RUDOLPH TECHNOLOGIES

JetStep™2300 Lithography System

Facilities Requirements Manual

6-Inch Square Reticle
2X Reduction Lens

April 22, 2014
Part Number: 93-0949-0 Rev. B

Copyright Information

Disclaimer

Trademarks

Technical Support

Rudolph Technologies provides comprehensive after-sale support services to ensure that your automated lithography equipment operates efficiently. The services are designed to meet your requirements and to maximize system performance.

The following support services are available:

- Extended warranties
- Telephone/Fax/E-mail support
- System installation, operation, and maintenance training classes
- Field and factory services

How to Contact Rudolph Technologies

When calling, sending a fax, or sending e-mail to Rudolph Technologies, make sure to provide the serial number of your system. The serial number is used to track your system's performance.

Address	Rudolph Technologies, Inc. Lithography Systems Group 16 Jonspin Road Wilmington, MA 01887
Phone	001 (978) 253-6222
Fax	001 (978) 658-6349
Web site	www.rudolphtech.com
E-mail	wilmington_service@rudolphtech.com
Hours	Phone support provided seven days per week and 24 hours per day
Service Calls	Standard Terms and Conditions. Service time, parts, transportation, and living costs are charged to the customer. The minimum charge for services performed on any call to a customer's facility is four hours domestically or eight hours internationally (outside the lower 48 United States). All pricing is subject to change without notice.

Revision Table

Date	Rev.	Edits	Editor	Writer
6/1/2012	A	Initial release	JCD	MAF
6/28/2012	B	Revised cooling water req. & dwg. 93-0943-2	JG	MAF
7/6/2012	C	Revised power & air req., system dimensions, & three drawings	JG	MAF
7/13/2012	D	Revised product name on title page and page footers	SG	MAF
8/30/2012	E	Revised the crate list, water requirements, and power requirements	EF	MAF
4/3/2013	F	Rebranded as Rudolph Technologies	JB	MAF
7/2/2013	G	Revised air requirements	EF	MAF
4/21/2014	H	Revised electrical requirements	SP	MAF

Chapter 1: Introduction

In This Chapter

This chapter covers the following topics:

- About this manual
- Audience and training
- Related manuals
- Pre-installation requirements
- Rigging accommodations
- Safety and clothing

1.1 About This Manual

This manual provides critical information regarding facilities requirements for a JetStep™2300 Lithography System, hereafter called a JetStep2300 System.

- Clearances and dimensions
- Floor finish and vibration isolation requirements
- Ventilation and air quality requirements
- Plumbing, water, air, and vacuum requirements
- Electrical requirements
- Communications requirements
- Weight distribution and shipping crate specifications
- Checklist and sign-off sheet
- Rudolph Technologies and customer's approval form

1.2 Audience and Training

This manual is intended for facilities personnel who are responsible for preparing a wafer fabrication site for installation of a JetStep2300 System and related equipment. This includes complying with all the requirements described in this manual.

The facilities personnel need to be familiar with the needs and limitations of the site in which the JetStep2300 System is to be installed. They also need to plan for the requirements described in the following sections.

1.3 Related Manuals

The following manuals are part of the JetStep2300 System documentation set:

- *JetStep2300 Operator's Manual*, part number 93-0947-1
- *JetStep2300 Advanced Operator's Manual*, part number 93-0948-0
- *JetStep2300 Facilities Requirements Manual*, part number 93-0949-0
- *JetStep2300 System Maintenance Manual*, part number 93-0950-0
- *JetStep2300 Preventive Maintenance Guide*, part number 735146
- *JetStep2300 Reticle Design Guide*, part number 93-0961-0
- *JetStep2300 WaferCAD Tutorial*, part number 93-0967-0
- *JetStep2300 Acceptance Manual*, part number 93-0951-0
- *JetStep2300 System Interconnect Diagrams*, part number 93-0935-0

1.4 Pre-Installation Requirements

The customer is required to complete each of the pre-installation procedures in the checklist in the "Pre-Installation Checklist" on page 26 well in advance of the system's arrival date. Rudolph Technologies facilities engineers are available to discuss the system's installation requirements.

The customer is responsible for having the following items in place and operational prior to installation of the JetStep2300 System:

- A level, vibration-free floor able to support the entire weight of the JetStep2300 System (see "Floor Finish and Vibration Requirements" on page 7).
- A transformer and service disconnect switch for installations outside of North America (see "Electrical Requirements" on page 15).
- Water, air or nitrogen, vacuum connections, and a condensate drain which meet or exceed the specifications (see "Plumbing: Water, Air, and Vacuum Requirements" on page 11).
- Power connections which meet the specifications enclosed within (see "Electrical Requirements" on page 15).
- A standard, Secure Shell, strongly-encrypted connection between the Rudolph Technologies office and those JetStep2300 System Host Workstations that it remotely connects to (see "Communications Requirements" on page 19).

1.5 Rigging Accommodations

The customer is required to make provisions to accommodate the special rigging equipment that will be used during installation.

- The door and ceiling clearances required to accommodate the rigging equipment are greater than the clearances required for the JetStep2300 System itself. Refer "Clearances and Dimensions Diagrams" on page 5.
- Provide appropriate materials handling equipment (for example, fork lift appropriately sized for JetStep2300 System crates) and personnel for unloading the truck and moving JetStep2300 System components to the installation site on the delivery day.

- Contact Rudolph Technologies immediately if the necessary clearances cannot be provided for the rigging equipment so that alternate arrangements can be made.

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Wilmington, MA 01887

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1.6 Safety and Clothing

The customer is required to provide the following items:

- Training for Rudolph Technologies personnel on safety procedures for the facility in which the Rudolph Technologies system is to be installed.
- The appropriate clean room clothing (such as gloves, gowns, booties, and hats) during the installation.

