API 3000 LC/MS/MS

Site Planning Guide

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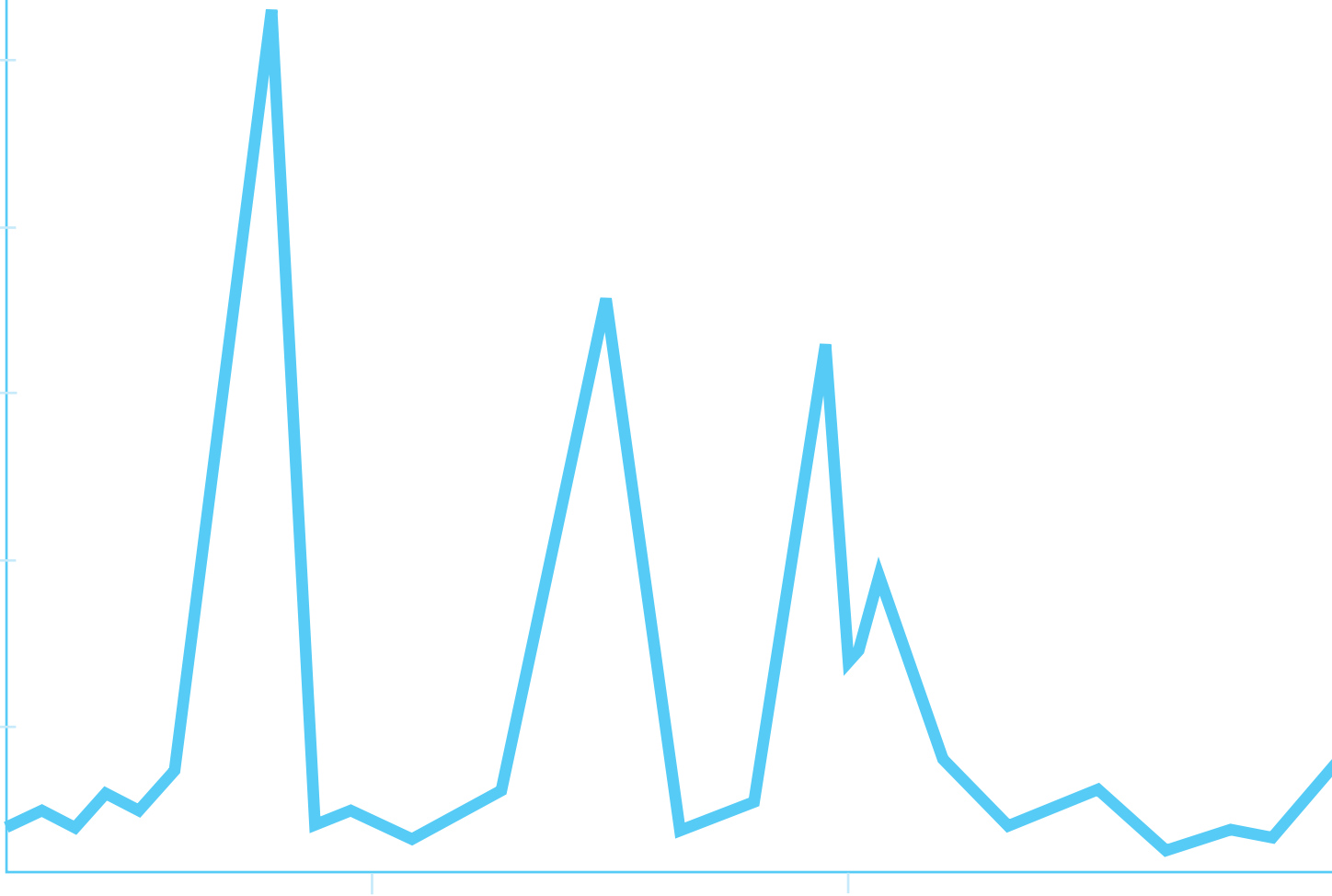

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About This Manual

This *Site Planning Guide* contains information intended to familiarize the customer with the necessary preparations and procedures for the installation of the API 3000 product and associated peripherals.

The guide contains detailed descriptions of the requirements for laboratory layout and required customer supplies. Also included is a basic description of the unpacking and assembly of the API Instrument.

Within the scope of this manual, the following conventions are used:

WARNING! Indicates an operation that may cause personal injury if precautions are not implemented.

CAUTION! Indicates an operation that may cause damage to the instrument if precautions are not implemented.

NOTE: Emphasizes significant information in a procedure or description.

International Standards

The API 3000 instrument and its components meet or exceed the requirements of the following international agencies. Applicable labels for these qualifications have been attached to various components of the instruments.

Federal Communications Commission Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The API 3000 series of LC/MS/MS instruments comply with FCC Part 15, Subpart B, Class B.

