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TA Instruments Installation Requirements for Q Series Thermal Analysis Systems

Notice

Thank you for ordering a Q Series thermal analysis system from TA Instruments. To ensure that installation of your system goes as smoothly as possible and has you ready to start evaluating your sample materials as quickly as possible, we are providing the attached installation information. It includes details regarding laboratory space, power, and auxiliary requirements, as well as configuration requirements for the controller (computer). Please review this information carefully and take any appropriate actions prior to the installation date. To avoid unnecessary delays, and/or additional charges, please ensure that the requirements specified in this document are met before your TA Instruments Service Representative arrives. Contact your local TA Instruments Representative if you have any questions.



To arrange for installation of your system, contact our U.S. Service Department (302-427-4050) or your local TA Instruments Service Representative.

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Important: TA Instruments Manual Supplement

Please refer to the *TA Manual Supplement* to access the following important information supplemental to this document:

- TA Instruments Trademarks
- TA Instruments Patents
- Other Trademarks
- TA Instruments End-User License Agreement
- TA Instruments Offices

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Requirements for the Controller (Computer)

A working thermal analysis system consists of one or more measurement instruments (e.g., DSC, TGA) and a computer configured with appropriate TA Instruments software (this latter combination is subsequently referred to as a controller). As a customer, you have two alternatives for configuring a controller. You can either purchase a computer and have it configured by a TA Instruments Service representative or you can purchase a suitable computer on your own and configure it at your site. In either case, the general requirements which follow are the same.



In situations where you are supplying the computer, it is assumed that you have reviewed these requirements and suitably prepared the controller prior to the scheduled system installation by the TA Instruments Service Representative. In fact, you will be required to provide hardcopy verification of your system setup using the instructions on page 8 before an installation visit will be scheduled.

Before installing the TA Instruments software, you should ensure that the computer system meets the following specifications:

Description	Requirement
Operating system[1]	Supported Operating Systems:32 & 64-bit versions of Windows Vista Business and Ultimate and Windows 7 and Windows 10 Ultimate, Enterprise & Professional[2]
Processor	Intel® l Core™ 2 Duo (2.93 GHz with 3 MB L2 cache) or better
Memory	≥4 GB RAM
Hard drive	≥80 GB free on hard drive
CD-ROM	≥48X CD-ROM or DVD
Screen resolution	1024 x 768 with ≥64K colors
Graphic memory	128 MB
Screen (LCD) size	19” or greater (24” wide screen recommended)

1. Install Microsoft Operating System Service Pack, Internet Explorer and/or Direct X (if required). If you don't have the required versions of these packages, they can be obtained through the Microsoft web site (at www.microsoft.com/downloads) or by using the Microsoft Windows Update mechanism (accessed through the Start menu or by accessing http://update.microsoft.com).
2. Home version of Windows 7 and/or Vista is not acceptable. Home version is missing certain functionality that is needed for optimized analyzer performance and efficiency.



The following Microsoft components are automatically installed as part of Advantage V4.7 or higher: MS.NET Framework 2.0 and Microsoft Visual C++ 2005. These components support the latest software development tools used in Advantage V4.8, as a result software installation may take longer than in previous versions.

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Additional Requirements for Thermal Advantage Q Series™

Description	Requirements
Network card	10/100TX PCI Ethernet NIC for Advantage Q-Series™.
Ethernet hub/Switch ethernet cabling	10/100BaseTX Ethernet hub/switch for Advantage Q-Series™. Must be EIA-568B Category 5 UTP.
TCP/IP ports	Network Services, as well as File & Printer Sharing for Microsoft Networks, Client for Microsoft Network, and Internet Protocol (TCP/IP).



User Account Control (UAC) must be disabled for Windows to locate and connect to instruments through explorer.

Additional Requirements for Universal Analysis

Description	Requirements
Support for custom reporting feature of data analysis	Microsoft Word® 97 or higher, Microsoft Excel® 97 or higher, and Adobe Acrobat Reader (provided with Advantage) are also required.
Color scheme	For Vista, Windows Aero is required (other schemes may result in broken line display)

Additional Requirements for Instrument Control Software

Description	Requirements
User log-in capability	While multiple users may still use the "Fast User Switching" function when running Windows Vista, only one user at a time may use the TA Instruments Q Series™, Thermal, or Rheology Advantage Instrument Control software. This limit, which is applicable to most programs, is a result of hardware resources that are used by each of these programs.

Additional Requirements for TA Update*

Description	Requirements
Connectivity	Controller computer must be able to connect to the Internet.[1]
Log-in rights	Administrator

1. TA Update allows for online software updates. The entry of a user name and password is allowed in cases where proxy or firewall authentication is required.

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Additional Requirements for VTI-SA/SA+

Description	Requirements
Available PCI slot (1/2 height size)	For VTI-SA+ camera option only
Software requirements:	Microsoft Excel® 2007 or newer with Solver Add In, English version (not supplied)

Free Disk Space Required

To help you determine which components to install, we have provided the following table containing the approximate amount of free disk space required for installation of the TA Advantage software.



This amount is above that required for the operating system, plus the other software products supplied on the installation CD-ROM. In addition, an extra 15 MB of free disk space is required during the install process (for temporary install files.)

Software	Thermal Only	Data Analysis Only (Thermal)	Rheology Only	Full Installation
Q Series™	684 MB	29 MB	344 MB	1057 MB

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Other Hardware Considerations

- The computer should be a new computer that is not already attached to other analytical instruments.
- Before the TA Instruments Service Representative will schedule a visit to install new instruments, please obtain a hard copy of the Windows® system summary as instructed below to verify that your system is adequate. Please fax this verification sheet along with your company identification and phone number to TA Instruments Service at 302-427-4054.

Obtaining Hardcopy System Verification For Windows

1 Select **Programs** > **Accessories** > **System Tools** > **System Information** from the **Start** menu.

2 Verify **System Summary** is highlighted.



If you print out this summary from this step you will receive all system information (more than 50 pages). Follow the remaining steps to copy and print only summary information.

3 Select **Edit** > **Select All** then **Edit** > **Copy**.

4 Open Notepad or another word processing program.

5 Select **Edit** > **Paste** then **File** > **Print**.

Other Software Considerations

- Peripherals (e.g., printer) must be from the known Windows compatible list. (See Microsoft's web site at http://www.microsoft.com/hwtest for the most current list.)
- TA Instruments is not responsible for resolving issues associated with connections to your corporate network. [See further information in the next section.]
- TA Instruments is not responsible for resolving hardware/software conflicts created by the addition of third party hardware or software to the computer.

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System Configurations

TA Instruments Q Series™ thermal analysis instruments communicate with the controller via TCP/IP. Each TA Instruments controller requires an Ethernet hub/switch for configuring a local network (i.e., controller, instrument(s), printer).

If you want to connect a thermal analysis controller with Q Series instruments to your in-house network, additional considerations will apply. Review the scenarios shown below for the one that applies to your situation.

- Controller Purchased from TA Instruments

  If you wish to have your TA controller connected to your company network, you must supply a second network interface card. The controller and Q Series instruments are shipped with pre-assigned (static) "TA Instruments-compatible" IP addresses. Your MIS/IT department must supply and configure a second Ethernet card for communication with your in-house network. Your TA Instruments serviceman can install this second card during start-up of the system. Note: Using this configuration, you can archive data to another computer on the network or print results on a network printer.



Using this configuration, you can archive data to another computer on the network or print results on a network printer

- Software Suite Purchased from TA Instruments

  If you wish to have your TA controller connected to your company network you must supply two network interface cards. Your MIS/IT department should configure one of the Ethernet cards in the computer that you are supplying for communication with your in-house network and must supply and install a second card to be used with the TA Q Series instruments. Your TA Instruments service representative will configure the second Ethernet card during start-up of the system to communicate with the Q Series instruments.