Chapter 2:
Clearances and Dimensions Diagrams

In This Chapter

- This chapter provides information on clearances and dimensions.

See Appendix A for prints of these and other drawings.

- Shipping Weight and Dimensions (93-0943-0)
- Isolation Foundation, JetStep™2300 Lithography System (93-0943-1)
- Facilities Feedthrough (93-0943-2)

Chapter 3:
Floor Finish and Vibration Requirements

In This Chapter

This chapter covers the following topics:

3.1 Floor Finish

- Floor must be level and true to plane (±6 mm).
- Floor must be non-particulating.
- Floor must be non-perforated.
- Floor must be free of all properties that limit the ability to control static pressure within the enclosure.

3.2 Floor Vibration

Avoid sources of vibration.

Installing the JetStep2300 System on upper floors, near machine shops, near railroad tracks, or near any source of vibration may risk transmitting vibrations to the JetStep2300 System subsystems.

If necessary, reinforce the floor, remove sources of vibration, or install appropriate vibration isolation systems.

The JetStep2300 System should be placed on a floor where the vibrations do not exceed Criteria VC-B, which is shown in Figure 1 on the next page.

Vibrations below 4 Hz or above 80 Hz must not exceed 50.0 µm/sec.

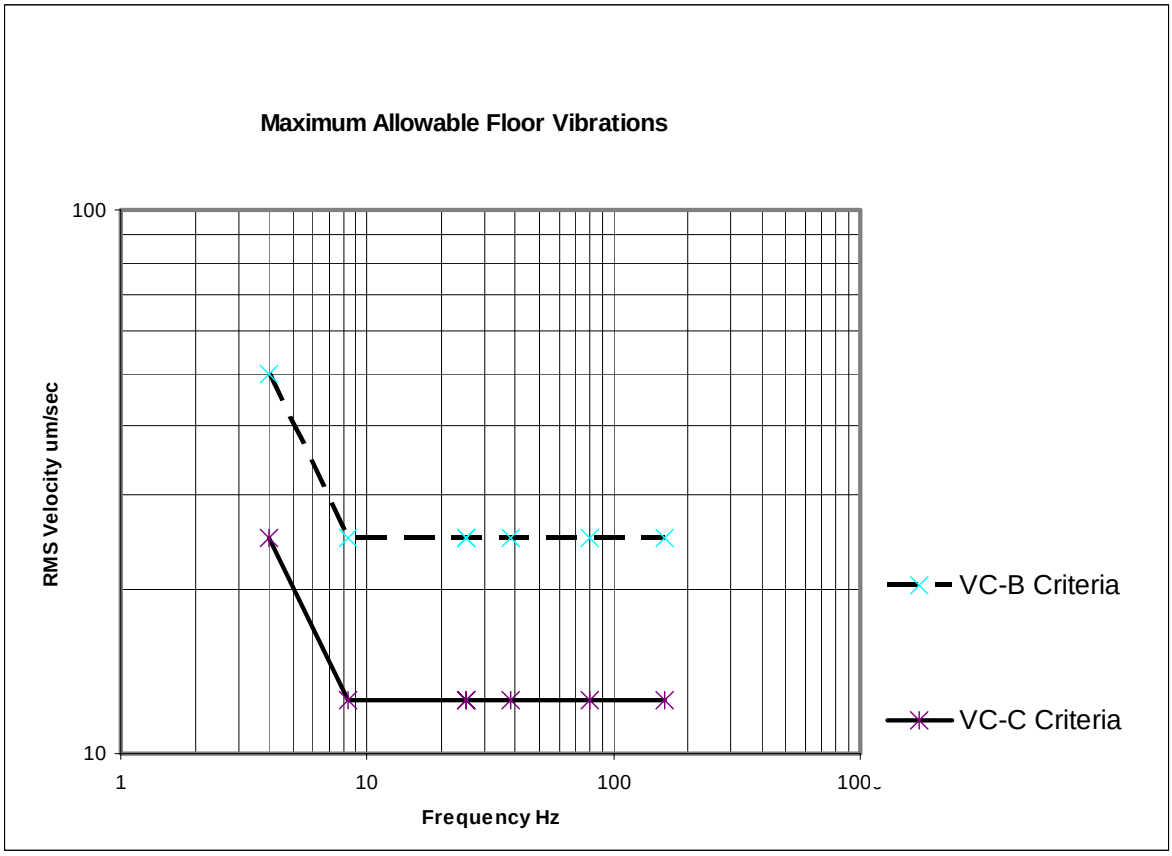


Figure 1: Maximum Allowable Floor Vibrations

Chapter 4:
Ventilation and Air Quality Requirements

In This Chapter

This chapter covers the following topics:

- Heat Loads
- Air Quality
- Ambient Temperature

4.1 Heat Loads

Total heat expelled from the JetStep2300 System is approximately 17.6 kw (60,000 BTU/hr). Most of this heat is removed by the chilled water and the Illuminator lamp housing exhaust.

Vent

Two venting fans and vent hoses are provided to force hot air from the Illuminator lamp housing and the Wafer Edge Exposure Unit to the outside of the building. Table 1 describes these items.

Table 1: Venting Equipment

Unit	Description
Fans	3.5 m^3/min
Vent hose	5 meters (16 feet) of 4-inch (102 mm) vent hose for Lamp House
Vent hose	5 meters (16 feet) of 4-inch (102 mm) vent hose for Wafer Edge Exposure Unit

Note

If necessary, connect additional hose and a helper fan to the exhaust. Contact Rudolph Technologies Product Support or a qualified ventilation contractor for more information.
Some cases require this exhaust be vented to a facility exhaust system because of the mercury (Hg) lamp.

