### 600i EQUIPMENT SITE PREPARATION GUIDE

KOF0409

•

**in line with your process**

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0 KDF IN-LINE SPUTTERING SYSTEM SITE PREPARATIONS 1

1.1 AMBIENTCONDITIONS ----------------------------------------------- 1

1.2 ELECTRICAL REQUIREMENTS------------------------------------------ 2

* 1. [WATER COOLING REQUIREMENTS 3](#_TOC_250005)

[1.4 AIR SUPPLY 4](#_TOC_250004)

[1.5 PROCESS GAS REQUIREMENTS 4](#_TOC_250003)

[1 .6 SYSTEM VENTING GAS REQUIREMENTS 5](#_TOC_250002)

* 1. [SYSTEM WORKING CLEARANCES 6](#_TOC_250001)
  2. 6001 SYSTEM LEVELING 7
  3. [KDF REMOTE SUPPORT 8](#_TOC_250000)

FACILITY SIGN OFF SHEET FOR NEW SYSTEM INSTALLATIONS 9

600i SYSTEM LAYOUT DRAWING KDF2165

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##### 600i EQUIPMENT SITE PREPARATION GUIDE

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#### KDF IN-LINE SPUTTERING SYSTEM SITE PREPARATIONS

The following utility connections are described in this document:

* Ambient Conditions
* Electrical
* Water Cooling
* Air Supply
* Process Gas
* System Venting
* System Working Clearances
* System Leveling
* KDF remote support

Note: Some aux equipment (compressor, mechanical pump, etc) may have specific utility requirements, which are not covered in this document. Reference those OEM manuals for more information.

#### AMBIENT CONDITIONS

* + 1. System

The KDF system will operate satisfactorily under the following ambient conditions:

* + - * Temperature- 65°F to 75°F (18°C to 24°C).
      * Relative humidity - 40% to 60% (Non-condensing).
      * Corrosive gases - None.
    1. Auxiliary Equipment

Auxiliary equipment that is part of KDF system, but which has been located in an adjacent service room (i.e. mechanical pumps, cryo compressors, power supplies, etc.), may operate in a less restrictive environment:

* + - * Temperature - 60°F to 80°F (15°C to 27°C).
      * Relative humidity- 30% to 70% (Non-condensing).
      * Corrosive gases - None.

**FYI:** System continuous weighted sound pressure level does not exceed 70 dB.

**WARNING:**

**EXPOSED CATHODE ASSEMBLIES HAVE STRONG MAGNETIC FIELDS.**

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Rev A 10/07

Page 1-1

600i EQUIPMENT SITE PREPARATION GUIDE

KDF0409

#### ELECTRICAL REQUIREMENTS

* + 1. Power Source

KDF systems will operate with following input voltage:

* + - * 208VAC, 3-phase, 100Amps.
      * 208VAC (5%, three phase WYE, 4 wire system, 50/60Hz).
      * 208VAC (5%, three phase, DELTA, 4 wire system, 50/60Hz).

**NOTE:** Connect 3-phase main service to main breaker box rear of system.

Earth / Frame ground should be used on all systems.

* + 1. Power Quality

The electrical power supplied to KDF system and to auxiliary equipment must be three-phase AC (Power Range A, as identified in **ANSI** C84.la - 1980. A 120V/208V nominal RMS utilization voltage having a modified minimum of 114V/198V and a maximum of 126V/218V, free of any spikes and noise).

* + - * The primary power source must not be shared with any electrical equipment that could produce excessive voltage dips, transient spikes or noise.
      * The primary power source must remain within 5% of nominal voltage.

**NOTE:** 10% nominal power fluctuation may cause process inconsistency.

* + - * A scope or voltmeter should be used to ensure items one and two (above) are complied with under all modes of system operation.

**WARNING:**

**ALL ELECTRICAL POWER WIRING UP TO AND INCLUDING THE MAIN** DISCONNECT **BOX,** MUST BE PERFORMED **BY A** LICENSED ELECTRICIAN WHERE **APPLICABLE AND** MUST COMPLY WITH ALL **NATIONAL,** STATE ' AND LOCAL CODES.

**THE CURRENT INTERRUPTING CAPACITY (OR AMPERES INTERRUPTING CAPACITY) OF** THE **SYSTEM MAIN DISCONNECT IS 10,000 AMPS.**



KDF Electronic & Vacuum Services Inc. Rev A 10/07

Page 1-2

# 600i EQUIPMENT SITE PREPARATION GUIDE

KDF0409

* 1. WATER COOLING REQUIREMENTS
     1. **KDF System Water Flow Requirements**

The water service must be continuous and be capable *of* supplying the flow rate of water at the differential pressure specified.