Using this configuration, you can archive data to another computer on the network or print results on a network printer

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Requirements for an Advantage Integrity™ System (Applicable to Q Series™ Thermal Instruments Only)

An Advantage Integrity system consists of an instrument, a computer for instrument control, and a database server. To obtain installation requirements for the instrument and controller computer, refer to the appropriate sections of this document. The Advantage Integrity systems rely on an Oracle® database installed on a separate database server. This server can operate with the instrument and controller computer as part of a LAN or it can reside on a network. The database server and Oracle software can be purchased from TA Instruments or the customer can supply the server based on the requirements below. Contact TA Instruments Service at 302-427-4050 (U.S.) or your local TA Instruments office for additional information required for the installation of Advantage Integrity systems.

Database Server Requirements

The following are the requirements for the Advantage Integrity database system:

- Minimum **Hardware** Specifications:
  - Intel® Core 2 Duo E4600 2.4 GHz Processor
  - 2 GB memory
  - 250 GB hard drive
  - Super Multi DVD±RW (±R DL) drive
  - 10/100TX PCI Ethernet NIC network card
- Oracle database software with the appropriate number of named user licenses. Global database name and SID must be set to TAInstDB. Unicode character set must be used (AL32UTF8 or UTF8).
- **Oracle 12c Release 1: Windows® Server 2012 or Windows Server 2008**
  [English language version with English (US) regional settings].

  Oracle 11g Release 1 or Release 2: Windows Server 2003 or **Windows Server 2008**
  [English language version with English (US) regional settings].
- The **Database Server** must be dedicated to the TA Instruments system and not be used as a server for other databases or any other type of servers such as file server, print server, etc.
- The host name must not be changed after Oracle is installed on the server.
- Available compatible **tape drive** or **DVD+RW drive** for database backup.
- Prior to the installation visit, the customer must install the Oracle database server on their company network (if a networked configuration is desired) and ensure that the computer is visible on network. Network connection must be available in the location where the TA controller will be installed prior to installation. TA Field Service Representative must have access to the appropriate MIS/IT personnel during installation to resolve any networking issues.
- Service installation should not be scheduled until the database server is connected and visible on you company network. Verification of setup will be required. If you are supplying your own controller,

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then it too must be connected and visible on your company network following the network addressing described in the Oracle Server Installation Instructions (P/N 925007.000).

- Any needed Static IP addresses should be obtained from your IT department and taken out of the company's list of assignable addresses.

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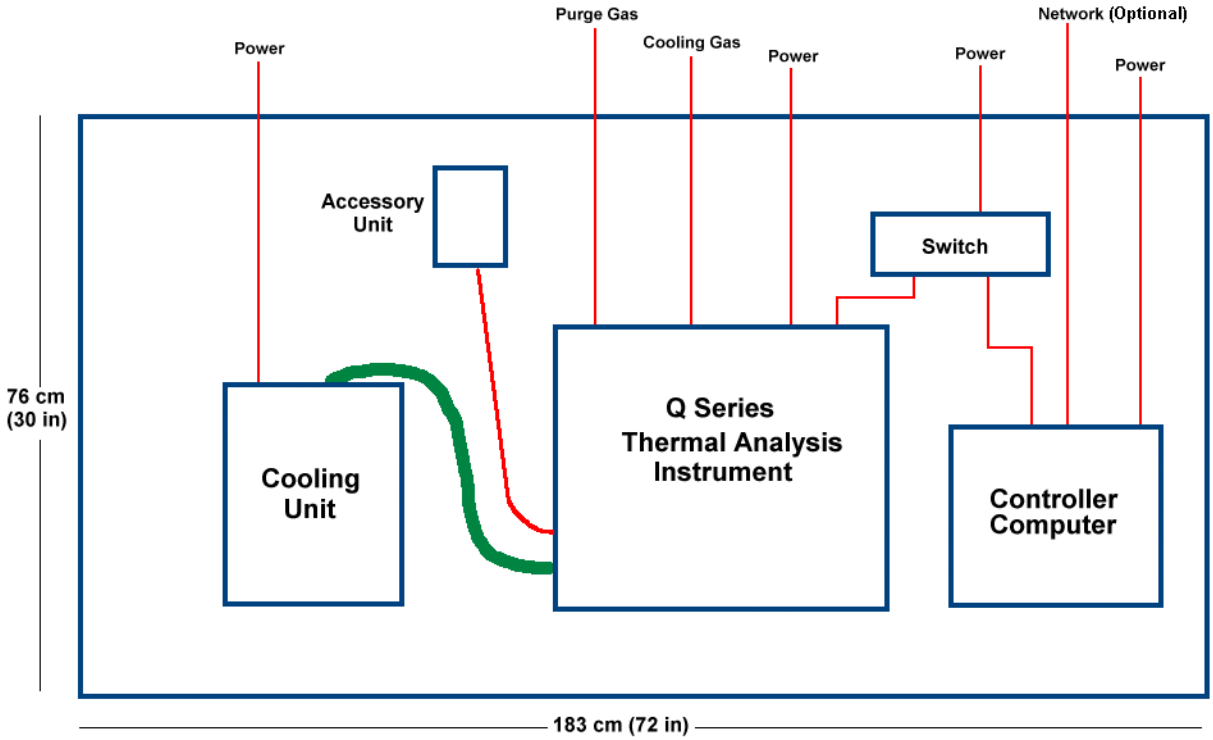
Requirements for Thermal Analysis Instruments

The following section summarizes laboratory requirements by instrument. Each section contains all of the requirements for that particular instrument. Therefore, some items will be redundant if you have purchased a multi-instrument system.

Q Series™ Instrument & Accessory Placement

The Q Series base system consists of a controller computer, Q Series instruments, and an optional cooling accessory. For accessory setup information in addition to what is provided here, refer to "Requirements for Miscellaneous Thermal Analysis Accessories" on page 25 of this document.

Select a location for the instrument with adequate floor space and a rigid laboratory bench that is level, has a minimum depth of 76 cm (30 in), and with a length of approximately 183 cm (72 in). Please refer to the layout shown in the figure below and the table on the next page for component placement.



If you wish to have your TA controller connected to your company network, you must supply two network interface cards. Your MIS/IT department should configure one of the Ethernet cards in the controller for communication with your in-house network, and should supply and install a second card to be used with the TA Q Series instruments. Your TA Instruments service representative will configure the second Ethernet card during start-up of the system to communicate with the Q Series instruments.



Using this configuration, you can archive data to another computer on the network or print results on a network printer.

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Q Series Instrument	Cooling Unit	Accessory	Location of Cooling Unit
DSC All Q Series DSC All Q Series DSC Q2000/Q1000, Q200/Q100	RCS LNCS [1]	— — PCA	Table Floor Table
TGA Q500, Q50 TGA Q5000 IR Q5000 SA	— — —	Heat exchanger Heat exchanger Heat exchanger	Table/floor Table/floor Table/floor
SDT Q600	—	—	—
TMA Q400	MCA MCA70	—	Table/floor Floor
DMA Q800	GCA ACS-3 NPC	—	Floor Floor Bench next to DMA

1. RCS is an optional cooler with PCA in use.

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Dimensions: Q20/Q10 Q200, Q100, Q2000, Q1000	 Depth 56 cm (22 in), Width 46 cm (18 in), Height 41 cm (16 in) Depth 56 cm (22 in), Width 46 cm (18 in), Height 48 cm (19 in)
Weight:	25 kg (54 lbs.); 8.6 kg (19 lbs) additional for built-in transformer for 230V operation; 4.5 kg (10 lbs) additional for an Autosampler.
Power requirements:	120 VAC, 47–63 Hz, 500 W [4.5 A] (Installation Category II) 230 VAC, 47–63 Hz, 500 W [2.25 A] (Installation Category II) 1.44 kW max with full power delivered through accessory outlets.
Laboratory conditions:	Temperature 15–35°C Relative Humidity 5–80% (non-condensing) Instrument should be located in a dust-free, vibration-free environment, away from exposure to direct sunlight and direct air drafts. (Pollution Degree 2 Environment) Maximum Altitude 2000 m (6560 ft)
Laboratory requirements:	Purge Gas(es) Pressure[1, 2] 100–140 kPa gauge (15–20 psig) Cooling Gas (Air) Pressure for use with Finned Air Cooling System[1, 3] 135–830 kPa gauge (20–120 psig) Cooling Gas (Nitrogen) Pressure for use with RCS or LNCS[1, 3] 135–830 kPa gauge (20–120 psig) Base Purge Gas Pressure for use with Quench Cooler, RCS or LNCS[1, 3] 100–140 kPa gauge (15–20 psig)