4.2 Air Quality

The air cleanliness surrounding the JetStep2300 System must be a minimum of a Class 100 clean room.

Note

The flow rate of the Air Conditioning Unit (ACU) is adjustable and the corresponding air change rate in the Environmental Enclosure is 9 to 12 air changes per minute.

4.3 Ambient Temperature/Humidity

The ambient temperature and humidity for the JetStep2300 System is defined as follows:

- Temperature set point for the Enclosure is from 20 to 24 °C.
- Ambient temperature is to be within ±2.0 °C of the Enclosure's set point.
- Relative humidity is to be 45 to 60%.

Chapter 5: Plumbing: Water, Air, and Vacuum Requirements

In This Chapter

This chapter covers the following topics:

- Water lines and drain requirements
- Air requirements
- Vacuum requirements

5.1 Water Lines and Drain Requirements

The water supply and drain should be located in the rear of the system.

Cooling Water

Cooling water is required for the Air Conditioning Unit (ACU) and the Illuminator. Use the recommended water temperature to avoid condensation on the plumbing. See Table 2 for details.

Table 2: Water Cooling Requirements: Minimum to Maximum

Unit	Pressure Range	Flow Range	Temperature Range
ACU	210-500 kPa (30-72 psi) Min. pressure change: 210	8 liters/min. @ 18° C (2.1 gpm @ 64° F) or 10 liters/min. @ 25° C (2.6 gpm @ 77° F)	18-25° C (64-77° F)
Illuminator	345-690 kPa (50-100 psi)	4 liters/min. @ 15° C (1.0 gpm @ 59° F) or 10 liters/min. @ 25° C (2.6 gpm @ 77° F)	15-25° C (59-77° F)

Note

The pressure differential between the supply and return lines must be a minimum of 138 kPa (20 psi) at 15°C (59°F) and a maximum of 241 kPa (35psi) at 21°C (70°F).

The following components are required:

- **Inlet:** 1/2-inch BSPT (British Standard Pipe Thread) female threaded fittings (to be connected to the source by Rudolph Technologies personnel using flex) located near the water inlet and outlet at the ACU unit, and ball-type shutoff valves.

- **Outlet:** 1/2-inch BSPT female threaded fittings (to be connected to the source by Rudolph Technologies using flex) located near the water inlet and outlet at the Illuminator, and ball-type shutoff valves.
- **Filtered cooling water:** Treated with chemicals that will inhibit the growth of bacteria, without causing significant material degradation in brass, aluminum, stainless steel, polyethylene, and polypropylene.

Note

We recommend using 20 µm filters, in parallel, so that the filters can be changed by isolating one line while maintaining flow. See Figure 2 for details.