* + - * Flow rates are measured at system outlet.
      * System Inlet pressure 90PSIG maximum.
      * Differential pressure between system inlet and outlet, minimum of 60PSIG.
      * 6.5GPM supply to system (4.0GPM cathode loop).
    1. Water Quality

Water contaminants (hardness, dirt, iron and/or pH) can result in clogging or corrosion of water-cooling lines and components, resulting in an overheating condition.

To insure proper operation of system and maintain reliability of components, it is necessary to.

* + - * Maintain water resistivity greater than 4,000 OHM per cubic cm.
      * Maintain water inlet temperature at 50°F to 75°F (10°C to 24°C) and always-above ambient dew point *(to* prevent condensation).
      * Have the ability to circulate warm water through system, before opening to atmosphere (optional).

By warming components in system, the amount of water condensed on vacuum surfaces is considerably reduced.

Minimum ½ GPM at a maximum temperature of 110°F is sufficient.

* + 1. Water Supply

The most desirable water *supply* connected to KDF systems is tap water free flowing into an open drain.

*Closed loop* systems have been successfully used in *place* of tap water.

**NOTE:** When using a closed loop supply, filtration may be needed to maintain water quality as per section 1.3.2 Water Quality.

* + 1. Water Connections (Hardware)
       - *Inlet* connection - 3/4" FPT

 • Outlet connection - 3/4"FPT

Warning: Inlet pressure can reach 90psi.

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Rev A 10/07 Page 1-3

##### 600i EQUIPMENT SITE PREPARATION GUIDE

KDF0409

#### AIR SUPPLY

* 85 to 1 00PSIG (KDF provides supply line regulator).
* Filtered and dried (1SCFM intermittent).
  + 1. Air Line Connections

#### PROCESS GAS REQUIREMENTS

* + 1. Gas Specifications
       - Pressure - 25 to 40PSIG.
       - Flow Rate - 50 to 300SCCM
       - Purity - 99.999% Minimum.

Replacement: Steel tank at 600PSI and Aluminum at 100PSI. Use ¼" OD stainless steel tubing for all gases.

* + 1. Gas Lines

Each system must be supplied by a dedicated tank of gas. Each tank must be outfitted with a stainless steel, two-stage pressure regulator. All interconnecting plumbing should be stainless steel (no plastic) and have vacuum integrity.

Since the process gas lines will be periodically vacuum checked, the length and number of fittings should be minimized. A vacuum rated shutoff valve is to be installed on the system side of, and in close proximity to pressure regulator. This will make tank changing easier.

* + 1. Process Gas Line Connections
       - KDF Supplied Bulk Head Fitting - CAJON SS-4-VCR-61.
       - Customer Supplied Gas Line Fittings -
         * CAJON VCR Fitting SS-4-VCR-1 (1/4 VCR Nut-F).
         * CAJON VCR Gland Fitting 6LV-4-VCR-3S-4TB7.

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Page 1-4

### 600i EQUIPMENT SITE PREPARATION GUIDE

KDF0409

## SYSTEM VENTING GAS REQUIREMENTS

* To vent locks and process chambers, commercial grade Nitrogen, Argon or dry air can be used. Dual stage regulators should be used.

Relative humidity should be between 40 - 60%

(within a temperature range of 65°F - 75°F {18°C - 24°C}).

* Loadlock and chamber 15 - 25PSIG is recommended.
* Cryopump purging should be done with commercial grade Nitrogen or Argon. Consult *CTI* manual for more information.
  + 1. Vent Line Connections
       - KDF Supplied Bulkhead Fitting - CAJON SS-4-VCR-61.
       - Customer Supplied Gas Line Fittings -
         * CAJON VCR Fitting SS-4-VCR-1 (1/4 VCR Nut-F).
         * CAJON VCR Gland Fitting 6LV-4-VCR-3S-4T87.

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Rev A 10/07

Page 1-5

##### 600i EQUIPMENT SITE PREPARATION GUIDE

KDF0409

#### SYSTEM WORKING CLEARANCES

There will be a minimum of 4 feet (122cm) clearance on all sides of . system. This will provide safe and adequate access to all sub-assemblies. The auxiliary systems (i.e. mechanical pump, cryo compressor, etc.) will have a minimum of 3 feet (91cm) clearance on all sides and may be remotely located (maximum 10 feet {304cm}).

|  |  |
| --- | --- |
| Auxiliary Equip. (Mech. pump, Compressor) |  |
| **10 feet (304cm) maximum** | |
| KDF SYSTEM | |

Figure 1 System Working Clearances



**3 Feet (91cm) Service clearance, perimeter of system.**

**.**

**4 Fe**.**et (122cm) Service clearance**'

**eerimeter of system.**

**3 Feet (91**cm) **Operator clearance**'

**front of system.**

Caution:

**Always be aware of low working areas.**



KDF Electronic & Vacuum Services Inc.

