

## Hooking Up Your Plasma Machine to the MP1000-THC

CAUTION: Portions of this install may include opening your plasma cutter machine and attaching wires. **MAKE SURE THE UNIT IS UNPLUGGED PRIOR TO REMOVING ANY COVER(S) OR MAKING ANY CONNECTIONS.** Plasma units have **HIGH VOLTAGES** present that can be dangerous or lethal. **IF YOU ARE NOT EXPERIENCED WORKING WITH HIGH VOLTAGES, DO NOT ATTEMPT TO INSTALL THIS OR ANY OTHER DEVICE INSIDE YOUR PLASMA UNIT YOURSELF. SEEK PROFESSIONAL HELP.**

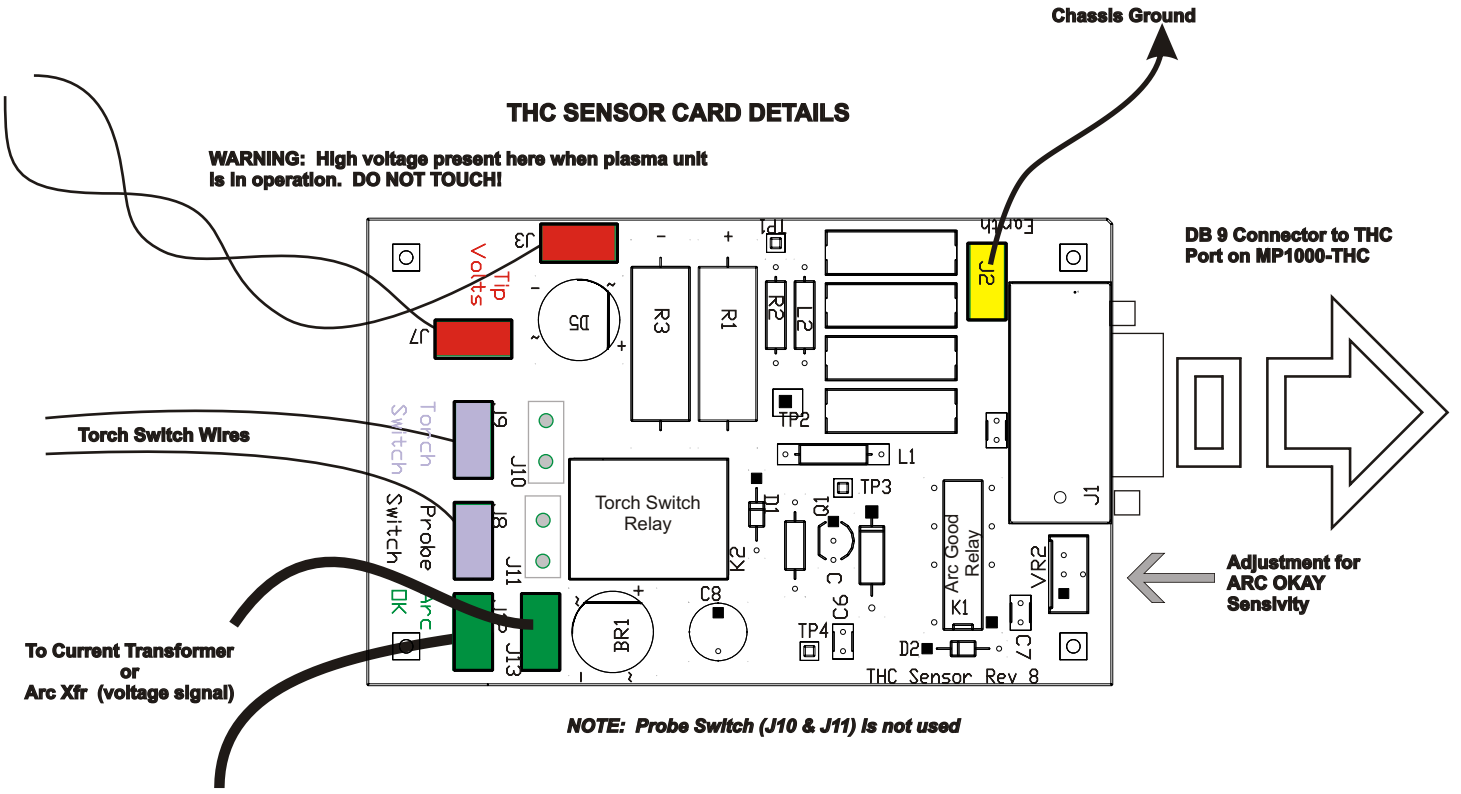
In order to control your plasma unit, there are three main connections that need to be made to the plasma unit itself. All of the following operations are to be done with the power ***disconnected*** from your plasma unit. You should decide if you want to mount the THC Sensor PCB inside your plasma unit or in a small external box on the outside of the unit. You will need access to the DB9 connector on the THC Sensor card so if you mount the card inside, it should be so that the DB9 is exposed. If you cut a small square in the cover or front panel so that the connector frame will pass through and drill two holes for the connector mounting holes you can use the connector mounting jack screws to hold the board in place. If you use an external box you will need to provide holes for the signals listed in the following steps. Also there is a trigger level adjustment pot on the front of the card (VR1) to adjust the level of current that trips the ARC GOOD signal. Drill an access hole to be able to adjust that pot. External connectors, hookup wire and external enclosure are not provided.