International Compliance

- EN 50082.1, EN 50093, EN 61000-3-2 and EN 61000-3-3
- Class B of CISPR publication 22 (1993)/British Standard BSI EN 55022 (1987)
- IEC 1000-4-2, IEC 1000-4-3, IEC 1000-4-4, IEC 1000-4-5, IEC 1000-4-6, IEC 1000-4-8, and IEC 1000-4-11
- Certificate of CE Compliance is included with the instrument

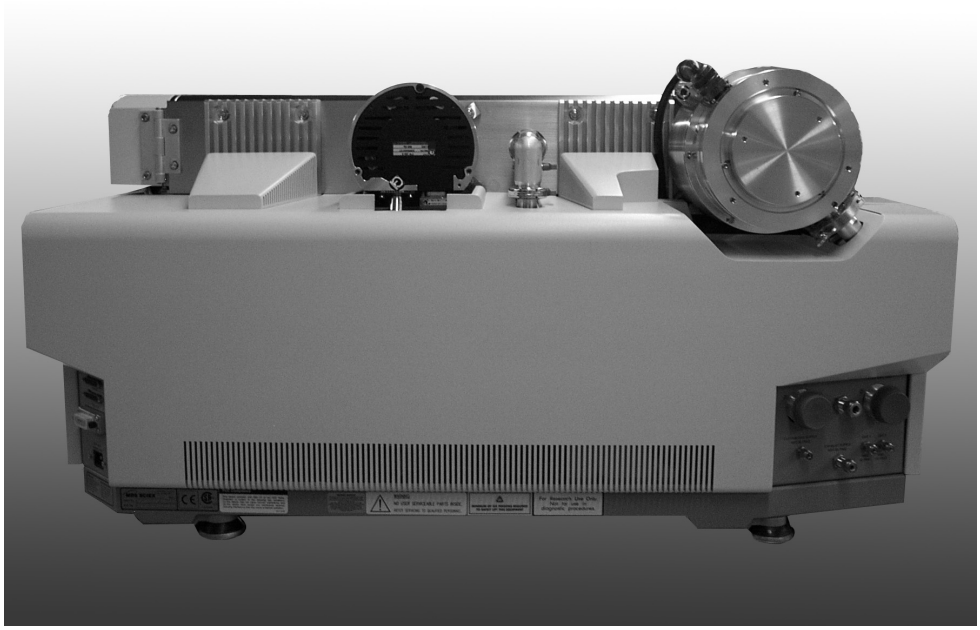
API 3000 Instrument

The API 3000 instruments, besides housing a mass spectrometer, provide connection panels for gas and pump inputs and exhaust, and electronic interfaces with the data acquisition system.

Introduction

The API 3000 series of LC/MS/MS instruments are Liquid Chromatography (LC) Mass Spectrometers (MS), which incorporate an Atmospheric Pressure Ionization (API) Ion Source.

API 3000 Mass Spectrometer - Front View

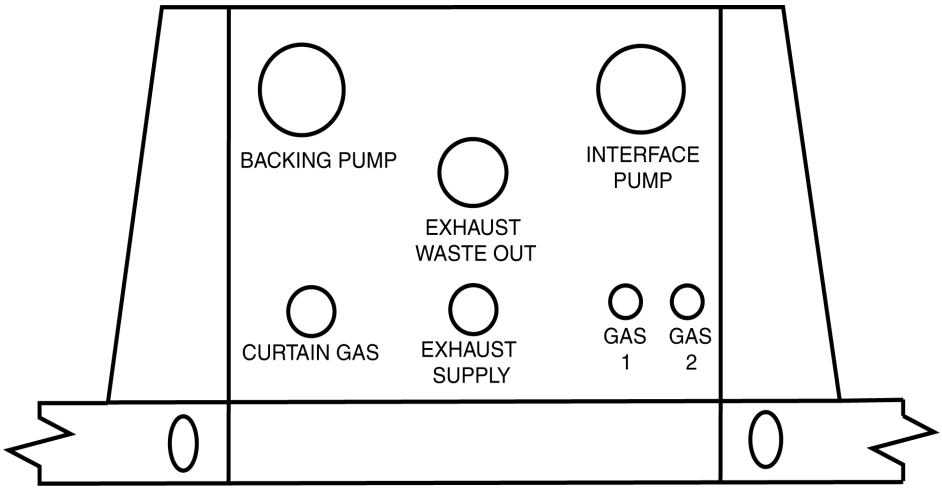


API 3000 Mass Spectrometer - Rear View

Connections

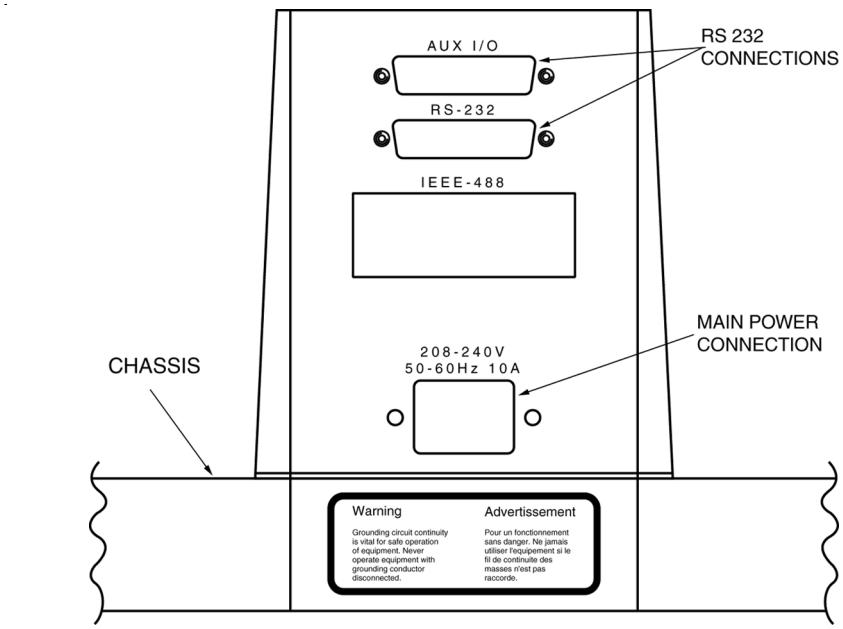
Connections to the instrument are located on the two rear bulkheads, which are positioned on the rear corners of the instrument mass spectrometer.

