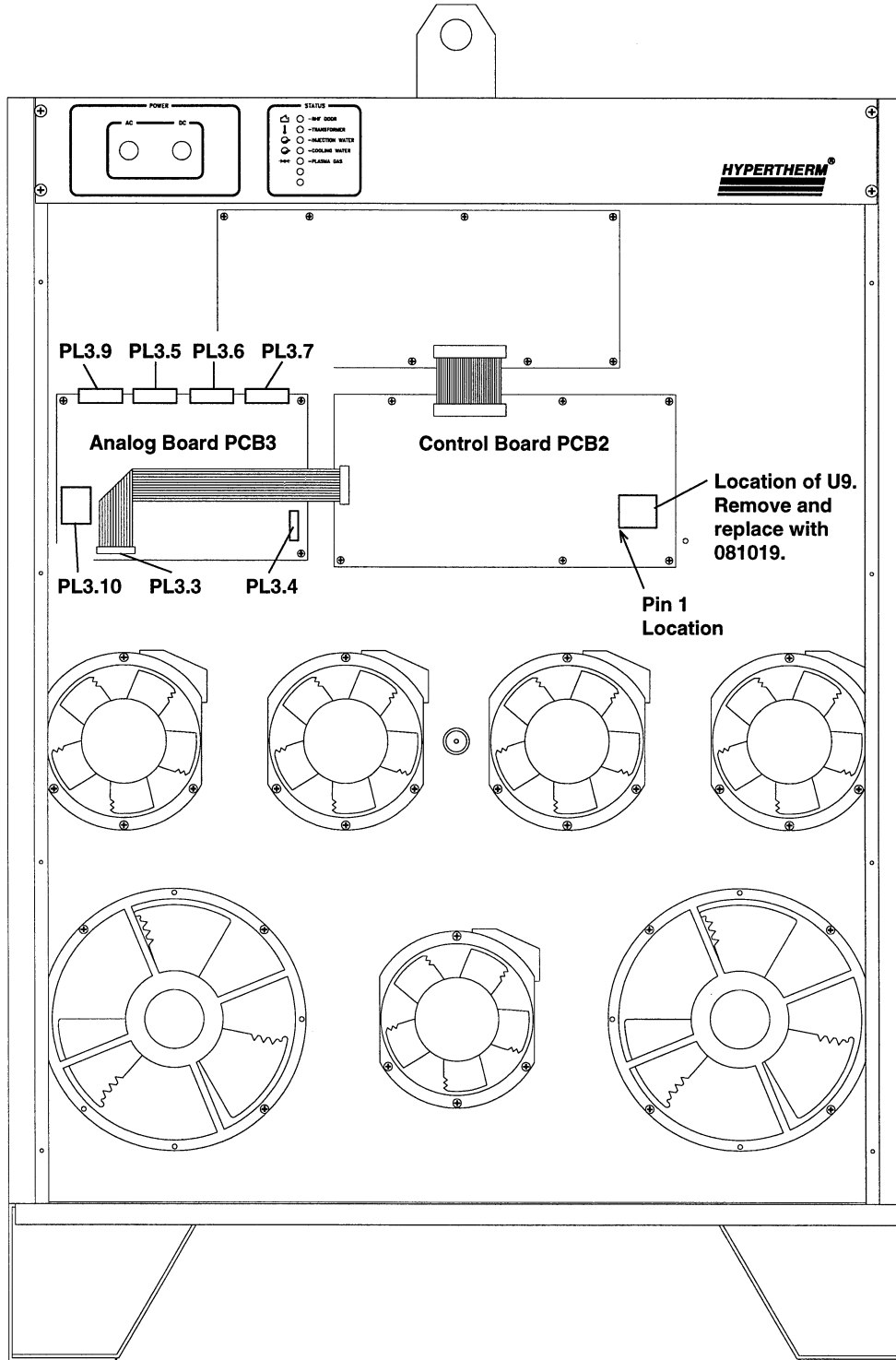


Figure 1 - HT4001 Power Supply - Modification locations

HT4001 Pulse Start Upgrade

MODIFICATION TO HIGH FREQUENCY CONSOLE

Description

The 029934 high frequency panel in the RHF console must be replaced with the new 029885 high frequency panel. Seven wires need to be detached from components on the old high frequency panel before the four nuts that secure the panel to the chassis can be removed.

