Step 3: Assembling and Connecting Your Laser System

STOP

Familiarize yourself with the instructions before getting started.

The final step in installation is to assemble your laser system, install the laser cartridge(s), level the laser system, make final connections and perform a beam alignment check. Do not power up your laser system until the final step, “Checking Beam Alignment.”

CAUTION: Do not attempt to move or lift this laser system alone. Obtain assistance from additional people when lifting or carrying the laser system and make sure to secure the motion system and doors before lifting. Injury may occur if improper lifting techniques are used or the system is dropped.

Machine Assembly

1. Unpack the laser system.
2. Remove the unassembled cart from the top of the laser system.
3. a. Back panel  
   b. Legs (both are identical)  
   c. Side panels (two)  
   d. Shelf panel  
   e. 1/4-20 x ½, socket head screws w/lock & flat washers (twelve)  
   f. Nuts (four)  
   g. Locking casters (four are identical)  
   h. 10-32 x 3/8 socket head screws w/lock & flat washers (two)  
   i. Connect to main enclosure

   slow, but leave all of the screws slightly loose, except for possible into each cart leg.

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4. With the assistance of another person, place the system on top of the cart and loosely install the provided screws that attach the machine to the cart. These screws go up through the cart legs into the bottom of the machine.
5. Open front door all the way to ensure that it does not rub on or interfere with the cart legs. If the door should come in contact with the cart legs, gently pull the cart legs apart to ensure there is noncontact between the door and the cart legs.
6. Securely tighten all the screws at this point.
7. Place the laser system in the desired location for operation.
8. Attach your exhaust system’s wire-reinforced rubber hose to the exhaust port at the rear of the laser system and secure with a hose clamp.
System Assembly VLS6

1. Unpack the laser system.
2. Move the laser system to the location in which you intend to operate it and lock the casters.

Note: If it becomes necessary to move the laser system through narrow doorways to install in its intended location, the system can be detached from the cart and transported in two pieces. If so, follow the steps below, if not, skip to step 3.

a. In the back of the system, locate the access panel shown below and remove the four screws holding it in place.

b. Locate the three white connectors and the two black connectors and disconnect all of them.
c. Open the rear cover of the laser system.

d. Locate the pocket (1) where the cables disconnected in step b reside. Gently pull the cables up and rest them on top of the sheet metal as shown below.

e. Close and latch the rear cover.

f. Tape the front and top doors closed using strong shipping tape, prior to lifting the laser system off the cart, to ensure they stay closed.
g. Locate and remove the eight screws that attach the cart to the laser system (see below).

h. Lift the laser system off the cart and place the laser system front door down on a dolly for transport.

i. The cart and laser system can now be moved separately to the install location.

j. Reassemble in reverse order by placing the cart into position first and locking the casters. Then, carefully line up the laser system and place it back on top of the cart.

k. Bolt the laser system to the cart, re-connect the plugs and replace the access panel.
Laser Cartridge Installation

1. Make sure that your laser system power cord is not plugged in at this time. Open the rear laser cover using the latches on top of the laser cover. Some laser systems are shipped with keyed locks so make sure the latches are unlocked.

Note: Access latches for the laser cover are lockable. If you lose your keys, please contact our Customer Service Team at 480-609-0297 (USA), +43 1 402 22 50 (Austria), +81 (45) 224-2270 (Japan) or e-mail us at support@ulsinc.com for new keys.

2. Locate the mounting blocks (1), the laser latches (2) and alignment forks (3). Notice that the alignment fork has a groove (6) located between two blocks, one short (4) and one tall (5).

3. Locate the "V" groove along the upper (3) and lower (2) part of the laser cartridge base plate and the alignment plate (1) at the end of the base plate.
4. Pick up the laser cartridge by the ends and tilt it at a 30° angle as shown (1). Mount the cartridge onto the mounting blocks shown in step 2 by placing the upper “V” groove on top of the mounting blocks. Slide the cartridge to the right until the outer edge (2) of the alignment plate contacts the inside edge of the tall block of the alignment fork.

5. Slowly rotate the laser cartridge down into place, making sure that the alignment plate is centered in the groove in the alignment fork. The laser should click onto the spring loaded laser catch shown in step 2 to lock it in place. Never force the laser onto the laser latch. If the laser does not install smoothly, check for obstructions such as pinched wires or hoses or a binding laser latch. Once installed, verify that the alignment plate is centered within the alignment fork.
6. Plug in each power connector (1) to the corresponding laser cartridge.

7. Gently close the rear cover, making sure not to pinch any wires or hoses.

8. Once the laser cartridges have been installed, proceed to “Laser System Leveling.”
Laser System Leveling

Once the laser system is in place, you should lock the casters and level the laser system using the leveling nuts provided on the laser system casters. This will ensure the laser system is not twisted due to unlevel floors which can affect laser beam alignment and Z axis binding.