The gas connection panel is located on the right side at the rear of the instrument (closest to the ion source).



Gas Connection Panel for API 3000 Instruments

The other bulkhead contains the connections for the main power connection (207 VAC to 242 VAC at 50/60 Hz), applications computer interface, and both an auxiliary I/O port and RS-232 interface.



API 3000 Interface Connection Panel

Site Responsibilities Outline

Items the customer must supply for site set up are:

1. Four separately regulated gas lines with shut off valves and fittings set up to the specifications outlined.
2. Within North America: Two 15 amp circuits at 207 to 242 VAC with two NEMA 6-15R receptacles each (4 total) located no more than 1.8 meters (6 ft) from the bench. Plugs for these receptacles must be provided by the customer and will be installed on the applicable power cords by the service representative during installation. See the *Electrical Requirements* section for details.
   Outside of North America: Two 15 amp circuits at 207 to 242 VAC with two suitable receptacles each (4 total) located no more than 1.8 meters (6 ft) from the bench. The customer must provide applicable mating plugs for each receptacle.
3. A moveable bench for the API system or a fixed bench with 1 m (3.3') of rear clearance and sufficient space underneath for the mechanical roughing pump. See *Suggested Room Layout* section for details.
4. A bench for the computer equipment located within 3 m (10') of the mass spectrometer. See *Suggested Room Layout* section for details.
5. Two positive flow vents with a 3.2 cm (1.25") OD smooth fittings located within 1.5 m (5') of the roughing pump outlets or two mist filters. See *Exhaust Requirements* section for details.
6. One positive flow vent with a 1.27 cm (0.5") OD barbed fitting and sufficient 1.27 cm (0.5") ID silicone tubing to connect the vent to the supplied source exhaust bottle.
7. Nitrogen gas and/or Zero Air at the pressures, quantities and qualities specified in the *Gas Requirements* table.

8. One (1) liter quantities of HPLC or MS grade methanol, acetonitrile and water.
9. Tubing fittings required to connect any LC equipment to the API **unless** the equipment was sold by Applied Biosystems or was part of an Applied Biosystems designed and sold workstation.

NOTE: Extra Charges **will** apply if the site is not set up to specification or extra parts are required.

Customer Service Representative Responsibilities

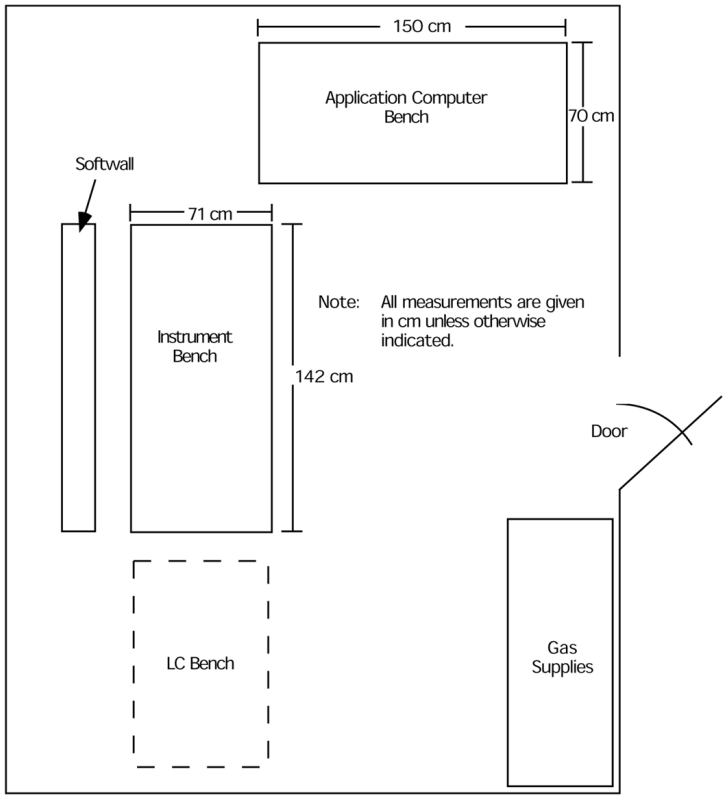
The Customer Service Representative for site set up and installation will:

1. Supply all fittings, plugs, tubing and cables required to connect the API system to the lab vents, electrical receptacles and regulators, provided they are within the maximum distances specified in this site guide.
2. Test and qualify the API system to the specifications in the Installation Test Documents.
3. Assemble and set up any benches ordered with the instrument.
4. **Will not** supply regulators, shut off valves, electrical receptacles solvents or gases.
5. **Will not** supply LC fittings or tubing except as described in item 9 above.
6. **Will only** set up Applied Biosystems supplied and manufactured LC equipment.
7. **Will only** connect up and ensure RS-232 communications with peripheral devices unless it is a part of a workstation.

System Requirements

Suggested Room Layout

While the recommendations for room layout are flexible, the recommendations regarding operating conditions should be followed as closely as possible to ensure proper and safe equipment operation.



The Instrument bench requires a minimum size of 71 cm x 142 cm.
The Application Computer Bench dimentions are determined by the bench manufacturer but recommended dimentions are given as 70 cm x 150 cm.
If desired the gas supplies could be located external to the laboratory.