High Frequency Panel Removal Instructions- Refer to Fig. 2

1. Locate the two AC wires coming from the 2X1 connector and going to the input of the line filter. Disconnect at the line filter and leave wires attached to the 2X1 connector.
2. Detach the pilot arc lead from the torch at the high frequency coil inductor.
3. Detach the pilot arc lead from the power supply at terminal block TB1-1.
4. Detach the wire coming from the cathode block and going to the two .5 μ F capacitors.
5. Detach the two ground wires from the console chassis.
6. Using the supplied amphenol pin extractor, remove wires 9 and 11 from the 2X1 connector.
7. Unscrew the four 1/4-20 nuts and remove the 029934 high frequency panel.

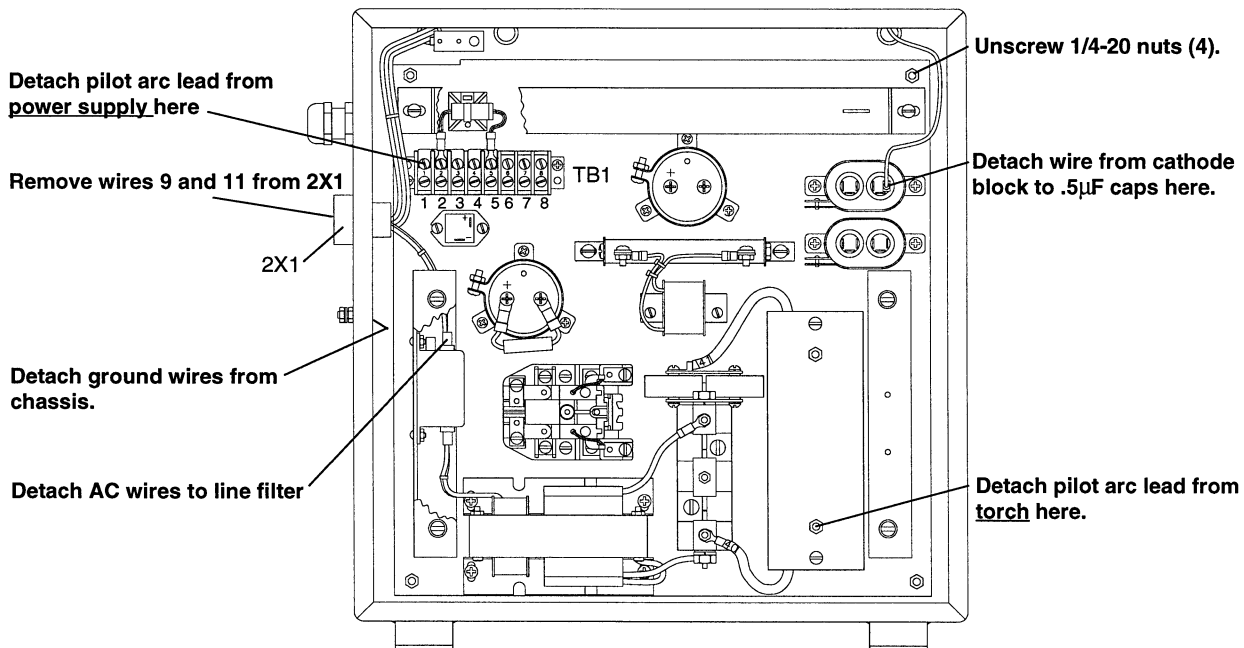


Figure 2 High Frequency Panel - 029934 (old style)

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High Frequency Panel Replacement Instructions- Refer to Fig. 3