### THC SENSOR PCB INSTALL:

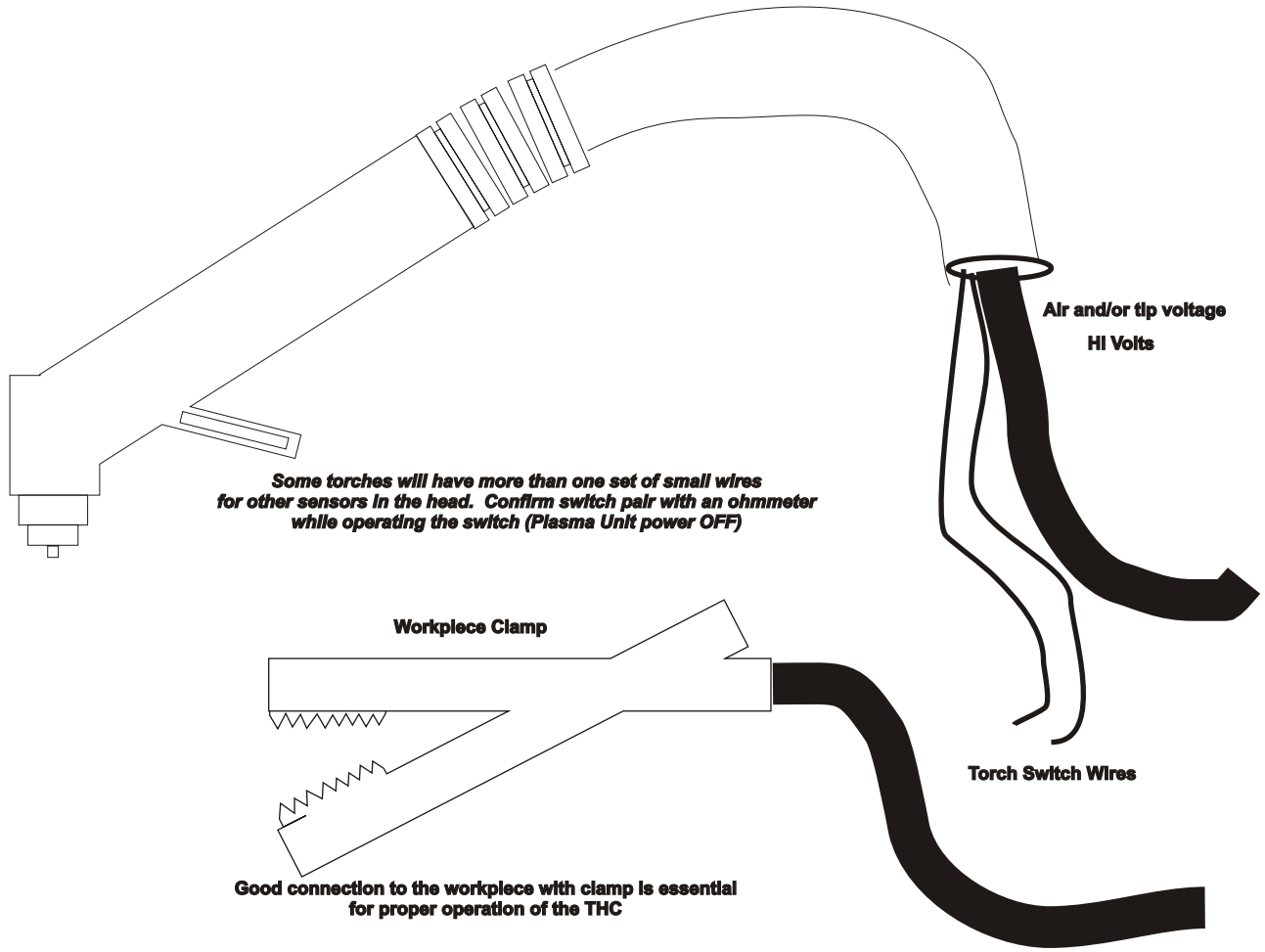
**If your plasma unit does not have an external activate (remote) torch switch**, you must find the torch activate switch connections. Normally the torch handle will have at least one set of small wires coming from the torch head cable and attaching to a screw terminal post inside the box. Find the point where the torch cable enters the box and identify any small pair(s) of wires that travel up the torch head cable. Most machines are setup to be able to change out the entire torch head and cable assembly and will have screw terminals (or a plug) inside to make that operation easier. Some machines have different types of special connectors to make changing the torch out easier so you may have to trace back where the wires make attachment to a terminal strip or an internal card. *If you modify any wiring or circuitry be aware it may void your warranty on the plasma machine.*