Suggested Room Layout-Top View

Room Dimensions

The customer must provide the customer service representative with adequate access to the instrument. Provisions for clearance of approximately 1 m. (3.3 ft.) to any one side of the unit, as necessary, should be made at the time of service.

NOTE: The custom bench option is the recommended bench. Use of wall-mounted, fixed benches will require custom installation.

For purposes of sound proofing, it is highly recommended that a soft wall be located behind the instrument.

Operating Environment

The site environment should be kept clean and generally dust-free. High standards of cleanliness are expected.

Mass Spectrometer

To ensure the proper operating conditions for the instrument, the environmental conditions must be maintained within ±2 °C in the range of 15 to 30 °C (59 to 86 °F) with a relative humidity of between 20 and 80% non-condensing. Operation of the instrument above 2000 meters (6500 ft.) above sea level is not recommended.

The Basic API system air conditioning requirements are 1800 W (6150 Btu/h) for the mass spectrometer and roughing pump.

The TurboIonSpray or Heated Nebulizer will add an additional heat load of 500 W (1700 Btu/h).

Roughing Pump

To ensure proper operation of the roughing pump, the ambient temperature must be maintained between 15 and 30 °C (59 to 86 °F), with a relative humidity of 20 to 80% non-condensing.

NOTE: It is important that the roughing pump not be put in an enclosed area without cooling fans. Without proper ventilation, they will fail prematurely or shut down from overheating.

Electrical Requirements

It is recommended that two separate 207 to 242 VAC, 15 amp grounded, single phase circuits with two receptacles each be used to supply the power requirements for the following items:

- API mass spectrometer
- Roughing Pump
- National Instruments GPIB Box (if supplied)

In North America use 6-15R receptacles and 6-15P plugs; if outside of North America, use local standards. Each circuit must have two receptacles. Receptacles and their applicable plugs must be provided by the customer. If local voltages are outside the instrument specifications of 207 to 242 VAC, the Line Adjustment Transformer option (WC014179) must be used. If the line voltage fluctuates by more than 5% during a 24 hour period and falls out of specified values, a power conditioner may be needed.

If supplied, the GPIB Box from National Instruments comes configured from the factory for 220 VAC operation. For use with 110 VAC, it is necessary to reconfigure the internal dip switches and replace the GPIB box fuse.

A minimum of three electrical outlets will be required for the computer equipment. If the PE Series 200 pump, Autosampler, UV detector and Nelson NCL 902 or equivalents are purchased, four 117 V grounded outlets will be required. Other outlets will be required for LC pumps, autosamplers, analog digital converter (ADC) boxes and ultraviolet (UV) detectors. Please consult the respective manufacturer’s documentation for specifications.

NOTE: Powerline conditioners are not recommended or specified. See *Appendix A* for a discussion of power conditioner requirements.

Power Consumption

The API 3000 instrument, including the roughing pump, requires a nominal 220 VAC (207 to 242 VAC) at 13 to 15 amps. This includes:

- The API mass spectrometer requiring 220 VAC at 6 amps
- The roughing pump requiring 220 VAC at 2.4 to 4.5 amps

Gas Requirements

The API 3000 instruments require several types of input gas. The purity and pressures should be adhered to for proper operation of the instrument.

NOTE: The stated gas purities are given as required at the instrument.

Curtain Gas and CAD Gas

UHP (99.999%) nitrogen (or an approved nitrogen gas generator with impurities that are known not to negatively impact performance) at 60 psig at flows up to 3.5 L/min is required for the gas. The CAD gas does not require a separate inlet connection, it is internally tapped off the Curtain Gas.

Gas 1

Zero air or UHP (99.999%) nitrogen (or an approved nitrogen gas generator with impurities that are known not to negatively impact performance), at 90 psig with flows up to 4.0 L/min is required. Gas 1 is the nebulizer gas for IonSpray and TurboIonSpray and the auxiliary gas for the Heated Nebulizer source.

Gas 2

Zero air or UHP (99.999%) nitrogen (or an approved nitrogen gas generator with impurities that are known not to negatively impact performance), at 90 psig with flows up to 8.0 L/min. Gas 2 is the heater gas for TurboIonSpray and the nebulizer gas for the Heated Nebulizer source.

Source Exhaust Gas

Clean, dry and oil free air at 50 psig with flows up to 8.0 L/min.

Gas Requirements

Component	Gas	Delivery psig	Gas Purity	Flow
Curtain and CAD Gas	UHP N_2	60 psig	UHP N_2 (99.999%)*	3.5 L/min max.
Ion Spray Nebulizer TurboIonSpray Neb. Heated Nebulizer Aux. (Gas 1)	Air or N_2	90 psig	Air or N_2 (99.999%)*	4.0 L/min max.