1. Orient 029885 high frequency panel as shown in figure 3 and screw the four 1/4-20 nuts to secure the panel in place.
2. Attach wire from cathode block to the two .5 μ F caps as shown.
3. Attach the pilot arc lead from the torch to the high frequency coil inductor.
4. Attach the pilot arc lead from the power supply to the terminal strip TB1 at position 1.
5. Attach the AC wires from the 2X1 connector to the line input end of the AC filter:
 - Attach the wire labeled 61 to the rear terminal.
 - Attach the wire labeled 60 to the front terminal.
6. Attach the ground wires from the filter and the high-voltage transformer labeled PE to the RHF chassis.
7. Take loose wire labeled 3 from TB1 and plug pinned end to position 3 in 2X1 connector. Take loose wire labeled 6 from TB1 and plug pinned end to position 6 in 2X1 connector. Take loose wire labeled 9 from TB1 and plug pinned end to position 9 in 2X1 connector. Take loose wire labeled 11 from TB1 and plug pinned end to position 11 in 2X1 connector.

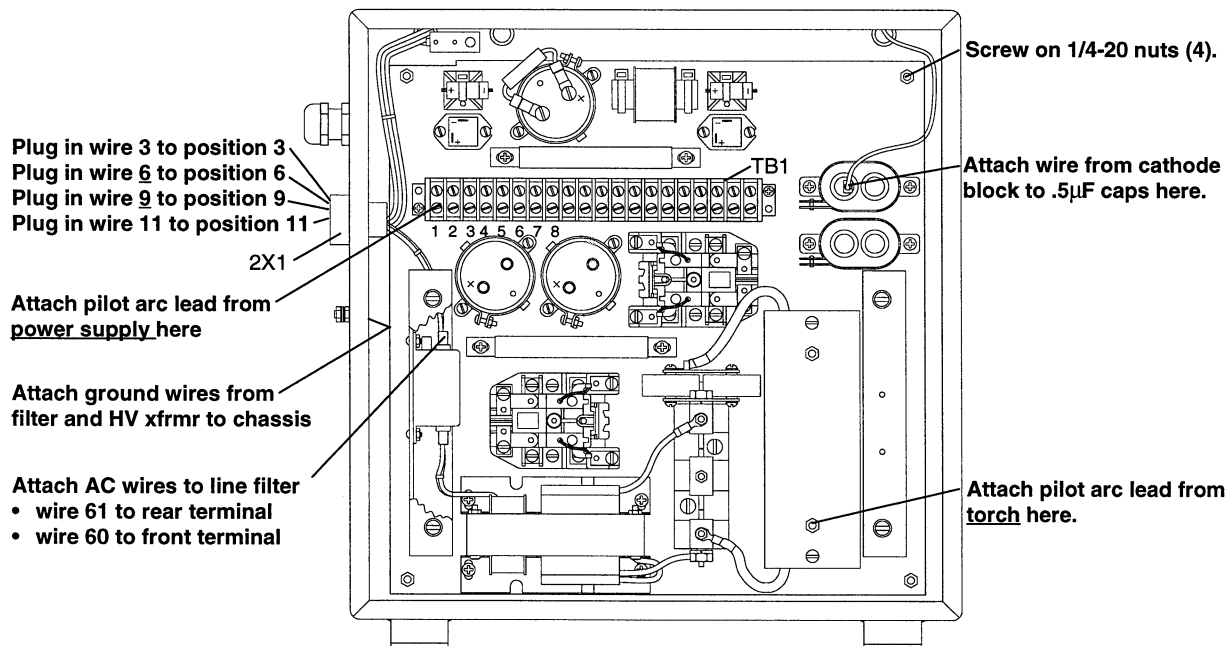


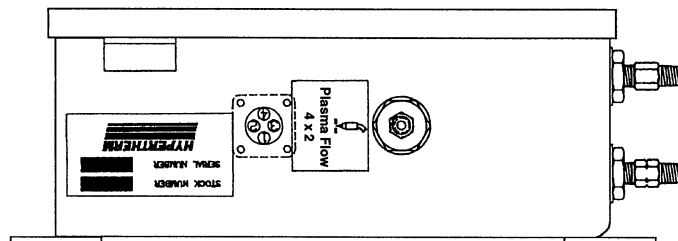
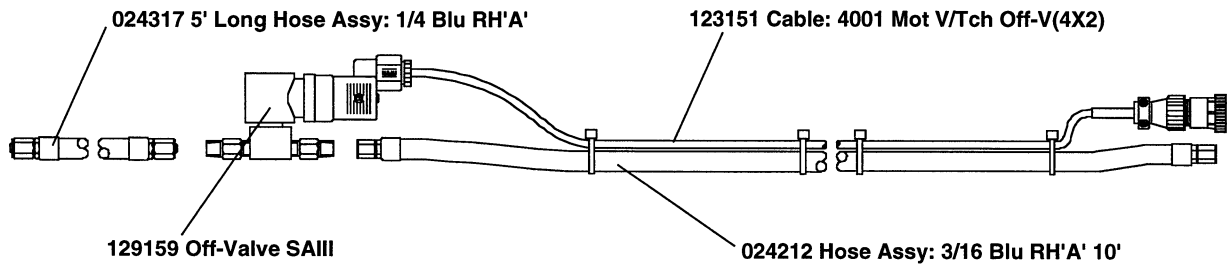
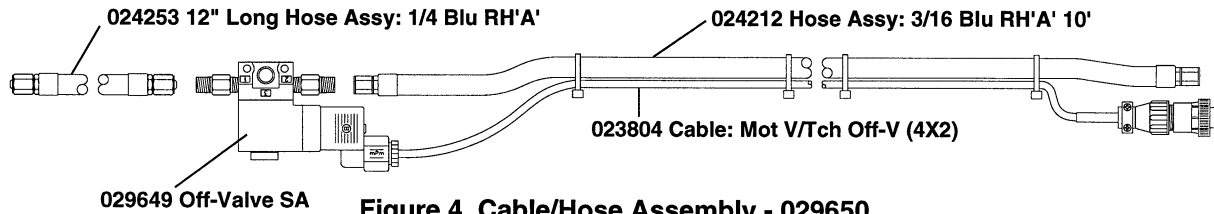