Rev A 10/07

Page 1-6

# 600i EQUIPMENT SITE PREPARATION GUIDE

KDF0409

**1.8 600i SYSTEM LEVELING**

The system should be leveled with approximately a one-degree tilt back (for pallet handling). Use a bubble level to level the system from left to right and front to back. The four leveling pads should engage the floor and lift system (a 1-1/8" wrench will be needed).

**Warning:**

Reference KDF 600i System Layout drawing KDF2165 for the

location of the machine tie down points.

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**EARTHQUAKE ANCHORAGE LOCATION**

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KDF Electronic & Vacuum Services Inc. Rev A 10/07

Page 1-7



##### 600i EQUIPMENT SITE PREPARATION GUIDE

KDF0409

###### 1.9 KDF Remote Support

Regarding remote support for KDF sputtering equipment, it is recommended having a landline telephone and an Ethernet port in close proximity to the KDF sputtering machine. The telephone provides the customer with direct operational support and the Ethernet port provides Internet connectivity for remote support and software updates. KDF ensures a secure

Internet connection and customer authorization is required before each remote support session is started. Video and VOiP interface are also available through our WebEx site.

Security "White papers" available on request.

Notes:

* CAT 5 cable with two RJ45 connectors.

This cable plugs into the back of the computer and into the customer supplied Ethernet port.

* There are two Ethernet connections on the control system; one is to connect the HMI to the PLC and other control hardware, the second is to connect to the company's internal network for data retrieval and remote diagnostics via WebEx or Citrix (gotomypc) remote desktop software (at the customer's digression).
* The control system's internal network (i.e. HMI PLC Valve package gateways, etc.) needs to be on a separate subnet than the connection to the customer's internal network (KDF subnet is 192.168.0.xxx).
* DHCP or Fixed IP connections are ok. External networks cannot reside on the same subnet as the control system, KDF can remap to a different subnet on request.
* If the customer requires a specific computer name, it can be provided on request. The computer name should not be changed after the KDF system is installed.
* The KDF control system currently ships with Avast antivirus installed (2 year license). This license can be renewed at the end of this period or this program can be replaced at any time with site authorized and licensed antivirus software (Recommended). KDF does not recommend that the system operate without antivirus software and Firewall in place.

**NOTE: THE SYSTEM USES WINDOWS FIREWALL LOCALLY, MODIFICATIONS TO THIS ARRANGEMENT ARE NOT RECOMMENDED.**

KDF Electronic & Vacuum Services Inc. Rev A 10/07

Page 1-8

600i EQUIPMENT SITE PREPARATION GUIDE

KDF0409

Please review the system requirements outlined below and check that they comply with the KDF Site Preparation Guide. When this document is completed and faxed to KDF, we will schedule an installation date with your company's designated representative.

Please fill in/check off as required.

**Your Company Name:**

**Your Designated Representative:**

**Telephone#:**

**Fax#:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **KDF Installation Facility Requirements** | | | **Yes** *I* **No** | **Customer**  **Initial** |
| ***Electrical Requirements:***  654, 954, 643, 943, 942, 603, 903 systems require 208 VAC, 3 Phase, 4 wires, 50/60 Hertz, Phase A, B, C, Building ground, and 100  amp service.  744 systems require 208 VAC, 3 Phase, 4 wires, 50/60 Hertz, Phase A, B, C, building ground, and 225 amp service.  844 systems require 208 VAC, 3 Phase, 4 wires, 50/60 Hertz, Phase A, B, C, building ground, and 225 amp service.  Do Not Turn Power On.  Is this supplied to the system and connected to the main breaker box? | | |  |  |
| ***Water Requirements:***  643, 943, 942, 603, 903 systems require 6.5 gallons per minute supplied to the system.  654, 954, 744, 844 systems require 8.0 gallons per minute to be  supplied to the system.  Loop at back of system for this test. | | |  |  |
| Differential pressure between system inlet and outlet water connections to be a minimum of 60 psi. | | |  | - |
| Water Temperature controlled to maintain a water temperature of  between 50 and 75 Degrees F during sputter operations. (Water Temperature to be sufficiently above AMBIENT Dew Point to prevent condensation) | | |  |  |
| Is the water connected to the system (Do Not Turn Water On) | | |  | - |
| ***Air Requirements:***  85 to 100 PSIG filtered 1CFM intermittent. | | |  |  |
| ***Sputter Gas Requirements:***  Argon *I* Nitrogen *I* Oxygen inlet pressure to system of 25 to 45 psi. | | |  |  |
| Nitrogen Purge/ Vent Gas inlet pressure set to 10 to 25 psi. | | |  |  |
| All Utilities are to be CONNECTED to system and are ready to be turned on. Is this reauirement met? | | |  |  |
| Ethernet connection and telephone line installed by KDF sputtering  machine. | | |  |  |
| **Approved By:** | I | / **Date:** | |  |

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Rev A 10/07

Page 1-9