Thermo Scientific
UltiMate 3000 Series

UltiMate 3000 LC Systems
Preinstallation Requirements Guide

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UltiMate 3000 LC System Preinstallation Information

It is our intention to provide you with an excellent installation experience. To achieve this, we need to ensure that certain preparations for the installation have been completed. This guide is intended to provide information about those preparations. It provides details to help you answer the questions on the pre-installation letter you have been asked to complete and return to your installation co-ordinator.

Contents

1 Introduction

This *UltiMate 3000 LC System Preinstallation Requirements* document contains information specific to the standalone UltiMate 3000 LC system. A typical standalone system consists of an UltiMate 3000 solvent rack, a pump, an autosampler, a thermostatted column compartment and a detector.

The UltiMate 3000 LC system is designed to operate reliably under controlled environmental conditions. As the purchaser, you are responsible for providing a suitable location, a suitable operating environment, a source of power of acceptable quality, correct solvent supplies, and proper waste systems.

Operating an UltiMate 3000 LC system or maintaining it in a condition outside the power and operating environment specifications described in this guide might cause failures of many types. The repair of such failures is specifically excluded from the standard warranty and service contract coverage.

1.1 How to Use This Guide

This *UltiMate 3000 LC System Preinstallation Requirements Guide* is designed to provide you with information to plan and prepare your lab site prior to delivery and installation of your system. Please read each chapter carefully to be sure that your laboratory is ready for the installation of your system.

This *Preinstallation Requirements Guide* includes information about the UltiMate 3000 Solvent Racks, UltiMate 3000 Pumps, UltiMate 3000 Autosamplers, UltiMate 3000 Thermostatted Column Compartments, UltiMate 3000 Detectors, and the UltiMate 3000 Automated Fraction Collector.

This guide additionally contains information about the Dionex Corona Charged Aerosol Detectors and the ERC™ RefractoMax 521.

The UltiMate 3000 modules are controlled by a chromatography data system. The data system hardware consists of a desktop computer, a monitor, and an optional printer. If you are integrating your UltiMate 3000 LC system with a Thermo Scientific mass spectrometer, please also refer to the *Preinstallation Requirements Guide* of the mass spectrometer.

For additional information, request specific preinstallation support directly through your local sales or service office for Thermo Fisher Scientific products.

This guide is provided "as is". Every effort has been made to supply complete and accurate information and all technical specifications have been developed with the utmost care. The information contained in this guide should not be construed as a commitment by Thermo Fisher Scientific. Thermo Fisher Scientific assumes no responsibility for any errors that may appear in this document that is believed to be complete and accurate at the time of publication and, in no event, shall Thermo Fisher Scientific be liable for incidental or consequential damages in connection with or arising from the use of this document. We appreciate your help in eliminating any errors that may appear in this document.

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1.2 Related Documentation

In addition to this guide, Thermo Fisher Scientific provides the following documents as PDF files or printed booklets for the UltiMate 3000 LC system:

- Thermo Scientific Dionex UltiMate 3000 Series SR-3000 Solvent Rack Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series SRD-3x00 Solvent Racks Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series SD, RS, BM, and BX Pumps Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series AutosamplersWPS-3000TPL RS and WPS-3000FC Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series Autosamplers WPS-3000SL and WPS-3000RS Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series Autosampler Column Compartment ACC-3000 Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series Column Compartments TCC-3000SD and TCC-3000RS Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series Variable Wavelength Detectors VWD-3100 and VWD-3400RS Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series Diode Array Detectors DAD-3000(RS) and MWD-3000(RS) Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series Fluorescence Detectors FLD-3100 and FLD-3400RS Operating Instructions
- Thermo Scientific Dionex Corona Veo (RS) Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series Electrochemical Detector ECD-3000RS Operating Instructions
- ERC™ Inc. RefractoMax 521 Refractive Index Detector Operator`s Manual
- Thermo Scientific Dionex UltiMate 3000 Series PCM-3000 pH and Conductivity Monitor for DAD-3000(RS), MWD-3000(RS) and VWD-3x00(RS) Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series Nano/Cap System NCS-3500RS and Nano/Cap Pump NCP-3200RS Operating Instructions
- Thermo Scientific Dionex UltiMate 3000 Series Automated Fraction Collector AFC-3000 Operating Instructions

1.3 Safety

The CE Mark label and cTUVus Mark safety label on the instrument indicate that the module is compliant with the related standards.

Make sure you follow the precautionary statements presented in this guide.