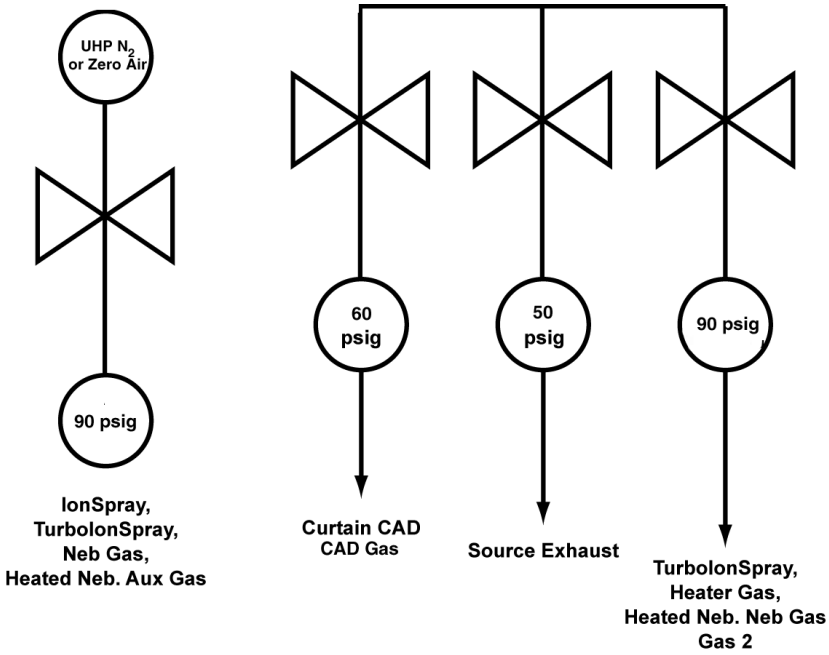
Gas Requirements

Component	Gas	Delivery psig	Gas Purity	Flow
TurboIonSpray Heater Heated Nebulizer Neb. (Gas 2)	Air or N_2	90 psig	Air or N_2 (99.999%)*	8.0 L/min max.
Source Exhaust **	Clean, dry oil- free air	50 psig	Clean, dry oil- free air	8.0 L/min max.

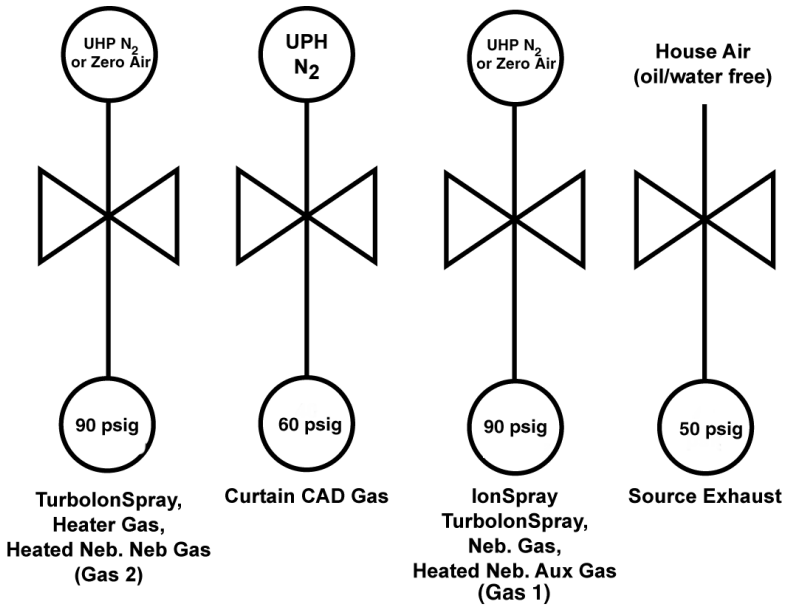
* or approved nitrogen gas generators with impurities known not to negatively impact performance

** air is more economical than nitrogen

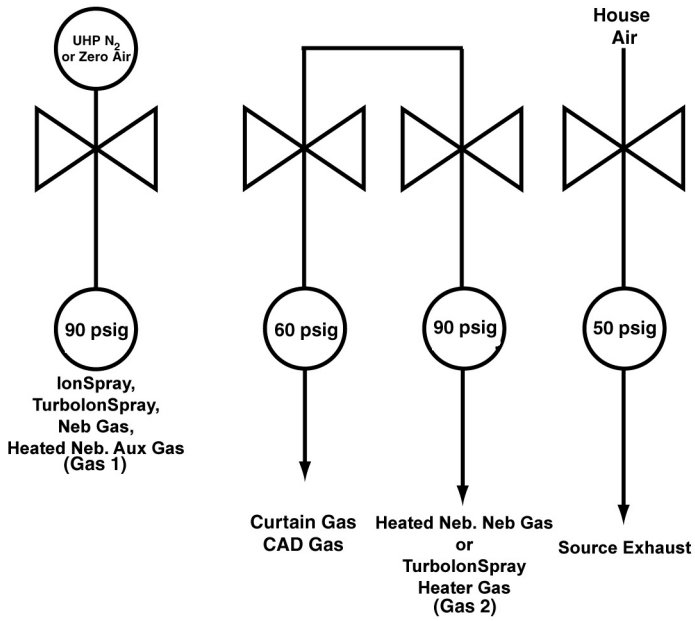
Suggested Gas Configurations



Gas Connection Schematic Using Separate Air



Gas Connection Schematic Using Cylinders



Gas Connection Schematic Using Separate Air and House Air

CAUTION! The operation of API 3000 instruments requires that if house gases are being supplied, each supply must be separately regulated at the instrument.

The preferred method for gas line connections are compression fittings. Liquid pipe sealant is not acceptable for gas line connections. If threaded fittings must be used, only teflon tape is acceptable for sealing the threads. Soldered fittings are not acceptable unless the tubing is thoroughly cleaned.

Exhaust Requirements

Exhaust from the API 3000 instrument originates from the source exhaust and roughing pump.