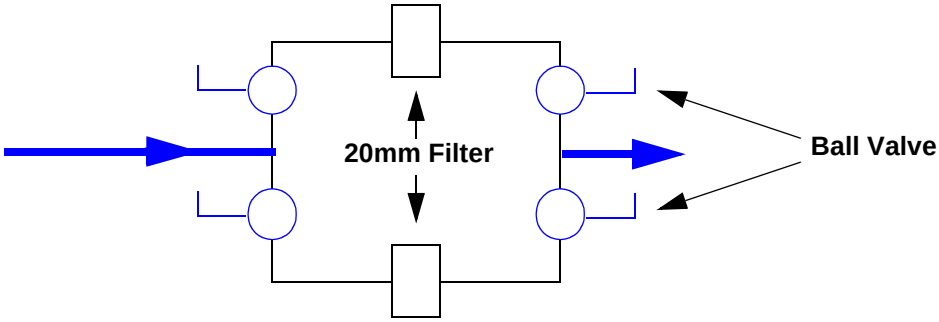


Figure 2: Recommended Water Valves and Filters

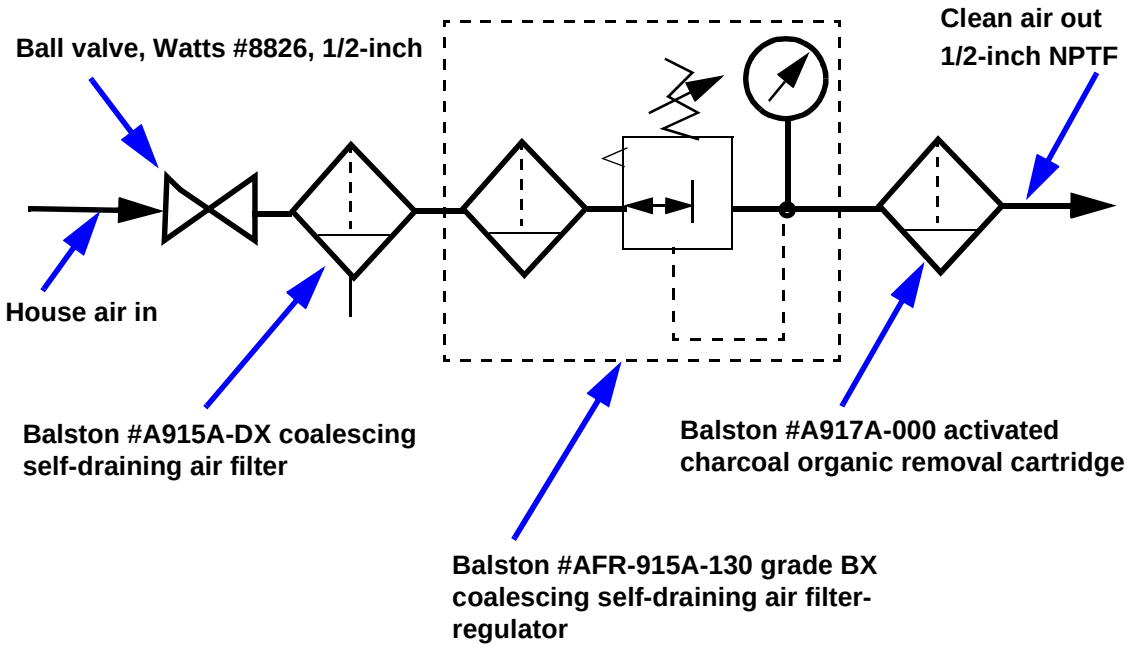
Drain

A properly located and sized condensate drain for ACU is required. The ACU has a 1/2-inch BSPT (female) connection (to be connected to the source by Rudolph Technologies personnel using flex) near the lower corner of the unit for drainage. The drain is gravity fed, so the customer may need to provide a condensate drain pump in some facilities.

5.2 Air Requirements

The air supply should be located in the rear of the system. The following components (shown in Figure 3) are required:

- One dry compressed gas source (clean dry air (CDA) or nitrogen) with 1/2-inch NPTF female fittings (to be connected to the source by Rudolph Technologies personnel using flex), and ball type shutoff valve. The connection must be within 3 m (10 feet) of the JetStep2300 System.
- Regulated air pressure of 100 psig (690 kPa) at 8.0 scfm (227 (standard liters/min.).
- Gas pressure flow rates must be provided at the interface connection points, not at remote locations.
- Compressed air must be filtered to remove all particulates 0.5 µm or larger.
- Compressed air water vapor must be reduced to 1000 ppm (by weight), or have a dew point of -15°C (5°F) at atmospheric pressure.
- Self-draining coalescing air filters should be installed at the point of use to remove any condensate that may form in the air line.
- Hydrocarbons must be reduced to a level of less than 8 ppm.



Note: Parts provided and installed by customer

Figure 3: Recommended Compressed Air Filtration

An air pressure amplifier (Model # 4AAD-Z) is available from the Haskell Company in Burbank, California. The telephone number is (818) 843-4000.

Note

This amplifier generates 85 dBA of noise.

5.3 Purge Gas Requirements

Clean dry air or nitrogen gas is used to purge the lens to minimize photopolymerization of organic vapors on the optical surfaces from the i-line radiation. Install a regulator and shut-off valve within a short distance of the front left side of the JetStep2300 System location.

The gas source should have the following characteristics and capabilities:

- Clean dry air or nitrogen.
- Purge Gas Specification: Purge gas that enters the objective is to have SO_2, SO_x, NO_x, H_2S, H_20, CO_2, siloxanes, hydrocarbons (C_6 to C_{30}), ammonia, amines, acid gases, and alcohols at less than 1 ppb (part per billion) levels.
- Purity 99.999% (O grade or better).
- Total hydrocarbons (THC) less than 0.5 parts per million (ppm).
- Recommended filter: Aeronex Optics gas purifier series filter or equivalent that meets the preceding purge gas specification.

> **Note**
>
> The purity of the clean dry air or nitrogen upstream from the filter will greatly affect the filter's life before regeneration is necessary. The end user must contact the filter manufacturer to determine the required upstream purity necessary for acceptable filter life and the maintenance schedule for regeneration.

- Regulated pressure of 0.25 psi (13 mm Hg). Supply plumbing to the JetStep2300 System is 1/4-inch OD x 1/8-inch flexible tubing.
- Flow rate: 4.2 L/min. minimum.

5.4 Vacuum Requirements

The vacuum supply should be located at the rear of the system.

- One vacuum connection with 1/2-inch NPTF female fittings (to be connected to the source by Rudolph Technologies using flex), and ball type shutoff valve.
- Vacuum pressure to be -22 to -25 in. Hg. (-75 to -85 kPa) at 6.0 scfm (170 standard liters/min).
- Vacuum flow rates must be provided at the interface connection points, not at remote locations.

Chapter 6:
Electrical Requirements

In This Chapter

This chapter covers the following topics:

6.1 Required Details

The following electrical details are required for all installations:

- Individually fused power line for exclusive use of the JetStep2300 System.
- Neutral conductor sized to 100% of the phases.
- All connections should be within 3 m (10 feet) from the left side of the JetStep2300 System.
- One service disconnect for 3-phase power.
  208 VAC ±10%, 50/60 Hz, 150 Amp, 3 phase, 5 wire Wye
- Two single phase outlets that match local outlet configurations, as shown in Figure 4.
- Transformer, as required, for installations outside of the United States.
- Power inlet size: 200 mm x 50 mm at bottom power panel.
- Ground wire for a system rated at 150 A must be AWG #1
- All ground wires must terminate at a single stud with no stacking of ground wires.
- The facility supply termination point must be marked **PE**.
- Short circuit current rating of the Enclosure power panel is 5 kA.

United States

The following electrical requirements pertain to installations in the United States:

208 VAC ±10%, 150 Amp, 60 Hz, 3-phase, 5-wire Wye

Japan

Locations with 100/200 VAC Delta require a transformer, supplied by the customer. The transformer should be hard wired to a circuit breaker sized to protect the transformer, also provided by the customer. The load side of the transformer will be connected by Rudolph Technologies personnel.

208 VAC ±10%, 150 Amp, 50/60 Hz, 3-phase, 5-wire Wye

Europe

Locations with 220/380 VAC Delta or Wye (star) require a transformer, supplied by the customer. The transformer should be hard wired to a circuit breaker sized to protect the transformer, also provided by the customer. The load side of the transformer will be connected by Rudolph Technologies personnel.