### THC SENSOR CARD DETAILS

**WARNING: High voltage present here when plasma unit is in operation. DO NOT TOUCH!**



**NOTE: Probe Switch (J10 & J11) is not used**



1. The terminals provide a convenient place to do your connections. Use crimp-on spade or round terminals to attach the wires to the terminal strips. Make sure the new wires you install do not touch adjacent metal objects. On some machines there may be more than one set of small wires and are used for sensing tip shorts and other conditions. To identify the correct pair use an ohmmeter or continuity checker across each pair while you manually push the torch head button. When you identify the pair make note of where they attach. Use #22 to #18 stranded wire (twisted pair) to connect between the two screw terminals on the THC Sensor PCB marked "Torch Switch" (J5) to the two switch terminals in the plasma unit. There is no polarity. **NOTE:** IF your unit has noise filter chokes from the torch switch wires up to its internal logic card, it is recommended you place the two wires to the THC Sensor PCB on the other side of the chokes from their torch head connection (end closest to the internal logic card).
  
2. **If your unit has a tip voltage connection point** (i.e. like the Hypertherm 1000 series) ,you will need to use their manual and suggestions as to how to connect to the two points and run those wires to the THC Sensor card. Just make sure you use wire that has insulation rated for at least 400 V. Small signal wire like telephone wire (UTP) is **not** rated that high and can arc to nearby components. The THC Sensor card is designed to take the **full tip voltage** and divide and filter it. Open circuit full tip voltage can be as high as 300VDC in some machines.
  
3. **If your plasma unit does not have a designated tip voltage measurement point**, you will need to locate a place inside the unit where you can get one wire onto the workclamp lead and another on the heavy lead that connects to the torch tip.
  - a. Note: some machines like the Hypertherm 380 do not have a single heavy wire to the Torch tip and instead have a set of parallel smaller wires that all terminate into one connector. In the case of the 380 the WHITE wires are the tip volts.
  - b. You can identify both locations by visually tracing the two leads as they come into the box. You should find several locations/terminal strips that have connections to these two points and you can use those for your sense wire connections. Use unshielded stranded twisted wire of #22 to #18 ga rated for at least 400V insulation.
  - c. Make a connection between the locations you have identified that tie directly to the two leads (workclamp and torch tip) to the two "Torch Tip" terminals on J3. Make sure that these wire are routed