Figure 3 High Frequency Panel - 029885 (new style)

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REPLACEMENT OF CABLE/HOSE ASSEMBLY

Description

If the cable/hose assembly between the motor valve console and the torch is 029650, replace with the 129158 cable/hose assembly. See Figs. 4 and 5 below.



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Cable/Hose Assembly Replacement Instructions

1. Remove plasma gas hose 024253 from the off-valve assembly that goes to the torch - See Fig. 4.
2. Unscrew insulating sleeve and slide up over torch leads and out of the way.
3. Remove plasma gas hose 024253 from the torch. - See Fig. 7.
4. Remove cable/hose assembly (029650) from the motor valve console - See Figs. 4 and 6.
5. Connect the 4X2 connector and the plasma gas hose from the new 129158 cable/hose assembly to the motor valve console. See Figs. 5 and 6.
6. Slide the 5' long plasma gas hose from the off-valve through the insulating sleeve and attach to the torch. See Figs. 5 and 7.
7. Slide insulating sleeve back over the torch leads and screw sleeve to torch.

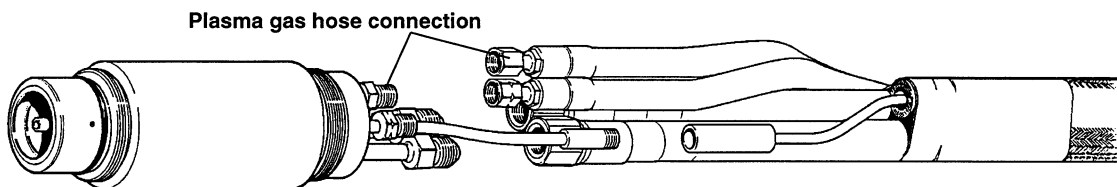
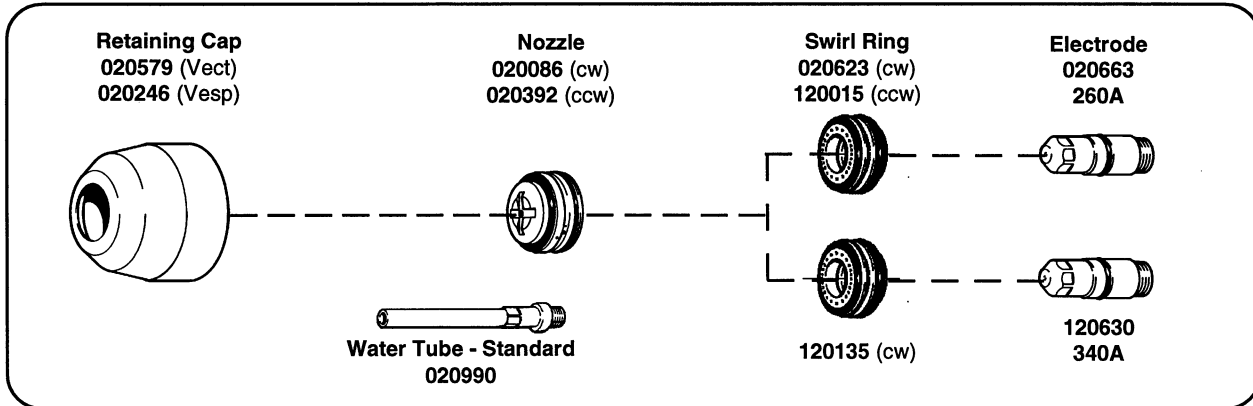