1.3.1 Symbols on the Instruments and in the Preinstallation Requirements Guide

The table shows the symbols used on the UltiMate 3000 instruments and/or this *Pre-Installation Requirements Guide*:

Symbol	Description
	Electrical power is on (–)—L'instrument est mis sous tension (–) and Electrical power is off (**O**)—L'instrument est mis hors tension (**O**)
~	Alternating current—Courant alternatif
	Direct current—Courant continu
	Protective conductor terminal, ground—Conducteur de protection
	Fuse—Fusible
	High voltage, risk of electrical shock—Haute tension, risque de choc électrique
	Component susceptible to electrostatic discharge—Le composant est susceptible de la décharge électrostatique
	Surface becomes hot during operation—La surface devient chaude lors du fonctionnement.
	Pinch point hazard—To avoid injury during autosampler operation, keep your hands away from the syringe. Risque de pincement—Pour éviter des blessures pendant l'opération du passeur d'échantillon, tenez vos mains à distance de la seringue.
	Pinch point hazard—Risque de pincement
	Refer to the *Operating Instructions* to prevent risk of harm to the operator and to protect the instrument against damage. Référez-vous à ce manuel pour éviter tout risque de blessure à l'opérateur et/ou protéger l'instrument contre tout dommage.

Symbol	Description
	The deuterium lamp emits UV radiation that is harmful to the eyes and skin. Therefore, avoid looking directly into the light source. Operate the lamp only in the detector with the lamp cover installed and never outside the instrument.
	Label according to the "Measures for Administration of the Pollution Control of Electronic Information Products" (China RoHS) guideline Étiquette "Measures for Administration of the Pollution Control of Electronic Information Products" (China RoHS)
	WEEE (Waste Electrical and Electronic Equipment) label—For more information, see the WEEE Information section in the "Installation and Qualification Documents for Chromatography Instruments" binder. Étiquette DEEE (Déchets d'Equipements Electriques et Electroniques)—Pour plus d'informations, référez-vous au chapitre WEEE Information dans le classeur "Installation and Qualification Documents for Chromatography Instruments".

At various points throughout this guide, messages of particular importance are indicated by certain symbols:

Tip: Indicates general information and information intended to optimize the performance of the instrument.

Caution: High voltage, risk of electrical shock.

Attention: Haute tension, risque de choc électrique.

Important: Indicates that failure to take note of the accompanying information could cause wrong results or may result in damage to the instrument.

Important: Indique que ne pas tenir compte de l'information jointe peut conduire aux résultats faux ou endommager l'instrument.

Warning: Indicates that failure to take note of the accompanying information may result in personal injury.

Avertissement: Indique que ne pas tenir compte de l'information jointe peut entraîner des blessures corporelles.

1.3.2 General Safety Precautions

When working with analytical instrumentation, you should know the potential hazards of using chemical solvents.

Tips: Before initial operation of the instruments, make sure that you are familiar with the contents of this *Preinstallation Requirements Guide* and the *Operating Instructions* of the respective module.

Observe any warning labels on the device and refer to the related sections in the respective *Operating Instructions*.

For the general safety precautions in French, see page 10.

To avoid the possibility of personal injury or damage to the instrument, observe the following general safety precautions when operating the instrument or performing maintenance and repair procedures:

- Install the HPLC system in a well-ventilated laboratory. If the mobile phase includes volatile or flammable solvents, do not allow them to enter the workspace.
- All instruments should be on the same ground.
- The modules are too heavy and/or bulky for one person alone to handle safely. Therefore, a team effort is required to lift or move the modules.
- When connecting the capillaries, make sure that the connectors are free from contaminants. Even minute particles may cause damage to the system (for example, the column).
- If the mobile phase includes volatile or flammable solvents, avoid open flames and sparks.
- Always replace blown fuses with the fuses recommend by Thermo Fisher Scientific.
- Replace faulty power cords and communication cables.
- Many organic solvents and buffers are toxic. Know the toxicological properties of all mobile phases that you are using.
- The toxicological properties of many samples may not be well known. If you have any doubt about a sample, treat it as if it contains a potentially harmful substance.
- Wear goggles when handling mobile phases or operating the instrument. An eyewash facility and a sink should be close to the unit. If any mobile phase splashes on the eyes or skin, wash the affected area and seek medical attention.
- Dispose of waste mobile phase in an environmentally safe manner that is consistent with all local regulations. Do not allow flammable or toxic solvents to accumulate. Follow a regulated, approved waste disposal program. Never dispose of flammable or toxic solvents through the municipal sewage system.
- We recommend the use of HPLC- or LC/MS-grade solvents and additives only.