Source Exhaust Pump

During operation solvent vapors are exhausted from the ion source by the source exhaust pump to a 1.27 cm (0.50 in.) barbed fitting at the rear of the instrument. These vapors pass through a trap, which must then be vented to a fume hood or outside port. The diameter of the trap exhaust port is 1.27 cm (0.50 in.). It is the responsibility of the customer to provide the proper plumbing from this trap to the ventilation point.

Roughing Pump Exhaust

The customer has the option of purchasing the installation kit which includes smoke eliminators (mist filters) for the roughing pump. The system includes fittings and tubing to connect the roughing pump to the fume hood or other vents.

Computer Communications Cable Layout Requirements

The system will come with a GPIB box or a GPIB card installed in the computer. The recommended maximum distance between the API mass spectrometer and the GPIB box or data acquisition system is 4 m (13 ft). Distances longer than 4 m (13 ft) may be used, but reliable IEEE 488 communication cannot be guaranteed.

The SCSI communications cable length is 0.5 m (18 in.) and requires that the GPIB box (if supplied) be located next to the data acquisition system.

Weights and Dimensions

The API mass spectrometer is 50 cm (20 in.) deep by 130 cm (53 in.) long by 52 cm (21.5 in.) high. This instrument weighs approximately 147 kg (323 lbs), excluding the roughing pump and the transformer.

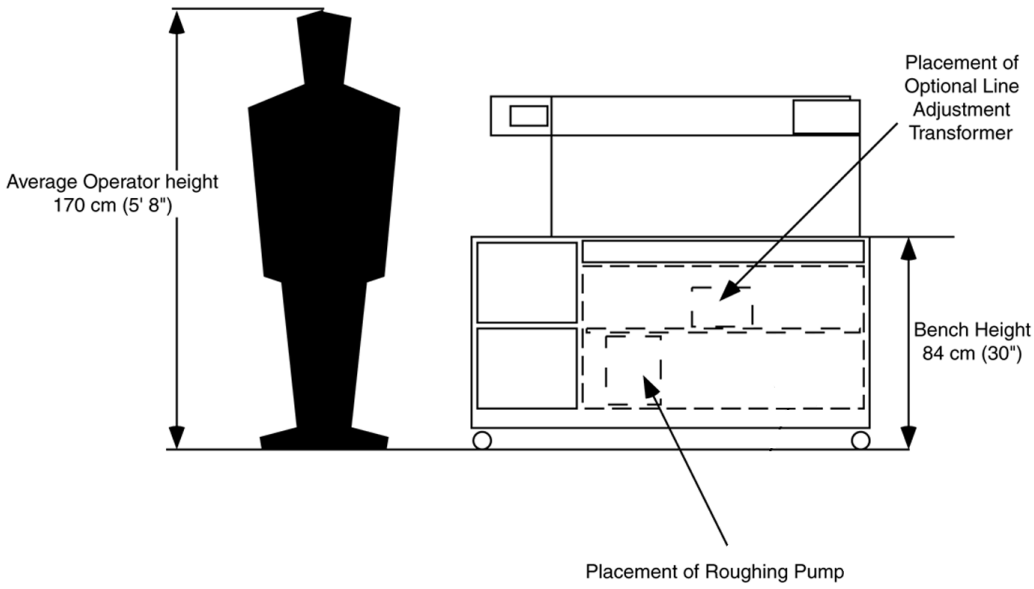
The customer should supply a bench capable of supporting a minimum weight of 242 kg (529 lbs). The minimum suggested bench is 75 cm (30 in.) wide by 150 cm (60 in.) long, and 75 cm (30 in.) high. In addition, the bench should have wheels for optimum operation and service access. The optional API custom bench is the recommended bench.

Each roughing pump weighs as much as 40 kg (88 lbs) and is as large as 30 cm (12 in.) high by 25 cm (10 in.) wide, by 58 cm (23 in.) long. If either mist eliminator is used (Varian or Leybold), it will add 25 cm (10 in.) to the height. The pump should be located underneath the API instrument on the mounting/damping plates included with the special bench, but may be positioned within 1.5 m (5 ft) of the unit.

NOTE: The API may be shipped with various models of roughing pump. The differences are as follows:

- Weights and dimensions as shown in this document may vary by pump model.
- Mounting/damping plates are universal to all pump but certain models require specific clamps to hold them in place on the plates.
- Operating amperages are similar.
- Input and output type KF25 fitting sizes are identical for all models.

The transformer weighs approximately 15kg (33 lbs) and is 15.5 cm (6.5 in.) high by 20 cm (8.2 in.) wide by 27.5 cm (11.5 in.) long. The transformer should be located behind the instrument bench, or in between the roughing pump.



Suggested Bench Height

Application Computer System Requirements

Data acquisition for Analyst has been tested with specific computer models only. It is recommended that you order the computer system and the data acquisition cards through the instrument supplier.

The computer system requirements may be updated from time to time. Please contact your service representative for current system requirements.

Establishing EtherNet network connections and assigning a unique TCP/IP address to the Applications Computer must be handled by the customer. The Customer Service Representative will provide you with the information required to connect the API 3000 instrument to the applications computer. You will need to contact your systems administrator for the proper TCP/IP address and any required network connection hardware.

NOTE: To ensure reliable IEEE 488 communications between the applications computer and the API mass spectrometer, the GPIB cable length is limited to 4 m (13 ft).

Recommended Supplies

In the suggested room layout, the LC pumps and autosamplers require a movable bench for access to the Ion Spray, Heated Nebulizer, or TurboIonSpray.