1. All gases must be dry and free of oil, dirt and water. The Purge Gas and Base Purge Gas are connected to the back of the instrument using 1/8-inch (O.D.) polyethylene tubing and Parker fittings. The Cooling Gas is connected to the back of the instrument using ¼ inch (O.D.) Polyflame tubing and a Parker fitting. (The tubing and fittings are provided in the DSC accessory kit.) Acceptable cell purge gases include air, nitrogen, oxygen, argon, and helium. Dry nitrogen should be used as the Base Purge gas. Dry nitrogen should also be used as the cooling gas with the RCS and LNCS. Nitrogen that is 99.998% pure and <5 ppm H_20 is recommended.
2. Mass flow controllers (MFC) are a standard feature. Typical purge gas flow rate to the cell is 50 mL/min with nitrogen. If your instrument does not have an MFC, an external flow meter is required.
3. Actual cooling gas and base purge gas flow rates are controlled by orifices installed in the DSC



References to “Installation Category” and “Pollution Degree” in this document are defined in the safety standards to which this equipment has been evaluated.

Installation Category II: The local level power distribution system intended to power appliances, portable equipment, etc. with smaller transient overvoltages than installation category III. For mains supply the minimum and normal category is II.

Pollution Degree 2: Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.

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Q20P/PDSC System

Dimensions: Q20P/Q10P PDSC cell only	 Depth 56 cm (22 in), Width 46 cm (18 in), Height 41 cm (16 in) Depth 24 cm (9.3 in), Width 22.4 cm (9 in), Height 33 cm (13 in)
Weight: Q20P/Q10P PDSC cell only	 25 kg (54 lbs.); 8.6 kg (19 lbs) additional for built-in transformer for 230V operation; 4.5 kg (10 lbs) additional for an Autosampler. 11 kg (23 lbs)
Power requirements:	120 VAC, 47–63 Hz, 350 W [3 A] (Installation Category II) 230 VAC, 47–63 Hz, 350 W [1.5 A] (Installation Category II) 1.44 kW max with full power delivered through accessory outlets.
Laboratory conditions:	Temperature 15–35°C Relative Humidity 5–80% (non-condensing) Instrument should be located in a dust-free, vibration-free environment, away from exposure to direct sunlight and direct air drafts. (Pollution Degree 2 Environment) Maximum Altitude 2000 m (6560 ft)
Laboratory requirements:	Q20P/Q10P DSC — No additional requirements PDSC Cell — Customer-supplied source of clean, dry pressurizing gas (inert, oxidizing, or reducing), and all accessory regulators, gauges and tubing[1]. The gas is usually obtained from a gas supply vendor in approved high-pressure tanks. If the PDSC Cell is to be operated under vacuum conditions, the customer must supply the vacuum source. The cell operating pressure range is from 1 Pa to 7 MPa (0.1 to 1,000 psig). If the PDSC Cell is used in the dynamic or constant pressure mode, and an indication of flow is required, an appropriate external flow meter must be obtained. Contact TA Instruments for a listing of suitable gases and vacuum suggestions.

1. All tubing connecting the PDSC Cell to other devices (e.g., gas cylinders, gauges, valves, or regulators) should be 3.18-mm (0.125-in) O.D. They must be rated for high pressure service to 21 MPa gauge (3,000 psig) and free of hydrocarbons. The gas source regulator must be rated to withstand the source pressure and possess two gauges—one to monitor the gas source pressure and the second to monitor the regulator output pressure. The regular should cover the experimental range of the PDSC Cell (up to 7 MPa gauge [1,000 psig]).

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Dimensions:	Depth 56 cm (22 in), Width 47 cm (19 in), Height 61 cm (24 in)
Weight:	37 kg (82 lbs.); 8.2 kg (18 lbs) additional for built-in transformer for 230V operation
Power requirements:	120 VAC, 47–63 Hz, 1.2 kW [10 A] (Installation Category II) 230 VAC, 47–63 Hz, 1.2 kW [10 A] (Installation Category II) 1.44 kW max with full power delivered through accessory outlets.
Laboratory conditions:	Temperature 15–35°C (Note: TGA balance mechanism is sensitive to changes in surrounding environmental conditions. For best results, room temperature should be regulated to eliminate temperature variations) Relative Humidity 5–80% (non-condensing) Instrument should be located in a dust-free, vibration-free environment, preferably on the ground floor in the building (**a marble balance table is required for best results**), away from pumps, motors, or other devices which produce vibrations, and away from exposure to direct sunlight and direct air drafts. (Pollution Degree 2 Environment). Maximum Altitude 2000 m (6560 ft)
Laboratory requirements:	Purge Gas(es) Pressure[1, 2] 70–140 kPa gauge (10–20 psig) Cooling Gas (Air) Pressure[1] 135–830 kPa gauge (20-120 psig)

1. All gases must be dry and free of oil, dirt and water. The Purge Gases are connected to the back of the instrument using 1/8-inch (O.D.) Polyethylene® tubing and Legris fittings. The Cooling Gas is connected to the back of the instrument using ¼ inch (O.D.) Polyethylene tubing and a Legris fitting. (The tubing and fittings are provided in the TGA accessory kit.) Acceptable purge gases include air, nitrogen, oxygen, argon and helium.
2. Purge gases are required for the balance and furnace/sample areas. Balance purge gas should always be inert to protect the balance assembly. Mass flow controllers (MFC) are a standard feature of the Q5000 IR. Purge gas flow rates are 10 mL/min and 25 mL/min to the balance and furnace/sample areas respectively.



Atmospheric pressure fluctuation can disturb sensitive TGA measurements. Ventilation systems should operate air handlers continuously and efforts should be made to minimize short term pressure fluctuations due to opening doors. Vents that allow air to move between adjacent rooms through walls, doors, or ceilings will help minimize measurement noise.

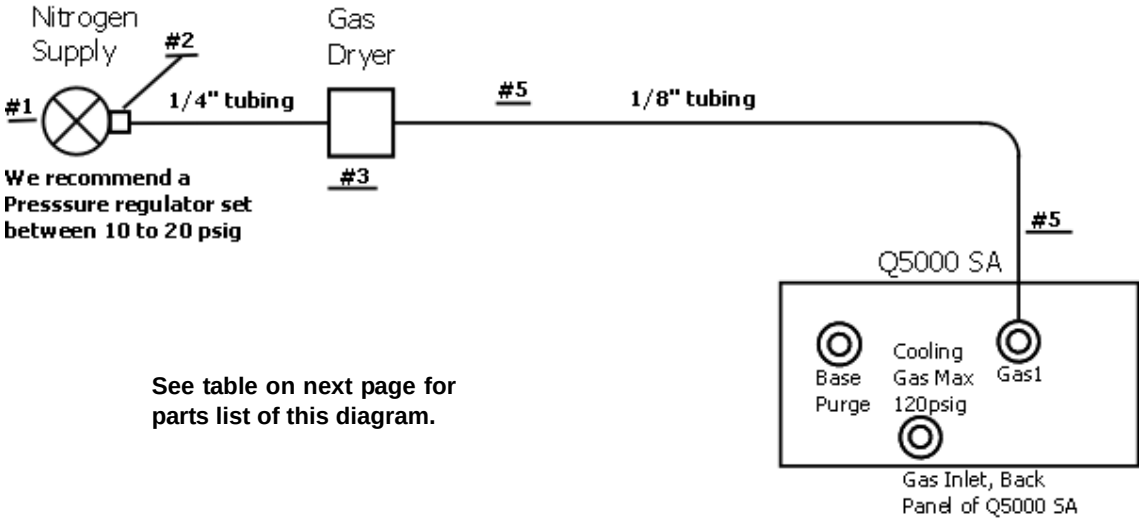
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Dimensions:	Depth 56 cm (22 in), Width 47 cm (19 in), Height 61 cm (24 in)
Weight:	40 kg (82 lbs.); 8.2 kg (18 lbs) additional for built-in transformer for 230V operation
Power requirements:	120 VAC, 47–63 Hz, [1.5 A] (Installation Category II) 230 VAC, 47–63 Hz, [1.5 A] (Installation Category II) 1.44 kW max with full power delivered through accessory outlets.
Laboratory conditions:	Temperature 15–35°C (Note: TGA balance mechanism is sensitive to changes in surrounding environmental conditions. For best results, room temperature should be regulated to eliminate temperature variations) Relative Humidity 5–80% (non-condensing) Instrument should be located in a dust-free, vibration-free environment, preferably on the ground floor in the building (**a marble balance table is required for best results**), away from pumps, motors, or other devices which produce vibrations, and away from exposure to direct sunlight and direct air drafts. (Pollution Degree 2 Environment). Maximum Altitude 2000 m (6560 ft)
Laboratory requirements:	Purge Gas(es) Pressure[1, 2] 70–140 kPa gauge (10–20 psig) Distilled water is required for humidity chamber