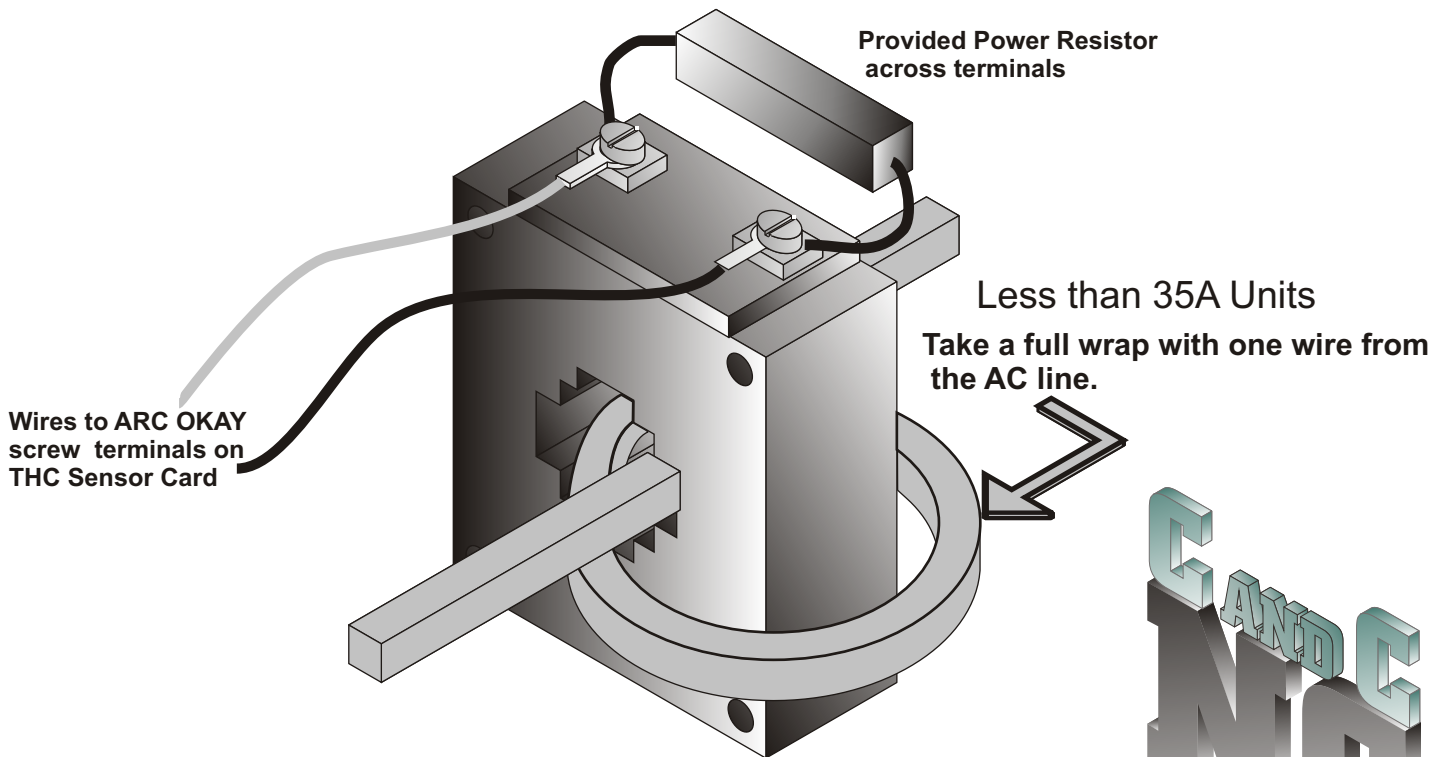
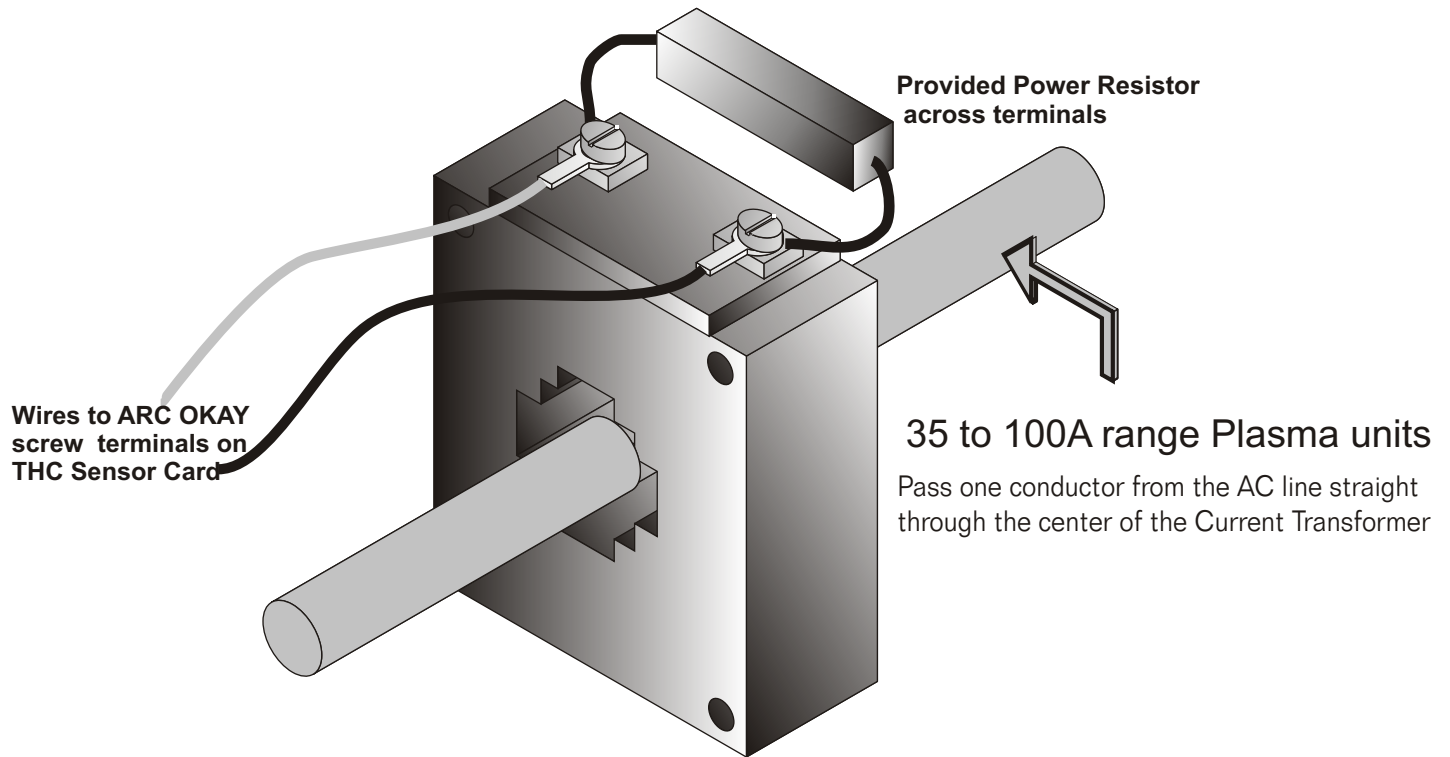
- a. where they cannot come into contact with hot or moving components.
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2. **If your plasma unit does not have an “arc good” signal jack do the following:** Make *SURE* the cord to the plasma unit is disconnected from any voltage source. If you have room inside the unit disconnect one of the AC hot leads prior or following the Main switch and slide the wire through the center of the current sense transformer like a finger through a donut. There are two connections on top of the transformer and the large power resistor supplied needs to be connected with one lead on each connection. In addition you need to connect a twisted pair wire between the two connections and the terminal on the board marked “ARC Good”(J6). No polarity. The transformer is a current transformer and forms its voltage across the power resistor. This is an AC voltage that we rectify and use to trip the Arc Good circuit /relay on the THC Sensor PCB and use the isolated relay contacts to signal the parallel port and MACH2/3. A good way to mount the current transformer inside the unit is to use a plastic cable tie and secure it to a nearby bundle of wires or bracket.