The Computer equipment may be placed on a fixed bench, provided that access to the API instrument is not restricted.

The bench space requirements for the pumps, computers, etc. is dependent on the respective manufacturer.

Useful Part Numbers and Suppliers

The following is a list of part numbers for third-party supplied products and their manufacturers. See the tables below.

Gas Regulators

Use		Regulators	Manufacturer	Cylinder/Dewar Part No.	House Gas Part No.
Curtain Gas		N_2 - 60 psig	Matheson (100 psi max)	SP-3810-580 (1/8” fitting)	SP-3231 (1/8” fitting)
Gas 1	Ion Spray	Air or N_2 40 psig	Matheson (100 psi max)	SP-3810-590 (1/8” fitting)	SP-3231 (1/8” fitting)
	TurboIonSpray	Air or N_2 90 psig			
	Heated Nebulizer	Air or N_2 40 psig			

Gas Regulators

Use		Regulators	Manufacturer	Cylinder/Dewar Part No.	House Gas Part No.
Gas 2	Heated Nebulizer	Air or N_2 100 psig	Matheson (100 psi max)	SP-3810-580 (1/8" fitting)	SP-3231 (1/8" fitting)
	TurboIonSpray	Air or N_2 40 psig			
Source Exhaust		Air - 50 psig	Matheson (100 psi max)	SP-3810-590 (1/4" fitting)	SP-3231 (1/4" fitting)

The Source Exhaust pump regulator fitting is a 1/4" NPT to 1/4" Swagelok fitting (Swagelok P/N SS-400-11-4). Porting for the remaining regulators are 1/4" NPT fittings (Female). 1/4" NPT to 1/8" Swagelok fittings are required for the regulator outputs. The appropriate fitting is Swagelok P/N SS-200-11-4.

Roughing Pump Exhaust Supplies

Use	Vacuum System Fittings	Manufacturer	Part No.
Roughing Pump Exhaust Filter	Smoke Eliminator (optional)	Leybold	WC030659 (AB p/n)
Roughing Pump Exhaust Filter with Oil Return	Smoke Eliminator (optional)	Varian	027583 (SCIEX p/n)
Roughing Pump Exhaust Hose	As required (two 5 ft. lengths supplied)	--	WC015516 (AB p/n)
Vacuum Hose Fitting	Two required, 32 mm (supplied with system)	SCIEX	WC007962 (AB p/n)
Screw Type Clamp	Eight required (supplied with system)	TRIDON HS-24	WC000249 (AB p/n)
Roughing Pump Exhaust Hose Fitting	Two required per pump (supplied with system)	--	WC015518 (AB p/n)

NOTE: Two 5 ft. lengths of exhaust gas hose and fittings are supplied with the system. Exhaust lines greater than five feet will require extra tubing and fittings. See table above for part numbers.

Customer Supplied Equipment and Materials

The customer is responsible for providing the following supplies while operating the API 3000 instruments.

Solvents

The customer supplies methanol, acetonitrile, and water (all HPLC grade).

Gases

The customer will supply the following gases:

- UHP nitrogen at 60 psig up to 3.5 L/min for curtain gas, and CAD gas
- Zero air or UHP nitrogen at 90 psig up to 4 L/min for Gas1
- Zero air or UHP nitrogen at 90 psig up to 8 L/min for Gas 2
- House Air at 50 psig, up to 8 L/min, oil free for source exhaust or pump nitrogen

WARNING! Use qualified personnel for the installation of plumbing and fixtures, and ensure that all installations follow local bylaws and biohazardous regulations.

Electrical

The customer will supply the following electrical connections:

- Two grounded 207 to 242 VAC, single phase, 15 amp circuits with 2 NEMA 6-15R receptacles and plugs per line for the API instrument and other instrument accessories (GPIB and roughing pump).

  NOTE: The Line Transformer Option (WC014179) is the recommended means of supplying the required voltage if the 207 to 242 VAC specification cannot be met.
  Powerline conditioners are not recommended or specified. See *Appendix A* for a discussion of power conditioner requirements.

- Sufficient outlets for autosamplers, LC pumps, and other computer equipment. See manufacturer's specifications for voltage, current, and other requirements.

WARNING! Use qualified personnel for the installation of all electrical fixtures, and ensure that all installations follow local bylaws.

Regulators

Customers must supply the appropriate gas regulators for the gas supplies. The gas regulators required for gas cylinders/dewars or house gases are listed in the *Gas Regulators* table.

Ventilation

The customer must supply ventilation as required by local bylaws and regulations for the roughing pump and the source exhaust pump. The maximum flow of these pumps is a volume of less than 8 L/min.

NOTE: For installations where the optional installation kit has been purchased, (WC014543) venting of the roughing pump is not necessary as smoke eliminators have been included.

WARNING! Use qualified personnel for the installation of plumbing and fixtures, and ensure that all installations follow local bylaws and biohazardous regulations.

WARNING! It is strongly recommended that the source exhaust system be used and that the exhaust is safely removed from the laboratory environment.

Appendix A - Line Voltage Conditioning

Introduction

Line voltage requirements for the LC/MS equipment are defined in the documentation. These requirements are not stringent and can normally be met by the local electrical supply authority.

Policy

Where the electric supply does not meet supplied requirements, it is recommended that the customer should consult their power supplier or a local consultant on line conditioning apparatus to establish the most effective solution to the problem. See *Appendix B* for specifications.