1. Place a bubble level (1) across the front (2) and rear cart legs (3). Adjust the caster height using the adjustment nut (4) until both the rear and front of the cart are level with respect to each other. Once the system is level, secure all casters by tightening the locknut (5) up against the cart leg.

2. Remove any remaining packing materials and accessories from inside the machine including items such as elastic bands that may have secured the motion system in place for shipping.

3. To check level in the machine, move the Focus Carriage by hand to the upper left corner.
4. Place the focus tool* against the black lens plate (focus carriage) so that the flat edge of the focus tool rests against the front side of the focus carriage as illustrated. Take note of the fit of the focus tool (it should look like the diagram to the right) in the upper left corner of the system. This corner will be your reference point.

*Alternate leveling method available. See the end of this section.

5. Using the upper left corner as a reference point, move the focus carriage by hand to each corner and take note of any differences between the fit of the focus tool in the upper left corner of the field and the fit of the focus tool in each of the other corners.
6. If one or more of the other corners does not match the upper left corner, loosen the lock nut and adjust the caster directly underneath that corner up or down until the focus tool fit at that corner matches the fit at the upper left corner. First loosen the lock nut (1), then turn the adjusting screw (2) in 1/8 turns. Once the foot is at the correct height, tighten the lock nut (1). When you are done, the focus tool fit at all four corners should be the same.

*Alternate leveling method
For the best leveling results, use a digital caliper and adjust the caster directly under each corner that does not match the height of the upper left corner until that corner matches the upper left corner’s height. Verify that you zero out the caliper before taking any measurements. The height at each corner should be within 0.010" (0.254 mm) of the height at the upper left corner.
Finalizing the Connections
Make the following connections in the order described; otherwise static electricity can potentially damage the computer and/or the laser systems electronics.

1. Connect the 4-inch (101.6 mm) flexible rubber exhaust system to the rear of the laser system.
2. Connect the laser system’s power cord and your computer’s power cord to a grounded electrical outlet.

   **CAUTION:** International users - if using an adapter or replacement power cord for local outlets, make sure that you attach the adapter correctly to the power cord and that you are using a properly grounded (earthed) adapter and power.

3. Do not power on the laser system at this time.

4. Locate the Thermal Sensor battery holder drawer on the side of the laser system. Install the provided 9-volt Thermal Sensor battery using a flat head screw driver to open the drawer.

   **Note:** A properly installed 9-volt battery is necessary to operate the laser system. The laser system will not function without a charged battery installed. Keep a spare 9-volt battery on hand at all times.

5. Connect the USB cable provided with the laser system between the USB port of the computer and the USB port on the back of the laser system.

   **CAUTION:** The laser system is USB 2.0 Hi-Speed (only). The laser system comes equipped with a high quality, 6-ft (2.0 meter) USB 2.0 certified cable. We recommend you use this provided cable. Do not use any adapters, extension cables, USB cables longer than 6 ft (2.0 meters) or other devices between the computer’s USB port and the port on the laser system; sporadic or unpredictable behavior may result.
6. After connecting the USB cord, the *Found New Hardware Wizard* will open to install the drivers for the USB connection. If the wizard offers to connect to *Windows Update* to search for software, select "No, not at this time." Then select "Next" to continue.

   a. Select "Install the software automatically." Then Select "Next" to continue. You do not need to insert the Software Installation CD-ROM.

   ![Found New Hardware Wizard](image)

   b. Select "Finish" to close the Wizard.

   ![Completing the Found New Hardware Wizard](image)

   **Note:** Another set of New Hardware Wizard windows may appear after the initial USB connection. Follow the same instructions as mentioned previously. Once completed, your USB connection is established.
Checking Beam Alignment
As a final step in the installation process you need to check your beam alignment. You do this using the red pointer beam.

1. Open the top door.
2. Place a small piece of masking tape across the 3/4” (19 mm) hole in the focus carriage (1). Gently rub the tape around the edge of the hole so that you can see the outline of the hole through the tape (2).
3. Power on your computer and verify that the Universal Control Panel (UCP) icon is present in the taskbar. If not, activate it by selecting the “Universal Control Panel” icon on your desktop.
4. Power on the laser system by pressing the Power switch on the side of the laser system.
5. With the top door open, a red dot will appear on the masking tape (3). The red dot should appear centered, within 1/8 inch (3 mm). If not, turn off the laser system, remove and re-install the laser cartridge and try again. If the red dot still does not appear centered, please contact our Customer Service Team at 480-609-0297 (USA), +43 1 402 22 50 (Austria), +81 (45) 224-2270 (Japan) or e-mail us at support@ulsinc.com.
6. Once you have completed laser beam alignment verification, remove the masking tape.

Accessories
Your laser system includes various accessories such as a cutting table for cutting applications and ULS Computer Controlled Compressed Air Unit, along with cone and backsweep for air assisted material processing. The accessories section of the manual details how to install and use these accessories.