  3. **If you have a plasma unit that DOES have an Arc Good signal,** you do not need to install the Current Transformer and power resistor. Just make the connection to the Arc Good terminal. Some units provide only relay contacts; **that will not drive the Arc Good relay.** The Hypertherm has a provision on some machines that have Arc Good to make the signal a +24 output on a valid arc. Their manual covers the conversion (one jumper) See the addendum for possible circuit suggestions.

Note: The term Arc Good is interchangeable with Arc Okay and Arc Xfer

4. You will need to make a connection from the THC Sensor PCB THC terminal J4 marked “Earth Ground” to the chassis ground of the plasma torch unit. NOTE: IT is ESSENTIAL that the chassis of the plasma unit have a good earth ground. Refer to the suggested grounding section of the diagrams (#####) and provide for a good earth ground close to the table. A safety ground back to a breaker panel many feet away may be a good ground for AC frequencies (60hz) but poor for higher frequencies like plasma noise. Since we are bypassing any high frequency noise to the plasma chassis, if it has a poor noise ground it can actually put noise back into the tip volts rather than shunting it away!

# INSTALLATION OF CURRENT TRANSFORMER

*Used for plasma units that do not have  
Arc Good (Arc Xfer) signal*



CANDC  
NCC

# Grounding practices to reduce noise and increase safety