1. Purge gases are required for the balance and sample area (humidity chamber). Mass flow controllers (MFC) are a standard feature of the Q5000 SA. Purge gas flow rates are 200 mL/min for the humidity chamber and 10 mL/min to the balance. A gas dryer is supplied with the Q5000 SA.
2. Nitrogen purge gas is used for both the balance and sample area. The gas used must be dry and free of oil, dirt and water. The purge gases are connected to the back of the instrument using 1/8-inch (O.D.) Polyethylene® tubing and Legris fittings. (The tubing and fittings are provided in the Q5000 SA accessory kit.)

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Q5000 SA Gas Plumbing Diagram



See table on next page for parts list of this diagram.

Item	Quantity	Description
1	1	Regulator (not found in kit)
2	1	Legris 1/8-inch OD tube to 1/4-inch male NPT (American pipe thread)
3	1	Gas dryer, PN 200266.001
4	1	Legris “Y” 1/8-inch tube x 1/8-inch tube
5	15 ft	Tubing Polyethylene 1/8-inch OD x.030-inch width

Notes:

1 Item 1 can be purchased from TA Instruments.

2 Items 2 – 5 are located in the Accessory Kit.

3 Use 99.999% pure nitrogen to reduce moisture.

4 New or recently serviced and calibrated regulator is recommended.

5 Do not use Tygon tubing due to its high moisture permeability.

6 Make sure that the tubing is cut cleanly and squarely on the ends.

7 Leak check all tubing.

8 Use the supplied gas dryer, PN 200266.001, to prevent moisture buildup.

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Dimensions (Q50/Q500):	Depth 56 cm (22 in), Width 47 cm (19 in), Height 52 cm (21 in)
Weight:	31 kg (68 lbs.); 8.2 kg (18 lbs) additional for built-in transformer for 230V operation
Power requirements:	120 VAC, 47–63 Hz, 1.2 kW [10 A] (Installation Category II) - standard furnace 230 VAC, 47–63 Hz, 1.2 kW [5 A] (Installation Category II) - standard furnace 120 VAC, 47–63 Hz, 1.0 kW [8.3 A] (Installation Category II) - EGA furnace 230 VAC, 47–63 Hz, 1.0 kW [4.2 A] (Installation Category II) - EGA furnace 1.44 kW max with full power delivered through accessory outlets.
Laboratory conditions:	Temperature 15–35°C (Note: TGA balance mechanism is sensitive to changes in surrounding environmental conditions. For best results, room temperature should be regulated to eliminate temperature variations) Relative Humidity 5–80% (non-condensing) Instrument should be located in a dust-free, vibration-free environment, preferably on the ground floor in the building (**a marble balance table is required for best results**), away from pumps, motors, or other devices which produce vibrations, and away from exposure to direct sunlight and direct air drafts. (Pollution Degree 2 Environment). Maximum Altitude 2000 m (6560 ft)
Laboratory requirements:	Purge Gas(es) Pressure[1, 2] 70–140 kPa gauge (10–20 psig) Cooling Gas (Air) Pressure[1] 135–830 kPa gauge (20–120 psig)

1. All gases must be dry and free of oil, dirt and water. The Purge Gases are connected to the back of the instrument using 1/8-inch (O.D.) Polyethylene® tubing and Legris fittings. The Cooling Gas is connected to the back of the instrument using ¼ inch (O.D.) Polyethylene tubing and a Legris fitting. (The tubing and fittings are provided in the TGA accessory kit.) Acceptable purge gases include air, nitrogen, oxygen, argon and helium
2. Purge gases are required for the balance and furnace/sample areas. Balance purge gas should always be inert to protect the balance assembly. Mass flow controllers (MFC) are a standard feature of the Q500 and Q50. Purge gas flow rates are 40 mL/min and 60 mL/min to the balance and sample areas respectively for the standard furnace. They are 10 mL/min and 90 mL/min to the balance and sample areas for the EGA furnace.

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Dimensions:	Depth 56 cm (22 in), Width 60 cm (23 in), Height 48 cm (19 in)
Weight: Weight with transformer:	32 kg (70 lbs) 40 kg (88 lbs)
Power requirements:	120 VAC, 47–63 Hz, 1.2 kW [10 A] (Installation Category II) 230 VAC, 47–63 Hz, 1.2 kW [5 A] (Installation Category II) 1.44 kW max with full power delivered through accessory outlets.
Laboratory conditions:	Temperature 15–35°C Relative Humidity 5–80% (non-condensing) Instrument should be located in a dust-free, vibration-free environment, preferably on the ground floor in the building (**a marble balance table is required for best results**), away from exposure to direct sunlight and direct air drafts. (Pollution Degree 2 Environment). Maximum Altitude 2000 m (6560 ft)
Laboratory requirements:	Purge Gas(es) Pressure[1, 2] 70–140 kPa gauge (10–20 psig) Cooling Gas (Air) Pressure[1] 135–830 kPa gauge (20–120 psig)

1. All gases must be dry and free of oil, dirt and water. The Purge Gases are connected to the back of the instrument using 1/8-inch (O.D.) Polyethylene® tubing and Legris fittings. The Cooling Gas is connected to the back of the instrument using ¼ inch (O.D.) Polyethylene tubing and a Legris fitting. (The tubing and fittings are provided in the SDT accessory kit.) Acceptable purge gases include air, nitrogen, oxygen, argon and helium.
2. A mass flow controller (MFC) is a standard feature and is used to regulate the purge gas. Typical purge rates are 100 mL/min. If your instrument does not have an MFC, an external flow meter is required.

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Dimensions	Depth 56 cm (22 in), Width 46 cm (18 in), Height with furnace open 65 cm(26 in); Height with furnace closed 61 cm (24 in)
Weight: Weight with transformer:	32 kg (70 lbs) 40 kg (88 lbs)
Power requirements:	120 VAC, 47–63 Hz, 1.2 kW [10 A] (Installation Category II) 230 VAC, 47–63 Hz, 1.2 kW [5 A] (Installation Category II) 1.44 kW max with full power delivered through accessory outlets.
Laboratory conditions:	Temperature 15–35°C Relative Humidity 5–80% (non-condensing) Instrument should be located in a dust-free, vibration-free environment, preferably on the ground floor in the building (**a marble balance table is required for best results**), away from exposure to direct sunlight and direct air drafts. (Pollution Degree 2 Environment). Maximum Altitude 2000 m (6560 ft)
Laboratory requirements:	Purge Gas(es) Pressure[1, 2] 70–140 kPa gauge (10–20 psig) Cooling Gas (Air) Pressure[1] 135–830 kPa gauge (20–120 psig)

1. All gases must be dry and free of oil, dirt and water. The Purge Gases are connected to the back of the instrument using 1/8-inch (O.D.) Polyethylene® tubing and Legris fittings. The Cooling Gas is connected to the back of the instrument using ¼ inch (O.D.) Polyethylene tubing and a Legris fitting. (The tubing and fittings are provided in the TMA accessory kit.) Acceptable purge gases include air, nitrogen, oxygen, argon and helium.
2. A mass flow controller (MFC) is a standard feature and is used to regulate the purge gas. Typical purge rates are 100 mL/min. If your instrument does not have an MFC, an external flow meter is required.

