Machine Grounding Procedures

Proper Grounding of the machine is essential. A plasma power supply is an electrically noisy piece of equipment. Proper grounding will ensure that the electrical noise and RF emitted by the plasma power supply does not interfere with the CNC electronics. Electrical noise can cause phantom eStop and limit triggers as well as stray pulses to the motor drives causing erratic movement.

1. The first step in proper grounding is to drive a ground rod as far into the ground as possible. The ground rod should be driven down to wet earth and should be as close to the machine as possible.
2. Establish a ground point on the table. This is called a star ground. Factory built tables have a ground lug on the rear of the table frame. See the grounding diagram for an idea of where the star ground should be.
3. Connect the DB25 control cable to the controller and to the PC.
4. Connect a wire from the controller ground stud on the bottom of the controller box to the table star ground.
5. Cut the plasma ground lead roughly in half and strip back the cut ends. Connect each stripped end to the star ground point. This creates a ground from the plasma power supply to the table from and also a lead from the table frame to the work. If you don’t want to cut the ground lead, you can unbolt the ground clamp, connect the factory lead to the table frame and make a new lead to go from the table frame to the work clamp.
6. Run a heavy solid copper wire from the star ground to the ground rod you installed in step 1. 6ga or 8ga is adequate.

DO NOT route, tie or bundle any wires to the DB25 control cable. It is tempting when setting up a machine to tie all wires and cables in a neat and orderly bundle. The DB25 control cable carries signals such as estop, limit and motor control pulses. If this cable is positioned in a manner that permits it to pick up electrical interference, odd behavior may occur.

Route the DB25 control cable by itself. If it needs to cross other cables, make them cross perpendicular. If you must run the DB25 control cable parallel to any other wires or cables, maintain at least 12” of separation between the two.

DO NOT route the plasma torch lead, power cord or automation interface cable near the controller box or the DB25 control cable. If the plasma torch lead, power cord or automation interface cable needs to be routed in the vicinity of the controller box, maintain at least 12” of separation between any other wires or cables.

DO NOT enclose the in an unvented enclosure. Any enclosure used must be well vented. During operation, you should not be able to feel a noticeable difference between the temperature inside the enclosure and room temperature. We recommend installing a fan if any type of enclosure is used.

DO NOT route the torch lead in close proximity to the control box, control cable or PC.
Make sure the DB25 control cable and automation interface cable are not in close proximity and/or parallel to each other. The automation interface cable carries tip voltage to the THC. This voltage can translate to interference in the DB25 control cable. See the diagram below for proper cable routing when signal cables must be routed in close proximity to power cables.