208 VAC ±10%, 150 Amp, 50/60 Hz, 3-phase, 5-wire Wye

6.2 Wye Electrical System

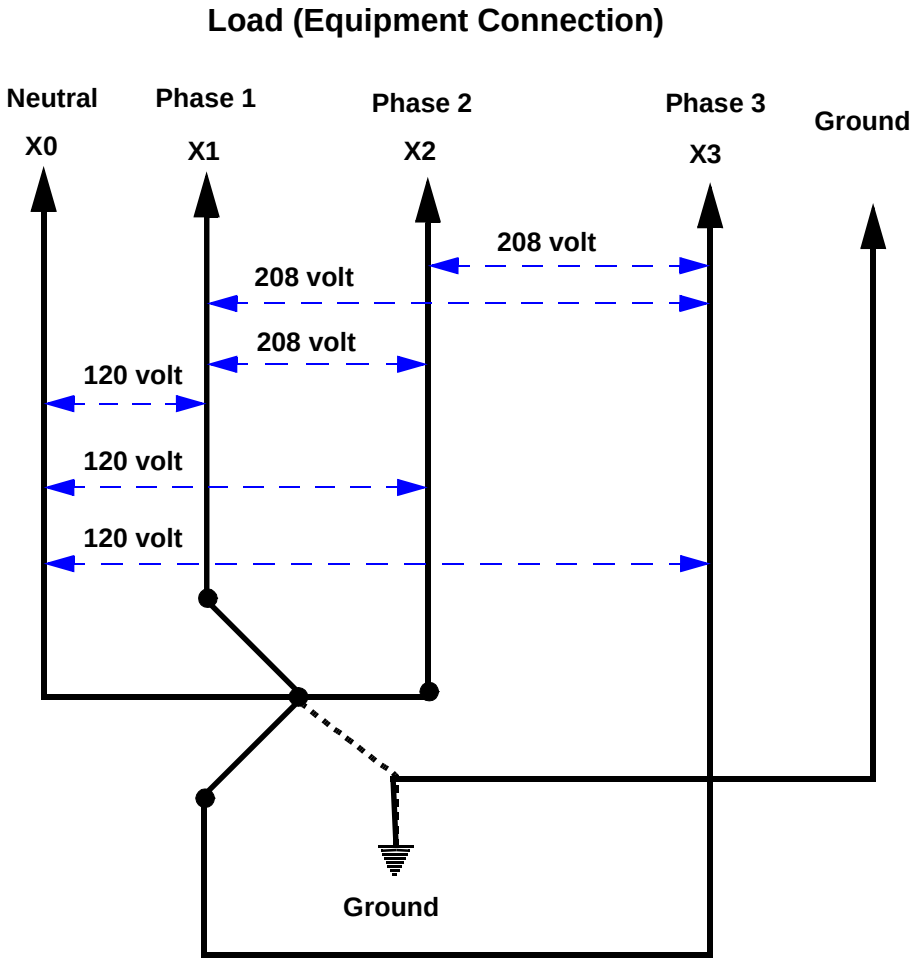


Figure 4: Wye Electrical System

Note

This electrical configuration is required by the JetStep2300 System.

6.3 Delta to Wye Conversion Transformer

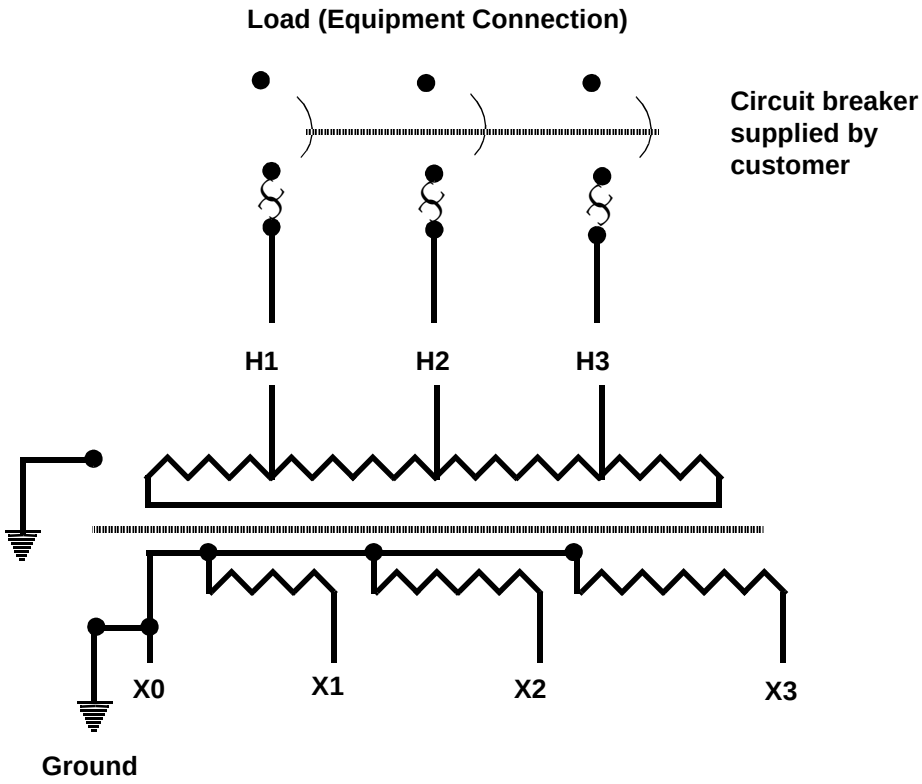


Figure 5: Delta to Wye Conversion Transformer

Connect three high voltage phases (H1, H2, H3) from the building's Delta system to the transformer at each of the appropriate phase taps.