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Dimensions	Depth 56 cm (22 in), Width 46 cm (18 in), Height with furnace open 71 cm(28 in); Height with furnace closed 56 cm (22 in)
Weight: Weight with transformer:	32 kg (70 lbs) 40 kg (88 lbs)
Power requirements:	120 VAC, 47–63 Hz, 600 W [5 A] (Installation Category II) 230 VAC, 47–63 Hz, 600 W [2.5 A] (Installation Category II) 1.44 kW max with full power delivered through accessory outlets.
Laboratory conditions:	Temperature 15–35°C Relative Humidity 5–80% (non-condensing) Instrument should be located in a dust-free, vibration-free environment, preferably on the ground floor in the building (**a marble balance table is required for best results**), away from exposure to direct sunlight and direct air drafts. (Pollution Degree 2 Environment). Maximum Altitude 2000 m (6560 ft)
Laboratory requirements:	Air Bearing Gas Pressure[1, 2] 410-450 kPa gauge (60–65 psig); flow rate 4 L/min Cooling Gas (Air) Pressure[1] 175–830 kPa gauge (20–120 psig)

1. All gases must be dry and free of oil, dirt and water. The Cooling Gas is connected to the back of the instrument using ¼ inch (O.D.) Polyethylene® tubing and a Legris fitting. (The tubing and fittings are provided in the DMA accessory kit.)
2. TA Instruments' Air Compressor Accessory (ACA) is available for laboratories that do not have a suitable gas supply for the air bearings.

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Dimensions:[1] VTI-SA VTI-SA+	 Depth 42 cm (16.5 in), Width 30.5 cm (12 in), Height 64 cm (25 in) Depth 44.5 cm (17.5 in), Width 43 cm (17 in), Height 67 cm (26.5 in)
Weight: VTI-SA VTI-SA+	 32 kg (71 lbs) 40 kg (89 lbs)
Software requirements:	Microsoft Excel® 2007 or newer with Solver Add In, English version (not supplied)
Power requirements:	Three 120 or 230 VAC electrical outlets are required for connecting the instrument, computer and monitor on a grounded breaker with a minimum of 20 or 15 (230 VAC) amps available. 120 VAC, 47–63 Hz [1.5 A] (Installation Category II) 230 VAC, 47–63 Hz [0.75 A] (Installation Category II) 1.44 kW max with full power delivered through accessory outlets.
Laboratory conditions:	Temperature 15–30°C Relative Humidity 5–80% (non-condensing) Instrument should be located in a dust-free, vibration-free environment, preferably on the ground floor of the building (**a marble balance table is strongly recommended for best results**), away from pumps, motors, or other devices which produce vibrations, and away from exposure to direct sunlight and direct air drafts. (Pollution Degree 2 Environment).
Laboratory requirements:	Nitrogen gas[2] is used to generate the humidity and dry mixtures. Dew point ≤ -40°C. Gas Pressure 70–140 kPa gauge (10–20 psig); an individual two-stage pressure regulator is required. Distilled water is required for humidity chamber (highest purity available is best).
Laboratory requirements: (Organic option)	Requires a ¼ inch or 6 mm OD line from the vent port of the instrument to a fume hood, window or other ventilation vehicle; the vent line should be Teflon® or stainless steel.

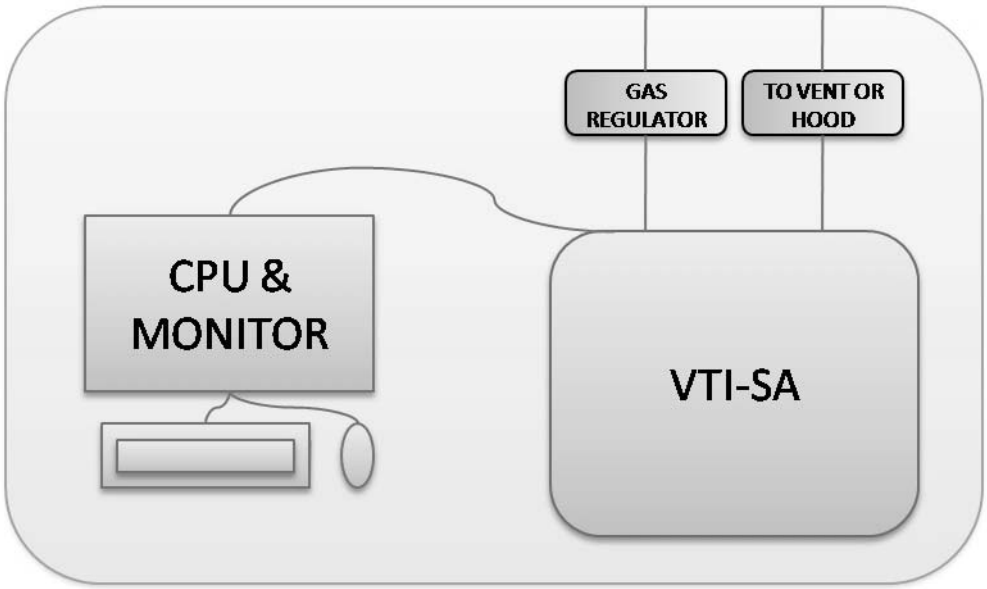
1. Allow for additional room to the sides and back of the unit for access during installation and maintenance.
2. All gases must be dry and free of oil, dirt and water. The nitrogen line is connected to the back of the instrument using ¼ inch (O.D.) Polyethylene® or stainless steel transfer line tubing and ¼ inch or 6 mm fitting. (The fitting at the unit is supplied on the instrument. The connection from the tank to the instrument is provided by the customer.

Additional Requirements for VTI-SA+ Camera Option

Description	Requirements
Available PCIe slot (1/2-height size)	One 1/2-height PCIe slot is required for video capture card.
Electrical outlet	One 120 or 230 VAC as specified above.

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VTI-SA Plumbing Diagram



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Requirements for Miscellaneous Thermal Analysis Accessories

Refrigerated Cooling System (RCS120, RCS90, RCS40) for use with DSC Instruments.



Specification	RCS120	RCS90	RCS40
Height Width Depth	88 cm (34.6) 35.6 cm (14.5) 56 cm (22 in)	46 cm (18 in) 26 cm (10 in) 51 cm (20 in)	26 cm (10 in) 26 cm (10 in) 51 cm (20 in)
Power requirements	230 VAC/8.5 A/50 Hz 230 VAC/7.5 A/60 Hz	120 VAC/12 A/60 Hz 220 VAC/6 A/50 Hz	120 VAC/6.25 A/60 Hz 220 VAC/4 A/50 Hz
Weight	102 kg (225 lbs)	47.7 kg (105 lbs)	24.8 kg (55 lbs)
Laboratory requirements	Same general environmental requirements as DSC. A base and cooling purge (nitrogen) is required in addition to the standard cell purge.		

If using an RCS as your cooling accessory, it is ideal to place the RCS on a table that is separate from your laboratory bench. If a table is not available, place the RCS on the laboratory bench to the right of the Discovery Series instrument.

