# FOM2-3015NT 4kW Pre-Installation Guide

# FOM2_3015NT_4kW $CO_2$ Laser Pre-Install Guide

Pre-installation guide for FOM2_3015NT_4kW $CO_2$ Laser:

## Preparation

The following information will help prepare for the arrival and timely installation of the laser machine. Amada's laser consultant will help evaluate the site and offer any suggestions.

- Floor
  - It is recommended that machine be anchored to single, continuous foundation
  - Amada will not confirm the quality and readiness of any floor or foundation. If there is any question regarding the foundation, Amada recommends using an expert in that area to evaluate if the foundation matches Amada requirements.
- Location of machine
  - Machine must be placed at least 36" from walls or other obstructions
  - Must have at least 40" of clearance between the top of the machine to the ceiling
- Location of ancillary components
  - Position of chiller and dust collector are flexible
  - Chiller, dust collector, and any other components that are separate from the core machine must also have clear access to panels and doors
  - Chiller must have adequate air flow
- Your Amada laser consultant can provide you with layout drawings of the machine, dust collector, and chiller

## Component Size and Weight (approximate, uncrated)

| Unit | Model | L | W | H | Weight |
|---|---|---|---|---|---|
| Laser Machine | FOM23015NT | 22' | 9' | 8' | 22,000 lbs. |
| Shuttle Table | LST3015M2A | 11' | 8' | 3' | 6,000 lbs. |
| Chiller | RKE15000 | 5'7" | 3'2" | 6'2" | 1,323 lbs. |
| Dust Collector (only one) | GS4P | 5'2" | 4'5" | 9'4" | 2,250 lbs. |
| | TG4 | 7' | 4' | 7' | 2,000 lbs. |

*Notes on sizes and weights:

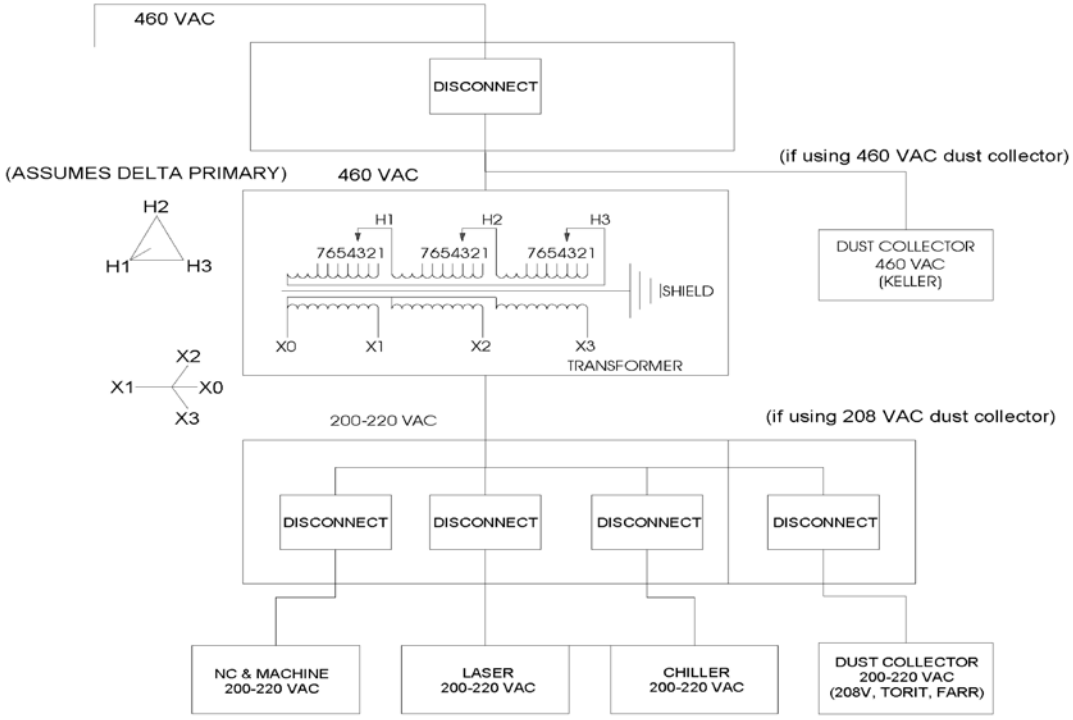
- These are uncrated weights and dimensions
- Amada's traffic department will help coordinate an additional information with your riggers
- Amada's traffic department will also coordinate shipping of all components