- Use only reagents and buffers that are compatible with all parts that may be exposed to solvents. For information about the wetted parts, refer to the Technical Information section of the respective *Operating Instructions.*
- In an UltiMate 3000 system, some components are made of PEEK™. While this polymer has superb chemical resistance to most organic solvents, it tends to swell when in contact with trichloromethane ($CHCl_3$), dimethyl sulfoxide (DMSO), or tetrahydrofuran (THF). In addition, it is attacked by concentrated acids, such as sulfuric acid and nitric acid or a mixture of hexane, ethyl acetate, and methanol. Swelling or attack by concentrated acids is not a problem with brief flushing procedures.
- Do not use PEEK tubing that is stressed, bent, or kinked.
- Use only the spare parts and accessories recommended in the instruments' *Operating Instructions*. Substituting parts may impair the performance of the instrument.
- Do not use the instruments in ways other than those described in the respective *Operating Instructions*.

1.3.3 Consignes Générales de Sécurité

Veuillez noter: Avant de commencer à utiliser l'instrument, assurez-vous que vous vous êtes familiarisés avec le contenu de ce manuel.

Observez des étiquettes d'avertissement sur l'appareil et référez-vous aux sections correspondantes dans ce mode d'emploi.

Lors de l'utilisation des solvants soyez vigilent aux symboles et mentions de prudence SGH.

Veuillez observer les consignes générales de sécurité suivantes lorsque vous utilisez l'instrument ou que vous procédez à des opérations de maintenance afin d'éviter tous risques de préjudice corporel et de détérioration de l'instrument:

- Installez le système HPLC dans un laboratoire bien ventilé. Si la phase mobile contient des solvants volatils ou inflammables, empêchez qu'ils ne pénètrent dans l'espace de travail.
- Tous les éléments du système devraient être placés au même niveau.
- Le système est trop lourd et/ou encombrant pour être soulever ou déplacer par une personne seule. Par conséquent, un effort d'équipe est exigé pour soulever ou déplacer l'instrument.
- Lorsque vous connectez les capillaires, assurez-vous que les raccords sont exempts de tout contaminant. Même d'infimes particules peuvent causer des dommages au système (ex. colonne).
- Si la phase mobile contient des solvants volatils ou inflammables, évitez les flammes nues et les sources d'étincelles à proximité.
- Si une fuite survient, arrêtez l'instrument et résolvez le problème immédiatement.
- Remplacez toujours les fusibles grillés par des fusibles de rechange recommandés par Thermo Fisher Scientific en ce manuel.
- Remplacez les cordons d'alimentation électrique et les câbles de communication défectueux.
- De nombreux solvants organiques et solutions salines sont toxiques. Informez-vous des propriétés toxicologiques de toutes les phases mobiles que vous utilisez.
- Les propriétés toxicologiques de nombreux échantillons peuvent être mal connues. Au moindre doute concernant un échantillon, traitez-le comme s'il contenait une substance potentiellement dangereuse.
- Portez des lunettes de protection lorsque vous manipulez des phases mobiles ou que vous utilisez l'instrument. Une installation permettant de se laver les yeux ainsi qu'un lavabo doivent se trouver à proximité du système. Si une phase mobile, quelle qu'elle soit, entre en contact avec vos yeux ou votre peau, rincez abondamment la zone affectée à l'eau, puis.

- Débarrassez-vous de tous les déchets de phase mobile de manière écologique, conformément à la règlementation en vigueur au niveau local. Empêchez impérativement l'accumulation de solvants inflammables et/ou toxiques. Suivez un programme d'élimination des déchets règlementé et approuvé. Ne jetez jamais de solvants inflammables et/ou toxiques dans le système municipal d'évacuation des eaux usées.
- Utilisez uniquement des solvants & réactifs qualité HPLC ou LC/MS
- Assurez vous que les solutions tampons et réactifs sont compatibles avec les matériaux exposés et les. Pour des informations sur les matériaux exposés, référez-vous à la section technique en ce manuel de l'instrument.
- Dans un système UltiMate 3000, certaines composantes sont en PEEK™. Bien que ce polymère présente une excellente résistance chimique à la plupart des solvants organiques, il a tendance à gonfler lorsqu'il est en contact prolongé avec du chloroforme ($CHCl_3$), du diméthyle sulfoxyde (DMSO) ou du tétrahydrofurane (THF). De plus, il est attaqué par des acides concentrés tels que l'acide sulfurique et l'acide nitrique ou d'un d'un mélange hexane, éthyle acétate et méthanol. Ces acides peuvent cependant être utilisés dans le cadre de procédures de nettoyage, à condition que l'exposition soit brève.
- N'utilisez pas de tubes PEEK écrasés, pliés ou abimés.
- Utilisez seulement des pièces de rechange ou des accessoires recommandées en ce manuel. L'utilisation d'autres pièces peut affecter les performances de l'instrument.
- N'utilisez pas l'instrument de manière autre que celles décrites dans ce manuel.