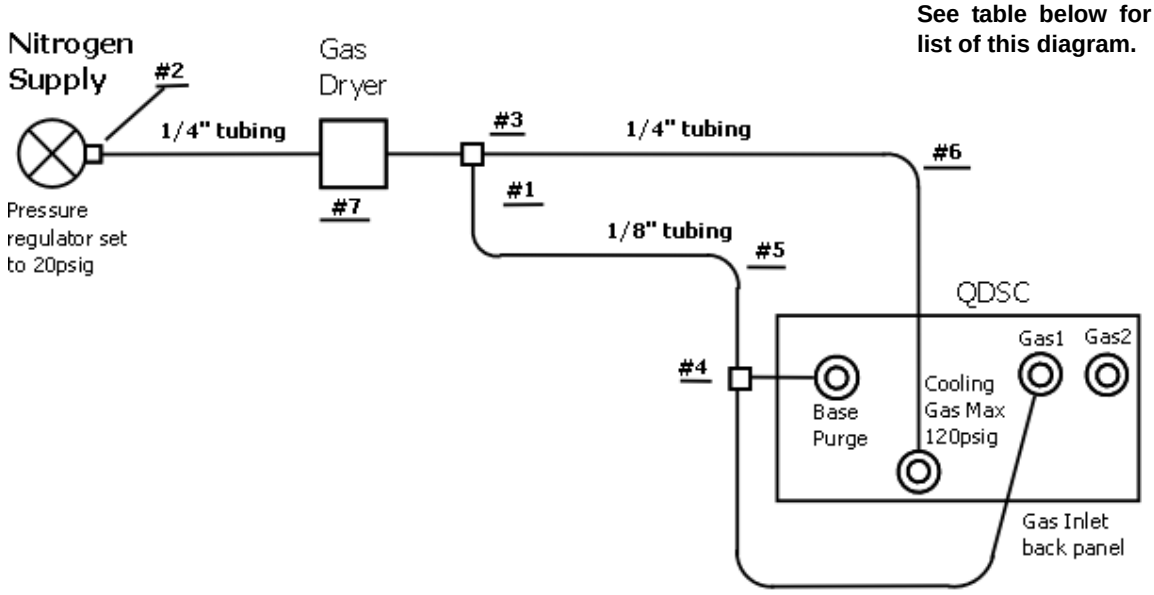
Refer to the Refrigerated Cooling System Getting Started Guide for more information.

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Below is a schematic showing you how to connect the gas plumbing lines to the instrument for the use of the RCS.

RCS Gas Plumbing Diagram

See table below for parts list of this diagram.



Item	Quantity	Description
1	1	Regulator (not found in kit)
2	1	Legris 1/4-inch OD tube to 1/4-inch male NPT (American pipe thread)
3	1	Legris 1/4-inch OD tee x 1/8-inch OD tube
4	1	Legris “Y” 1/8-inch tube x 1/8-inch tube
5	15 ft	Tubing, polyethylene, 1/8-inch OD x.030-inch width
6	25 ft	Tubing, Polyflame, 1/4-inch OD x.040-inch width
7	1	Gas dryer, PN 200266.001 (not found in kit)

Notes:

1 Items 1 and 7 can be purchased from TA Instruments.

2 Items 2 – 6 are located in the DSC Accessory Kit, 970012.901.

3 Use **99.999%** pure nitrogen to reduce moisture

4 New or recently serviced and calibrated regulator is recommended.

5 Do not use Tygon tubing due to its high moisture permeability.

6 Make sure that the tubing is cut cleanly and squarely on the ends.

7 Leak check all tubing.

8 Use gas dryer, PN 200266.001, to prevent moisture buildup.

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Liquid Nitrogen Cooling System (LNCS) for use with DSC Instruments

See the figure below for the correct placement of the LNCS unit on the floor to the left of the QDSC instrument.

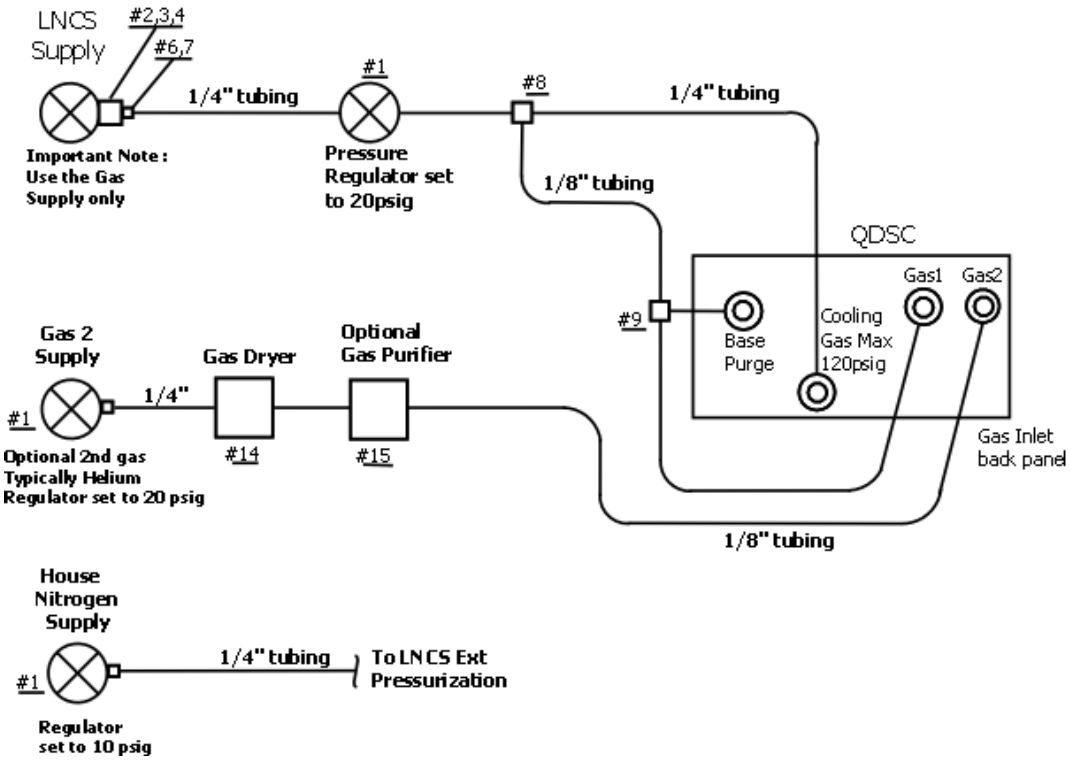


Dimensions	Width (diameter) 53 cm (21 in), Height 109 cm (43 in) (Unit designed to be placed on the floor.)
Weight:	52 kg (113 lbs) empty 88 kg (193 lbs) full
Power requirements:	85–264 VAC, 50/60 Hz, 0.18 kW
Laboratory conditions:	Temperature 15–35°C Relative Humidity 5–80% (non-condensing) Instrument should be located in a dust-free, vibration-free environment, preferably on the ground floor in the building (**a marble balance table is required for best results**), away from exposure to direct sunlight and direct air drafts. (Pollution Degree 2 Environment). Maximum Altitude 2000 m (6560 ft)
Laboratory requirements:	Same general environmental requirements as DSC. LNCS autofills during usage. Should be connected to a 160 L liquid nitrogen tank with pressure of 150–170 kPa gauge (22–25 psig). A base and cooling purge (nitrogen) is required in addition to the cell purge. Helium cell purge is required when operating below –100°C.

On the next page is a schematic showing you how to connect the gas plumbing lines to the instrument for the use of an LNCS.