## Power Requirements

| Unit | Model | Voltage | Power Capacity kVA | Full Load Amps | Feeder Breaker Requirements (A) |
|---|---|---|---|---|---|
| Laser Machine | FOM23015NT | 200 | 12 | 34.7 | 50 |
| $CO_2$ Oscillator | AF4000iC | 200 | 55 | 159 | 225 |
| Chiller | RKE15000 | 208 | 28 | 77.8 | 100 |
| Dust Collector (only one) | GS4P | 208 | 9 | 25 | 50 |
| | TG4 | 208 | 12 | 33.4 | 50 |

*Notes on power requirements

- Full Load Amp calculated as: A=(kVA x 1000)/(V x 1.73)
- Please base installation on Feeder Breaker Requirements
- All components are 3 Phase and 60Hz
- A step down transformer may be required. This can be purchased from Amada or your local electric supplier
- A separate disconnect is recommended for each component
- A good ground is important for protecting the laser and all electrical components. A grounding rod near the machine is generally recommended. Consult with your electrician to make sure the laser is properly grounded.
- The electrical specifications are the requirements for installation only. These do not reflect the power consumption or usage during operation. In almost all cases, consumption during MAXIMUM load would reflect half of these values. Refer to the operating cost sheets for actual maximum power consumption during machine operation.




SAMPLE WIRING LAYOUT

# FOM2_3015NT_4kW $CO_2$ Laser Pre-Install Guide

## Air Requirements

| Unit | Model | Air | | |
|---|---|---|---|---|
| | | SCFM | PSI | ISO 8573.1 |
| Laser Machine | FOM23015NT | 10.6 | 100 | 2-4-3 |
| Dust Collector (only one) | GS4P | 15 | 90 | 4-4-1 |
| | TG4 | 9 | 90 | 4-4-1 |

*Notes on air quality and requirements:

- Air must be clean and dry. An air dryer may be required
- Minimum I.D. for air line is ½" (3/4" recommended)
- What is ISO 8573.1 Standard? It is a uniform way to specify air quality in terms of particulate size, pressure dew point, and oil content. The following table lists the maximum content in each category

| ***Quality Class*** | ***Particulate Size*** ***(Microns)*** | ***Pressure Dewpoint*** | ***Oil Content*** |
|---|---|---|---|
| *1* | *0.1* | *-70°C (-94°F)* | *0.01 mg/m³* |
| *2* | *1* | *-40°C (-40°F)* | *0.1 mg/m³* |
| *3* | *5* | *-20°C (-4°F)* | *1 mg/m³* |
| *4* | *15* | *+3°C (37°F)* | *5 mg/m³* |
| *5* | *40* | *+7°C (45°F)* | *25 mg/m³* |

## Water Requirements

| Unit | Model | Volume |
|---|---|---|
| | | **Distilled Only!!!** |
| Chiller | RKE15000 | 42 gal. |

*Notes on water requirements:

- Do not use deionized water. Only use distilled water. Some chiller units my come equipped with a deionizing unit, however, this is designed to function with distilled water only
- Additional water may be required during installation to fully fill any water lines.
- Only use water additive recommended by Amada service

## Assist Gas

| Assist Gas Maximum Pressures | | |
|---|---|---|
| **Gas** | **Input Port** | **Max. Pressure** |
| Oxygen ($O_2$) | Oxygen | 150 psi (10.3 bar) |
| Nitrogen ($N_2$) | Nitrogen High Pressure | 350 psi (24.1 bar) |
| Compressed (shop) Air | Air | 150 psi (10.3 bar) |
| N2 Generator (EZM) | EZ-Cut | |