Note

Install a transformer that is Wye configured on the load side. Three phase conductors, a neutral, and a ground are required for proper installation of the JetStep2300 System. The neutral must be connected to earth ground at the output of the transformer.

6.4 Delta Electrical System

WARNING

This system is not compatible with the JetStep2300 System. It is offered as an aid in selecting and installing a suitable transformer for converting to a 3-phase, 5-wire, Wye system. Refer to the previous diagrams.

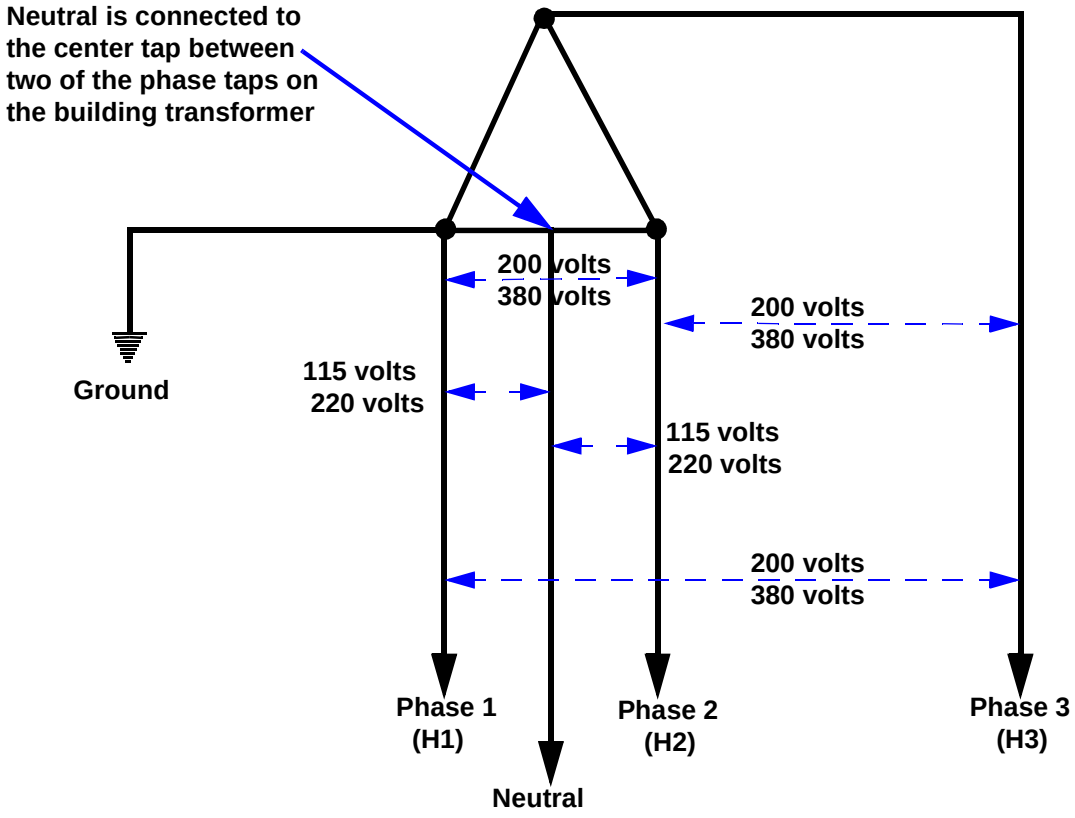


Figure 6: Delta Electrical System

Chapter 7:
Communications Requirements

In This Chapter

This chapter covers the following topics:

- Providing for remote support
- Supporting clusters of JetStep2300 Systems
- Advantages

Rudolph Technologies Software Support needs to have full remote access to a JetStep2300 System in order to provide timely response for offsite software support such as installing updates, troubleshooting, or running remote diagnostics.

7.1 Providing for Remote Support

To provide for remote support, Rudolph Technologies suggests using a standard, Secure Shell, strongly-encrypted connection between the Rudolph Technologies office and those JetStep2300 System Host Workstations that it remotely connects to. For this to work, the customer's firewall on the Internet must be programmed to forward connections from the Rudolph Technologies external (IP address 209.113.181.156, port 24442) to Ethernet port 1 on the remote Host Workstation's port 24442, as shown in Figure 7. No other packets should be passed through to the remote system.