Line Input Circuits

Transients

The API 3000 Instrument has line filter circuits that should eliminate the effects of brief transients. The API 3000 Instrument is tested to IEC 1000-4.

Regulation

The electronics in this equipment operate from regulated power supplies which are not frequency sensitive. The required line voltage regulation is specified in the documentation. See *Appendix B* for specifications.

Supply Interruption

An Uninterruptable Power Supply unit (UPS) is required to ensure continuous operation of the instrument in the event of a power supply interruption. A UPS normally includes a battery, a battery charger and an AC to DC inverter which can be both large and expensive. Normally, they are sized to run the instrument for approximately 10 minutes following a power failure, allowing an orderly termination of the work in progress. This type of equipment often includes control of line voltage regulation and additional transient protection.

Appendix B - Summary of Statistics

The following table provides statistics for the API 3000 series of instrument systems.

Electrical Requirements	
Two separate grounded 207 to 242 VAC, 15 amp, single phase circuits for the following items: API mass spectrometer Roughing Pump National instruments GPIB Box	
Gas Requirements	
Source Exhaust Pump	Air gas supply (free from pump oil) at a flow rate up to 8 L/min at 50 psig.
Curtain Gas/CAD Gas	UHP (99.999%) nitrogen (or an approved nitrogen gas generator with impurities known not to negatively impact performance) at a flow rate up to 3.5 L/min at 60 psig.
Gas 1	Zero air or UHP (99.999%) nitrogen (or an approved nitrogen gas generator with impurities known not to negatively impact performance). Delivery pressure is up to 90 psig with flow rates up to 4 L/min.
Gas 2	Zero air or UHP (99.999%) nitrogen (or an approved nitrogen gas generator with impurities known not to negatively impact performance), at a delivery pressure of up to 90 psig and a flow rate up to 8 L/min.
Exhaust Requirements	
Source Exhaust Pump	During operation the vapors are exhausted from the ion source by the pump to a 1.27 cm O.D. (0.5 in) barbed fitting at the rear of the instrument.
Roughing Pump Exhaust	Hose and fittings are included, but you also have the choice of purchasing the installation kit which includes smoke eliminators for the roughing pump. If you vent the pump exhaust to a fume hood, or an outside source, the vent fitting size should be 3.21 cm (1.25 in.).
Communication Cable Layout Requirements	
Recommended maximum distance between the API instrument mass spectrometer and the GPIB box is 4 m (13 ft). Distances longer than 4 m can be used, but reliable IEEE 488 communication cannot be guaranteed.	
SCSI communication cable length is 0.5 m (18 in.), and requires that the GPIB box (if supplied) is located next to the applications computer.	

Weight and Dimensions	
API 3000 Instrument	50 cm (20 in.) deep by 130 cm (53 in.) long by 52 cm (21.5 in.) high.
	Approximately 147 kg (323 lbs).
Bench	Minimum suggested bench is 75 cm (30 in.) wide by 150 cm (60 in.) long, and 75 cm (30 in.) high. There should be optimum operation and service access.
Roughing Pump	Each roughing pump weighs approximately 40 kg (88 lbs).
	Each roughing pump is as large as 30 cm (12 in.) high, by 25 cm (10 in.) wide, by 58 cm (23 in.) long. If either mist eliminator (Varian or Leybold) is used, it will add 25 cm (10 in.) to the height.
	The pump should be located underneath the instrument on the mounting/damping plates and should be positioned within 1.5 m (5 ft) of the unit.
Transformer	Weighs approximately 15 kg (33 lbs).
	15.5 cm (6.5 in.) high by 20 cm (8.2 in.) wide by 27.5 cm (11.5 in.) long.
	The autotransformer should be located behind the instrument or on a special bench shelf.

Appendix C - Customer Site Setup Check-off List

Customer _____

SPO # _____

CSE Name/# _____

Date _____

Customer Site Setup Check-off List

Requirement	OK	Pre-installation Action Required
Lab Space Requirements		
Gas Requirements:		
Gas 1 - Zero grade air, delivery pressure to 90 psig, flow to 4 L/min.		
Gas 2 - Zero grade air, delivery pressure to 90 psig, flow up to 8 L/min.		
Oil free at 50 psig, 8 L/min maximum gas supply (air or N_2) for the source exhaust pump		
UHP (99.999 %) N_2 (or an approved nitrogen gas generator with impurities known not to negatively impact performance) for the curtain and CAD gases at 60 psig, up to 3.5 L/min.		
Environmental Requirements		
API 3000 Mass Spectrometer Ambient temperature of 15 °C to 30 °C (stable within ± 2 °C) and relative humidity 20 to 80%, non-condensing.		
Roughing Pump Ambient temperature of 15 °C to 30 °C (stable within ± 2 °C) and relative humidity 20 to 80%, non-condensing.		
Safety Requirements		
Gas Cylinders Mounted to meet local safety standards		
Gas Delivery Lines As required by local safety standards		
Ventilation Vent to remove effluent from plenum chamber exhaust pump		

Customer Site Setup Check-off List

Preparation of Samples		
Test Samples ABD P/N 401936 received and refrigerated		
Power Requirements		
Two separate 207 to 242 VAC, 15 amp, single phase circuits for the following items: API mass spectrometer Roughing Pump National instruments GPIB Box		

Comments

The following sign-off is an acknowledgment that the Site Planning Guide has been read and that the site has been prepared and set up according to specifications contained within this document and with the limitations noted.

Customer_____ Title_____ Date_____