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LNCS Gas Plumbing Diagram



Item	Quantity	Description
1	2	Regulator, 0 to 40 psig out (not found in kit)
2	1	92 Nut, CGA-580
3	1	15-3 Nipple CGA-580
4	1	Coupler, female-female 1/4-inch NPT (NPT=American pipe thread)
5	2	Legris plug-in reducer 1/8-inch OD x 1/4-inch OD
6	1	Legris male run Tee 1/4-inch OD x 1/4-inch NPT
7	1	Legris plug 1/4-inch OD
8	1	Legris tee 1/4-inch x 1/8-inch tube
9	1	Legris union “Y” 1/8-inch tube to 1/8-inch tube
10	1	Legris 1/4-inch OD tube to 1/4-inch male NPT
11	1	Legris 1/8-inch OD tube to 1/4-inch male NPT
12	15 ft	Tubing, polyethylene, 1/8-inch OD x.030-inch width
13	25 ft	Tubing, Polyflame, 1/4-inch
14	1	Gas dryer, PN 200266.001 (not found in kit)
15	1	Purge gas purifier, PN 970425.901 (not found in kit)

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Notes:

1 Items 1, 14, and 15 can be purchased from TA Instruments.

2 Items 2–5 are in the LNCS Accessory Kit (970398.901)

3 Items 6–13 are in the DSC Accessory Kit (970012.901)

4 Use new or recently serviced and calibrated regulators.

5 Do not use Tygon tubing due to its high moisture permeability.

6 Make sure that the tubing is cut cleanly and squarely on the ends.

7 Leak check all tubing.

8 Use **99.999%** pure **Helium** to reduce moisture buildup in the cell.

9 Use the gas dryer, PN 200266.001, to pre-dry and indicate unsatisfactory moisture levels.

10 Use the purge gas purifier, PN 970425.901, to achieve a dewpoint of –180°C.

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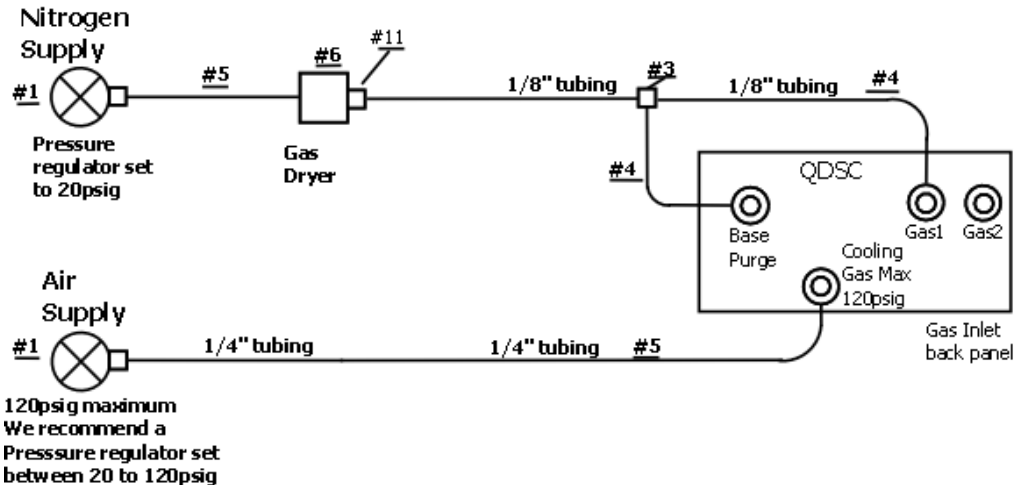
Finned Air Cooling System (FACS) for use with DSC Instruments

This section provides the laboratory requirements for the FACS and a schematic showing you how to connect the gas plumbing lines to the instrument for the use of an FACS.

Laboratory requirements:

- Same general environmental requirements as DSC.
- Cooling Gas (Air) Pressure for use with Finned Air Cooling System
  135–830 kPa gauge (20–120 psig)

FACS Gas Plumbing Diagram



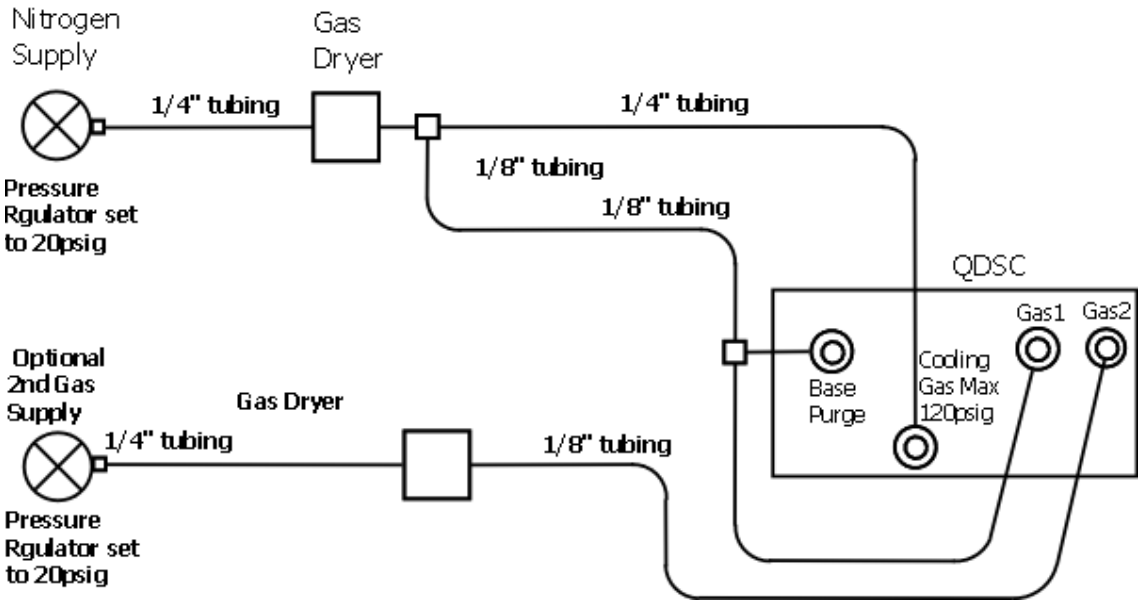
Item	Quantity	Description
1	1	Regulator (not found in kit)
2	1	Legris 1/8-inch OD tube to 1/4-inch male NPT (NPT=American pipe thread)
3	1	Legris “Y” 1/8-inch tube x 1/8-inch tube
4	15 ft	Tubing, polyethylene, 1/8-inch OD x.030-inch width
5	25 ft	Tubing, Polyflame, 1/4-inch OD x.040-inch width
6	1	Gas Dryer, P/N 2006.001 (not found in kit)

Notes:

- Item 1 can be purchased from TA Instruments.
- Items 2–5 are located in the DSC Accessory Kit, 970012.901.
- FACS uses cool gas constantly; therefore clean house air should be used. A filter is recommended.
- Use standard grade nitrogen.
- New or recently serviced and calibrated regulator is recommended.
- Make sure that the tubing is cut cleanly and squarely on the ends.
- Leak check all tubing.

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QDSC (with 2nd Gas) Plumbing Diagram



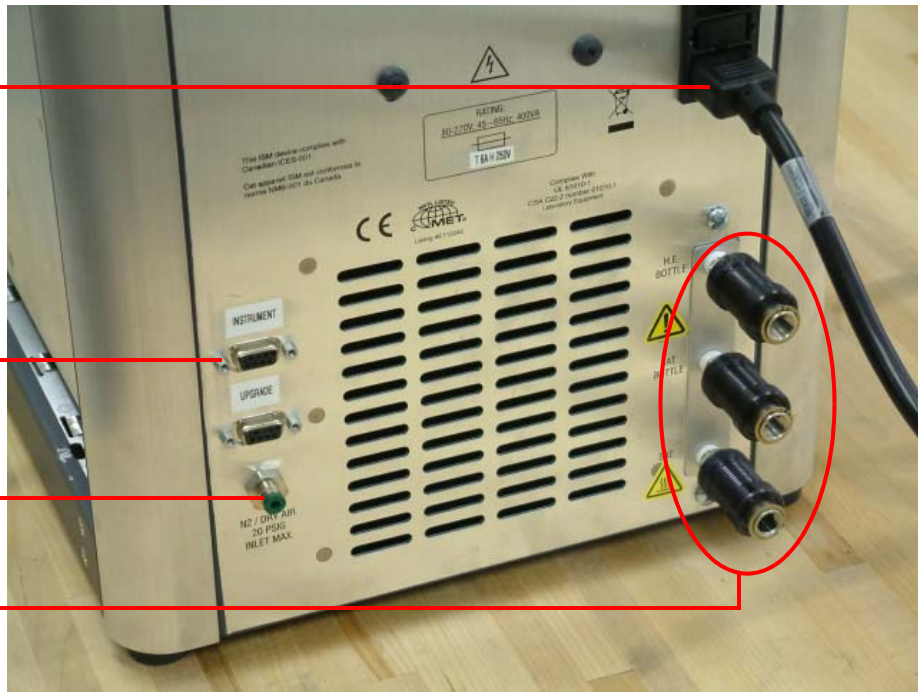
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DMA-RH Accessory