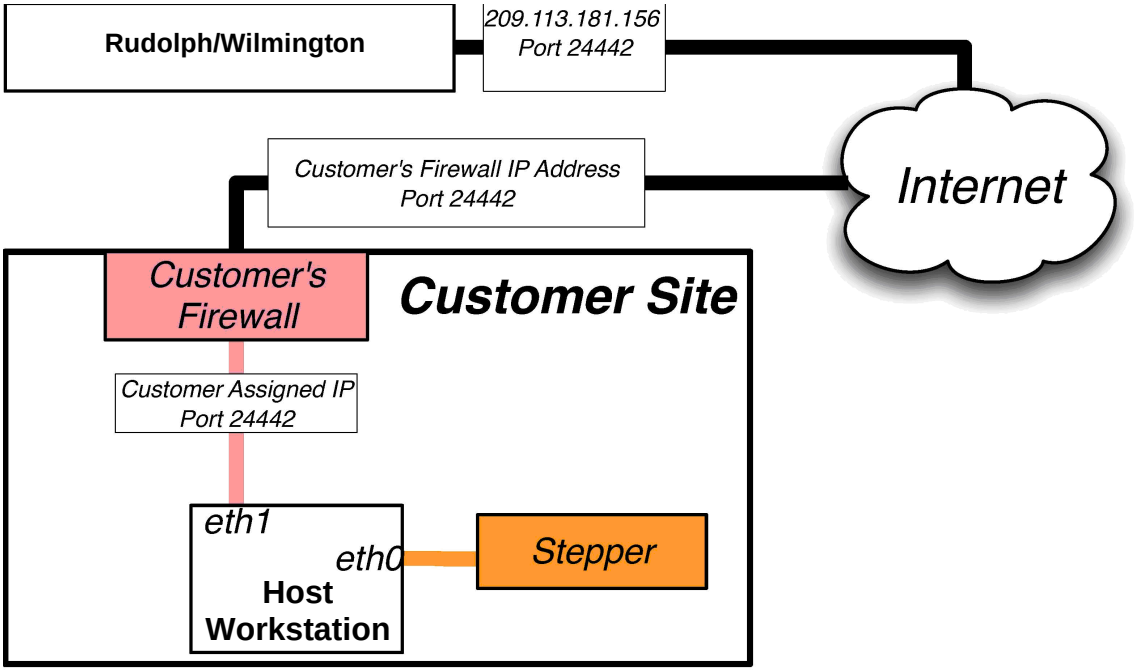


Figure 7: Recommended Method for Providing Remote Access

The following details explain the preceding diagram:

- The box labeled “Rudolph Technologies in Wilmington” is the Rudolph Technologies factory in Wilmington, MA, USA.
- The IP address 209.113.181.156 is the IP address for IP packets leaving the Rudolph Technologies site.
- Port 24442 is an unassigned, registered IP port that Rudolph Technologies uses to "tunnel" Secure Shell packets between Rudolph Technologies and the remote JetStep2300 System.
- The “Customer's Firewall” is the IP address for a customer firewall on the Internet that can forward packets to Ethernet port 1 on the remote system’s Host Workstation.
- The “Customer Assigned IP Address” is the IP address that the customer assigns to the Host Workstation on the customer's internal network.

7.2 Supporting Clusters of JetStep2300 Systems

Customers with clusters of JetStep2300 System can purchase a pre-configured firewall that will provide remote access to all the systems through a single internet connection. It will be possible to individually disable remote access to the JetStep2300 Systems. The customer firewall configuration will be the same, it will still only forward connections from the Rudolph Technologies IP address to the single port.

In the diagram in the next section the pre-configured firewall obtained from Rudolph Technologies would replace the Linux host, that is, the customer would forward connections to the pre-configured firewall instead of to a single Linux host's ethernet port 1. The pre-configured firewall will then forward appropriate packets to the individual systems.

7.3 Advantages

If the Secure Shell method is used, then the **Remote Lockout** menu option on the remote Host Workstation can be used to enable and disable remote access to the JetStep2300 System. If any other method is used to provide remote access, then the customer must supply its own method of disabling remote access to the JetStep2300 System (such as powering off a network switch) and ensure that there is no possibility of attack through the provided interface.

Chapter 8:
Shipping Weights and Crate List

In This Chapter

This chapter covers the following topics:

- Approximate weights for each component
- Weights at the load points
- Crate list
- Shipping guidelines

8.1 Approximate Weights for Each Component

Table 3 presents the weight for each major component of the system. For more details, refer to drawing 93-0943-0 in Appendix A.

Table 3: Weights of System Components

Description	Kilograms	Pounds
Mechanical Structure and Optics	5,000	11,023
Illuminator Rack*	---	---
Electronics Rack	445	981
Environmental Enclosure	874	1,926
Air Conditioning Unit (ACU)(HVAC)	576	1,269
Wafer Edge Exposure Unit (WEE)	140	309
Wafer Handler (EFEM) with Load Ports	996	2,195
Totals	**8,032**	**17,703**

*Illuminator Rack components are built into the Enclosure.

8.2 Weights at the Load Points

Table 4 shows the weight at each load point of each major system component of the JetStep2300 System. For more details, refer to drawing 93-0943-0 in Appendix A.

Table 4: Weights at the Load Points

Description	Kilograms	Pounds
Mechanical Structure and Optics	1,250	2755
Electronics Rack	111.2	245
Environmental Enclosure	218.5	482
Air Conditioning Unit (ACU)	144.0	317
Wafer Edge Exposure Unit (WEE)	35.0	77
Wafer Handler (EFEM) with load ports	249.0	549
Totals	**2007.7**	**4425**

Note

The Air Conditioning Unit (ACU) should be installed within 1.5 m (5 ft.) of the rear of the JetStep2300 System.

8.3 Crate List

The JetStep2300 System is shipped in several crates. Table 5 describes the contents, weight, and dimensions of each crate. Please review the shipping guidelines that follow the table and discuss them with your shipper.

Table 5: Crate Descriptions

Crate	Contents	Net Weight (kg)	Gross Weight (kg)	Volume (m^3)	Dimensions (cm) L x W x H
1	Isolators	839	918	2.3	173x145x91
2	Electronics Rack	445	518	2.6	122x89x244
3	Granite Base/Bridge/Camera Assy/ X-Y Stage/Reticle Library	5,000	5,750	7.4	164x200x227
4	Chamber Top Panels, Chamber Panels, Chamber Frame	874	1,155	12.9	265x205x238
5	Air Conditioning Unit (Upper)	349	545	5.9	265x166x133
6	Air Conditioning Unit (Lower)	227	317	2.1	194x102x106
7	Pneumatics Rack, Granite Interface, and Miscellaneous Components	1,214	1,305	9.9	239x224x185
8	Wafer Edge Exposure	140	150	0.8	68x68x167
9	Wheels and Jacks	287	397	0.5	76x117x56
10	Wafer Handler (EFEM)	227	272	5.3	164x155x210
11	Vision Loadport	94	114	0.6	59x148x72
12	Vision Loadport	94	114	0.6	59x148x72
	Complete System	**9,790**	**11,555**	**50.9**	----------

8.3.1 Shipping Guidelines

Transportation of the JetStep2300 System is not the responsibility of Rudolph Technologies. Based on prior experience, the following guidelines should be used by shipping companies in selecting proper vehicles used to transport JetStep2300 Systems.