Figure 7 Plasma Gas Hose Connection to PAC620 Torch

After completing the pulse start upgrade, refer to the HT4001 instruction manual (802000) for all other information concerning the HT4001 system. The 260 and 340 amp cut charts appear on the following page for quick reference.

HT4001 without Slave
PAC620 Torch - Standard Consumables
Mild Steel - Oxygen Plasma



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Electrode	Material Thickness		Test Preflow Rate		Test Cut Flow Rate	Water Flow Setting (%)	Arc Volts (V)	Arc Current (A)	Torch Standoff		Travel Speed	
	(in)	(mm)	(N ₂) (%)	(O ₂) (%)	(O ₂) (%)				(in)	(mm)	(ipm)	(mm/min)
260A	1/4	6.35	16	11	80	60	120	260	1/8	3	170	4320
	1/2	12.7	16	11	80	60	130	260	3/16	5	100	2540
	3/4	19.1	16	11	80	60	135	260	3/16	5	70	1780
	1	25.4	16	11	80	60	140	260	3/16	5	50	1270
340A	1/2	12.7	16	11	80	60	130	340	1/8	3	110	2800
	3/4	19.1	16	11	80	60	140	340	3/16	5	85	2160
	7/8	22.2	16	11	80	60	145	340	3/16	5	75	1900
	1	25.4	16	11	80	60	145	340	3/16	5	65	1650
	1-1/4	31.8	16	11	80	60	145	340	3/16	5	45	1140

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Electrode	Material Thickness		Test Preflow Rate		Test Cut Flow Rate	Water Flow Setting (%)	Arc Volts (V)	Arc Current (A)	Torch Standoff (mm)	Travel Speed (mm/min)
	(mm)	(mm)	(N ₂) (%)	(O ₂) (%)	(O ₂) (%)					
260A	8	16	11	80	60	125	260	3-4	3850	
	10	16	11	80	60	130	260	4	3300	
	12	16	11	80	60	130	260	4-5	2730	
	15	16	11	80	60	135	260	5	2260	
	20	16	11	80	60	135	260	5	1700	
340A	25	16	11	80	60	140	260	5	1300	
	15	16	11	80	60	135	340	5	2570	
	20	16	11	80	60	140	340	5	2080	
	25	16	11	80	60	145	340	5	1680	
	30	16	11	80	60	145	340	5	1280	

Notes: Minimum O₂ inlet pressures remain at one setting of 120 psi (8.2 bar) for all material thickness.
Minimum N₂ inlet pressures remain at one setting of 150 psi (10.3 bar) for all material thickness.
O₂ flow rate at full scale is 127 scfh (60 l/min) @ 120 psi (8.2 bar) inlet pressure.
N₂ flow rate at full scale is 374 scfh (176 l/min) @ 150 psi (10.3 bar) inlet pressure.
Water chiller pump outlet pressure remains between 175-185 psi (12-12.8 bar) for all material thickness.
Set initial torch height (before piercing) to approximately twice the Torch Standoff distance for the material you are cutting.