Dimensions of control enclosure	Height: 37 cm (14.5 in) Width: 30.5 cm (12 in) Depth: 51 cm (20 in)
Dimensions of sample chamber with attached transfer line	Height: 15 cm (5 ¾ in) Width: 21 cm (8 ¼ in) Depth: 18.5 cm (7 ¼) Transfer line length: 2.1 meters (7 feet)
Weight of control enclosure (without water)	27.2 kg (60 lbs)
Weight of sample chamber with transfer line	3.2 kg (7 lbs)
Electrical inlet power requirements	Voltage: 90–265 VAC Frequency: 45– 65Hz
Energy consumption	0.400 KVA
Laboratory conditions:	Temperature 15–35°C Relative humidity 5% to 80% RH from 15°C to 31°C, decreasing to 66% RH at 35°C (non-condensing) Instrument should be located in a dust-free, vibration-free environment, preferably on the ground floor in the building away from pumps, motors, or other devices which produce vibrations. Away from any type of magnetic field generating equipment, and away from exposure to direct sunlight and direct air drafts. (Pollution Degree 2 Environment).
Laboratory requirements:	Filtered nitrogen with dew point of –40°C or less Pressure: 138 kPa gauge (20 psi gauge) Volume: 3 SLPM

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DMA-RH Back Panel Connections



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Photocalorimeter Accessory (PCA) for use with DSC Q2000 and DSC Q200

Dimensions	Depth 44 cm (17 in) Width 28 cm (11 in), Height 15 cm (6 in)
Weight:	9.4 kg (21 lbs)
Power requirements:	90–132 VAC (3.5 A) / 180–246 VAC (2.0 A), 47–63 Hz; autorange selectable
Laboratory requirements:	Same general environmental requirements as DSC Q Series.

Air Compressor Accessory (ACA) for use with DMA Q800

Dimensions	Depth 38 cm (15 in), Width 38 cm (15 in), Height 23 cm (9 in)
Weight:	10 kg (22 lbs)
Power requirements:	120 VAC, 50/60 Hz, 0.3 kW
Laboratory requirements:	Same general environmental requirements as DMA. Should not be located in an enclosed area. Heat build-up occurs if air does not flow freely around the unit. Requires the use of a moisture filter regulator with autodrain, which is included with the DMA.

Gas Cooling Accessory (GCA) for use with DMA Q800

Dimensions	Width (diameter): Dewar 46 cm (18 in), Feet 79 cm (31 in); Height: 107 cm (42 in)
Weight:	46 kg (101 lbs.) - empty 87 kg (191 lbs) - full
Power requirements:	120 VAC at 0.9 kW, 47–63 Hz
Laboratory requirements:	Same general environmental requirements as DMA. GCA is refilled by connecting to a 160 L liquid nitrogen tank with pressure of 150–170 kPa gauge (20–25 psig).

Mechanical Cooling Accessory 70 (MCA70) for use with TMA Q400/Q400EM

Dimensions	Depth 51 cm (20 in), Width 26 cm (10 in), Height 46 cm (18 in)
Weight:	47.7 kg (105 lbs)
Power requirements:	120 VAC / 12 A / 60 Hz 220 VAC /6 A / 50 Hz
Laboratory requirements:	Same general environmental requirements as TMA. No additional purge gas requirements.

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Mass Spectrometer for use with TGA Instruments

Instrument compatibility	Discovery TGA, Q Series TGA
Dimensions (not including capillary)	Depth 61.5 cm (24 in) Width 26 cm (10 in) Height 41 cm (16 in)
Weight	28 kg (62 lbs)
Power Power adapter Pump inlet Backing pump Turbo pump Heaters Mains inlet All fuses	 240 VAC / 2A, 100 VAC / 5A, 50/60Hz 24VDC, 2.5A 24VDC, 3.15AT 5.0AT 8.0AT 6.3 AT 250 VAC 5x20 mm Ceramic Fast Acting
Laboratory conditions	Temperature 15–35°C Relative humidity 5–80% (non-condensing) Installation Category II Pollution Degree 2 The degree of protection for this instrument according to IEC 529 to IP20. Maximum altitude 2000 m (6560 ft) Instrument should be located Dust-free, vibration-free, sun-free, draft-free[1]
Laboratory requirements (High Pressure MS, only)	Purge gas pressure 7–14 kPa gauge (1–2 psig)[2]

1. Instrument should be located in a dust-free, vibration-free environment, preferably on the ground floor of the building (**a marble balance table is required for best results**), away from pumps, motors, or other devices which produce vibrations, and away from exposure to direct sunlight and direct air drafts.
2. The purge gas should be dry and free of oil, dirt and water. The Purge Gas is connected to the back of the instrument using a ¼ inch (O.D.) compression fitting. Acceptable purge gases include nitrogen or argon.

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Air Chiller System (ACS) and Chiller Panel for use with Q800 DMA

	ACS-2	ACS-3
Dimensions of Air Chiller (H x W x D): Without Chiller Panel With Chiller Panel	88.5 cm (35 in) x 37 cm (14.5 in) x 56 cm (22 in) 88.5 cm (35 in) x 52 cm (20.5 in) x 56 cm (22 in)	112 cm (44 in) x 37 cm (14.5 in) x 56 cm (22 in) 112 cm (44 in) x 52 cm (20.5 in) x 56 cm (22 in)
Weight of Air Chiller: Without Chiller Panel With Chiller Panel	96 kg (211 lbs) 112 kg (247 lbs)	121 kg (267 lbs) 137 kg (302 lbs)
Dimensions of Chiller Panel:	Height: 86.4 cm (34 in) Width: 48.3 cm (19 in) Depth:38.1 cm (15 in)	Height: 86.4 cm (34 in) Width: 48.3 cm (19 in) Depth:38.1 cm (15 in)
Weight of Chiller Panel:	15.8 kg (35 lbs)	15.8 kg (35 lbs)
Power requirements:	220–230 VAC 50 Hz or 60 Hz (refer to the serial number plate on the rear of the unit) Nominal 9.3A, Max 12A	
Refrigerants	1st Stage: R404A 2nd Stage: R290 & R508B Each in varying amounts and substantially less than 500g each.	1st Stage: R404A 2nd Stage: R290 & R508B 3rd Stage: R290 & R14 Each in varying amounts and substantially less than 500g each.
Cooling Gas requirements:	Gas: Air or nitrogen Pressure: 6.2–6.9 bar (90–100 psi) Flow rate: 200 L/min Temperature: 20–30°C Dew point[1]: Must not exceed the ambient air temperature by more than 5°C.	
Ambient Air[2]	12°C–21°C = Acceptable 21°C–24°C = Ideal Heat Generation: ACS-3: 1800 W; ACS-2: 1450 W	
Operating altitude	2000 meters maximum	
Relative humidity	5% to 80% RH from 15°C to 30°C	

1. Dew point is specified at operating pressure.
2. The ACS generates a significant quantity of heat when running. These operating temperatures must be maintained during system operation.

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Nitrogen Purge Cooler Accessory for use with Q800 DMA

Dimensions of Dewar flask:	Height: 15 in. Width: 12 in. Depth: 7 in. Volume: 2.5 L
Weight of Dewar flask	6 lbs (without liquid nitrogen)
Cooling Gas requirements:	Gas: Nitrogen ONLY Pressure: 25–120 psi Flow rate: 30 l/min

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