- Air ride vibration control trucks that are capable of controlling temperature between 16 and 28 degrees C (61 to 82 degrees F) with less than 5 degrees C (9 degrees F) temperature change per hour.
- During the entire shipping process, temperature should be maintained at 16 to 28 degrees C with less than 5 degrees C temperature change per hour.
- Maximum 5 G shock.
- Dataloggers are to be placed in shipping crates to record the above parameters during shipment.

Chapter 9:
Checklist and Approval Form

In This Chapter

This chapter covers the following topics:

- A pre-installation checklist
- A detailed approval form to be completed after installation

9.1 Pre-Installation Checklist

The following items need to be completed and approved prior to the installation of the JetStep2300 System.

❒ Refer to “Clearances and Dimensions Diagrams” on page 5 and verify the following:

- Ability to access the doors on the illuminator and electronics racks.
- Enough ceiling clearance under sprinkler heads, lights, and other items.
- Clearance for ductwork.
- Floor loading.

❒ Verify that the air, vacuum, and water connections are complete to the specified locations.

❒ Verify that the overhead/rear ductwork is in place (if applicable).

❒ Discuss and inspect the route of travel from the loading dock to the installation area for the JetStep2300 System. Ensure the structure and floor finish is smooth and compatible with the specified rolling load. Determine the area to be used for unpacking, storing tools, and other tasks. Determine a method for disposing of packing materials.

❒ Verify that the floor is solid and level where the JetStep2300 System will be located.

❒ Verify that power available for the JetStep2300 System.

Refer to “Electrical Requirements” on page 15.

❒ Verify that there is a 20-amp service drop available for tools used during the installation.

❒ Verify that there is an air filtration system in the compressed air line between the compressor and the JetStep2300 System connection.

Refer to “Plumbing: Water, Air, and Vacuum Requirements” on page 11.

❒ Verify that the vacuum is installed as specified.

Refer to “Plumbing: Water, Air, and Vacuum Requirements” on page 11.

❒ Verify the ACU chilled water connection.

Refer to “Plumbing: Water, Air, and Vacuum Requirements” on page 11.

9.2 Customer Approval Form

A representative from Rudolph Technologies and the customer are to approve all the following system requirements after installation. This ensures that the installation was completed to the satisfaction of both parties.

System Requirements

		Customer Approval	Rudolph Technologies Approval	Notes
Electrical Power				
Phase	3-Phase (5-wire wye)			
Voltage	208 V ±10%			
Amp: A/Cap: KVA	150 31,200 VA			
Frequency: Hz	50/60			
Air				
Pressure: kPa	690 (minimum must be higher than 550)			
Flow: L/min	227			
Connection Size	1/2-inch NPTF (female)			
Temp: ^{o}C	17~24			
Filter Requirements	See details in (“Air Requirements” on page 13)			
Vacuum				
Pressure: kPa	-75 to -85			
Flow: L/min	170			
Connection Size	1/2-inch NPTF Female			
Exhaust	**Lamp House**			
Pressure: kPa				
Flow: m^3/min	4.3			
Hose Diam.	4-in. (102 mm)			
Temp: ^{o}C	below 60			

		Customer Approval	Rudolph Technologies Approval	Notes
Exhaust	**WEE Unit**			
Pressure: kPa				
Flow: m^3/min	2.8			
Hose Diam.	4-in. (102 mm)			
Cooling Water	**Illuminator**			
Pressure: kPa	345-690			
Flow: L/min	4-10			
Connection Size	1/2-inch BSPT (female)			
Temp: ^oC	15-25			
Purity	<20 µm filter			
Drain	1/2-inch BSPT (female)			
Dimensions	(±5 mm)			
W[mm]	3064			
D[mm]	2812			
H[mm]	2473			
Weight				
Weight: Kg (see Table 3 on page 21)	7,010*			
Environment				
Temp: ^oC	20-24 (within fixed temperature ±2.0)			
Humidity:%	45-60			
Vibration: M/sec^2				
Cleanliness	Class 100 or better			

*Mechanical structure and optics, Enclosure, EFEM, and WEE.

HVAC (ACU) Requirements

		Customer Approval	Rudolph Technologies Approval	Notes
Cooling Water				
Pressure: kPa	210-500			
Flow: L/min	8 @ 18 °C 10 @ 25 °C			
Connection Size	1/2-inch BSPT (female)			
Temp: ^{o}C	18-25			
Purity	<20 µm filter			
Weight				
Weight: Kg (see Table 3 on page 21)	576			

Electronics Rack Requirements

		Customer Approval	Rudolph Technologies Approval	Notes
Weight				
Weight: Kg (see Table 3 on page 21)	445			

Appendix A.
System Drawings

In This Appendix

This appendix provides the following drawings for reference.

- 2300 Main Assy. Shipping Weights (93-0943-0, sheets 1 & 2)
- 2300 Isolation and Foundation (93-0943-1)
- 2300 Main Assy. Facilities Locations (93-0943-2)
- Pneumatics Rack Cooling Water Containment (80-1188-1)

1. placeholder for drawing 93-0943-0 sheet 1

Insert the large drawings after Appendix intro page.

Insert them so top of drawing is at the top of page.

Delete this page and the following blank placeholder pages when done.

2. placeholder for drawing 93-0943-0 sheet 2

3. placeholder for drawing 93-0943-1

4. placeholder for drawing 93-0943-2

5. placeholder for drawing 80-1188-1