*Notes on assist gas:

- Oxygen – commonly used when cutting mild steel and occasionally S.S.
- Nitrogen – used for Clean Cut™ of stainless and aluminum for oxide free edge
- Air – used for cutting thinner materials at reduced cost
- EZM – air compressor with N2 membrane system (optional)
- PSA (Pressure Swing Adsorption) – high pressure/purity N2 generator (optional)
- Liquid gas will "boil off" at a minimum rate even when not in use. If $O_2$ or $N_2$ will be used infrequently, it may be best to use high pressure cylinders
- Higher gas purity will result in faster cutting and better edge quality
- **IMPORTANT:**
    - When using liquid $N_2$ & $O_2$ at high flow rates an evaporator is required (NOT supplied by Amada). FAILURE TO USE AN EVAPORATOR WILL RESULT IN FROZEN GAS LINES IN THE LASER MACHINE THAT WILL BREAK. AMADA IS NOT RESPONSIBLE FOR DAMAGE CAUSED BY FROZEN GAS LINES.
    - When using with Shop Air as an assist gas it is extremely important the air being supplied is clean and dry. Moisture or oil will damage the cutting lens and shorten optic life.

## Laser Gas

| Laser Gas Mix | | |
|---|---|---|
| **$CO_2$** | **He** | **$N_2$** |
| 5% | 60% | 35% |
| +/-0.25% | +/-2.0% | +/-2.0% |

*Notes on laser gas:

- Amada recommends Bottle Certified Gas only
- Minimum purity requirement of 99.99% or higher
- Moisture content of 5ppm max.
- Hydrocarbon CnHm of 1ppm max.
- If gas is not mixed to these specifications, laser will not run properly
- More gas is consumed during installation than during normal use

## Floor (Foundation) Requirements

| Floor Irregularity Limit | Vibration Tolerance | | Ceiling Height |
|---|---|---|---|
| | Max. Allowable Acceleration | Max Allowable Amplitude | |
| 0.4” | 0.05G or 1.61 $ft/s^2$ | 16.4 x $10^{-6}$ ft. | 10 ft. |

*Notes on foundations:

- First, you have made a substantial investment in state of the art technology. If there is any question about the floor, Amada highly recommends taking the necessary steps to verify it’s condition up to and including pouring a new foundation. This is a minimal investment compared to the machine and is insurance towards trouble free operation.
- Amada recommends a single, continuous, and level slab foundation
- Make sure columns, walls, or other obstacles are not present in maintenance areas
- Anchor bolt holes will be drilled once machine is set in place
- **IMPORTANT**: Customer must determine if the floor is level prior to arrival of machine
    - If floor does not meet the above irregularity limit the machine may not be properly leveled and may have to be moved at customer expense
    - Some floors may look great but be too thin. If there is any question as to floor thickness Amada recommends having a core sample performed to verify
    - The employees of Amada are not experts in concrete or civil engineering. Therefore they can only provide recommendations and specifications for how a floor should respond to vibrations. Thickness requirements will vary depending upon the environment, geographical hazards, and the ground directly beneath the floor itself.

## Safety

All laser machine tools sold and installed by Amada America meet all applicable requirements of the Food and Drug Administration, Department of Health and Human Services, and Code of Federal Regulations, specifically 21CFR. In addition, all laser machine tools sold and installed by Amada America meet all applicable requirements of ANSI B11.21 American National Standard for Machine Tools Using Lasers for Processing Materials- Safety Requirements for Design, Construction, Care and Use.

According to ANSI Z136.1 (American National Standard for the Safe Use of Lasers) section 1.3.1, since this machine is classified as a "Class 4" laser it will be the responsibility of the end user to establish a Laser Safety Officer (LSO) to "monitor and enforce the control of laser hazards and to effect the knowledgeable evaluation and control of laser hazards". OSHA (Occupational Safety & Health Administration) does adopt this ANSI recommendation and therefore may require that your facility have an LSO. There are groups that can help you establish an LSO and implement a laser safety program. Please contact one of the following groups for more information:

International Laser Consulting and Engineering (www.lai-international.com)
Laser Institute of America (www.lia.org)
Rockwell Laser Industries, Inc. (www.rli.com)
Please contact Amada for more information.

Dear Valued Amada Customer,

Congratulations on the purchase of your new Amada laser system! You have invested in the finest laser system on the market today. We at Amada would like to thank you for your business and welcome you to our family.

This pre-installation guide & checklist has been created to ensure that your facility is ready for an Amada Service Technician to begin the installation of your new Amada laser. Please review the laser Pre-Installation Guide for your specific machine and model. If you have any questions regarding the model and ancillary components you have purchased, please contact your Amada representative. Your Amada Laser Automation Consultant and your local Amada Service Technician can answer any questions you may have regarding this manual.

Only after the pre-installation items have been completed can Amada begin the installation of the laser machine. To ensure that all the necessary items have been completed, Amada will not begin installation until this checklist has been completed, signed, and dated by the chosen representative of your facility. This is a very important step in the process. Amada Service wants to provide the **very best** in service and support to all of our customers. In order to do this, we must make certain our Service Technicians' time is not lost waiting for completion of these items.

I want to thank you for your understanding and cooperation. By helping us make sure your facility is fully prepared, it will make entire process much smoother. Should you have any questions or comments, please contact your local Amada sales or service representative.

Sincerely,

Jason Hillenbrand
Laser Product Manager
Amada America, Inc.

**Pre-Installation Checklist:**

- ☐ **Single, continuous, & level foundation slab for laser and shuttle table**

**NOTE:** Amada recommends the laser be installed on a single, level slab of concrete. Floor thickness may vary depending on several factors, but should be reinforced. Refer to page 5 of this document to determine what floor thickness is needed. Failure to meet these requirements can result in uneven settling or cracking of the floor causing various machine maintenance and functionality issues. Amada cannot be held responsible for issues caused from an inadequate floor.

- ☐ **Distilled water for the Chiller Unit**
  - **Pre-installation guide will give you amount required**
- ☐ **Two (2) bottles of laser gas mix (For CO2 Lasers)**
  - **Please make certain that ratio meets requirements for your machine**
- ☐ **Assist Gas**

**NOTE:** Liquid N2 will "boil off" at a minimum rate. If used infrequently or in low volumes, it may be best to purchase high pressure cylinders.

**NOTE:** The process of cutting with N2 requires much higher pressures and volumes than with O2. If using liquid N2, Amada strongly recommends some means of ensuring the gas will remain in a gaseous state. Most commonly used is an evaporator or vaporizer; however there are other means to accomplish this. Please consult with your gas supplier on what is the best method for your facility.

**CAUTION:** Failure to use a vaporizer or alternate method with liquid N2 gas can result in the freezing of the gas supply lines on the Amada laser system. **In the event this occurs, severe damage will occur to electrical, mechanical, and pneumatic components. It will be the responsibility of the end user to cover the costs involved with repairing these items.**

- ☐ **Power run to machine for all components**
- ☐ **Breaker for Laser, Chiller, Dust Collector, and NC & Machine**
- ☐ **Compressed Air**
  - **Please note the specific requirements for the air cleanliness and dryness**
  - **When using compressed air for cutting, pressure requirements will increase. Please see the pre-installation guide or discuss with your Laser Automation Consultant.**

I, _____ have read the above checklist and verify that all necessary requirements have been completed and that the laser is ready for an Amada Service Technician to begin the installation. Any blatant omission of any of the above listed items that causes more than a day delay can result in a service charge.

_____ _____

Signature Date

_____ _____

Amada Representative Date