1.4 Intended Use

The devices are designed to be operated only be qualified and authorized personnel. All users must know the hazards presented by the device and the used substances.

The UltiMate 3000 system is designed for laboratory research use only in high-performance liquid chromatography (HPLC) or ultra-high performance liquid chromatography (UHPLC) applications. A PC with a USB 2.0 port is required.

The UltiMate 3000 instruments can be controlled by the Chromeleon Chromatography Management System. The UltiMate 3000 system can also be operated with other data systems, such as

- Xcalibur™, Compass™/HyStar™, or Analyst®. Installation of the DCMS^{Link} (Thermo Scientific Dionex Chromatography Mass Spectrometry Link) or SII (Standard Instrument Integration) software is required in addition to the installation of the data system (software and instrument compatibility vary, please speak to your salesperson for detailed information).
- Empower™. Installation of the Thermo Scientific Dionex Instrument Integration Software is required in addition to the installation of the data system.

For more information, contact the Thermo Fisher Scientific sales organization for Dionex HPLC Products.

If there is any question regarding appropriate usage, contact Thermo Fisher Scientific before proceeding.

Warning: If the devices are used in a manner not specified by Thermo Fisher Scientific, the protection provided by the respective device could be impaired. Thermo Fisher Scientific assumes no responsibility and will not be liable for operator injury and/or instrument damage. Whenever it is likely that the protection is impaired, the instrument must be disconnected from all power sources and be secured against any intended operation.

Avertissement: Si l'instrument est utilisé de façon non spécifiée par Thermo Fisher Scientific, la protection prévue par l'instrument pourrait être altérée. Thermo Fisher Scientific n'assume aucune responsabilité et ne sera pas responsable des blessures de l'operateur et/ou des dommages de l'instrument. Si la protection de l'instrument n'est pas garanti à tout moment, débranchez l'instrument de toutes les sources d'alimentation électrique et assurez-vous que l'instrument n'est pas utilisé involontairement.

1.5 Federal Communications Commission (FCC) Note

The UltiMate 3000 system has been tested and found to comply with the limits of Class A digital devices, pursuant to part 15 of the U.S. FCC Rules. These limits are designed to provide reasonable protection against harmful interferences when the equipment is operated in 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 expense.

2 Site Preparation

It is important that you prepare the site before your field service engineer can install the system. Please review the space and load requirements provided in this chapter and ensure that the laboratory workbenches are large enough and strong enough to support the data system hardware and the LC system. To facilitate communication with a service engineer, install a telephone near the LC system workbench.

Tip: If you are integrating the UltiMate 3000 LC system with a mass spectrometer, please refer to the *Preinstallation Requirements guide* for your mass spectrometer for its site requirements.

2.1 Shipping Containers

Table 1 lists the dimensions of the shipping containers for the components of the UltiMate 3000 LC system.
The system is provided with all necessary solvent reservoirs, power cables, and communication cables.

Table 1: Shipping container dimensions and weight.

Component	Height		Width		Depth		Weight	
	cm	inch	cm	inch	cm	inch	kg	lbs
SRD-3x00	45	18	67	27	60	24	≤13.0	≤28.0
LPG Style Pumps	45	18	67	27	60	24	≤22.0	≤48.5
HPG and DGP Style Pumps	45	18	67	27	60	24	≤24.0	≤54
Autosamplers	63	25	67	27	60	24	≤26.0	≤58.0
Thermostatted Autosamplers	63	25	67	27	60	24	≤33.0	≤72.0
Thermostatted Column Compartments	45	18	67	27	60	24	≤19.0	≤42.0
Optical Detectors (VWD, MWD, DAD, FLD)	45	18	67	27	60	24	≤23.0	≤51.0
RefractoMax 521 RI	30	12	40	16	58	23	15	33
Corona Veo (RS)	63	25	67	27	60	24	≤27.0	≤58.0
ECD-3000RS	45	18	67	27	60	24	≤23.0	≤51.0
AFC-3000	34	13	65	26	58	23	13.4	17.6

2.2 Space and Load Requirements

Prepare a bench top for the UltiMate 3000 system in a clean, well-ventilated area. Please make sure that the required bench-top space is available to install all system components and the data system properly.

Tables 2 to 4 list the minimum bench-top areas, space requirements and the weight of the components of the UltiMate 3000 LC system.

Figure 1 shows the recommended layout for a standalone UltiMate 3000 LC system with an UltiMate 3000 series detector, column compartment, autosampler, pump, and a solvent rack. Allow at least 150 cm (59 inch) for the installation of the shown setup, including the data system and printer.

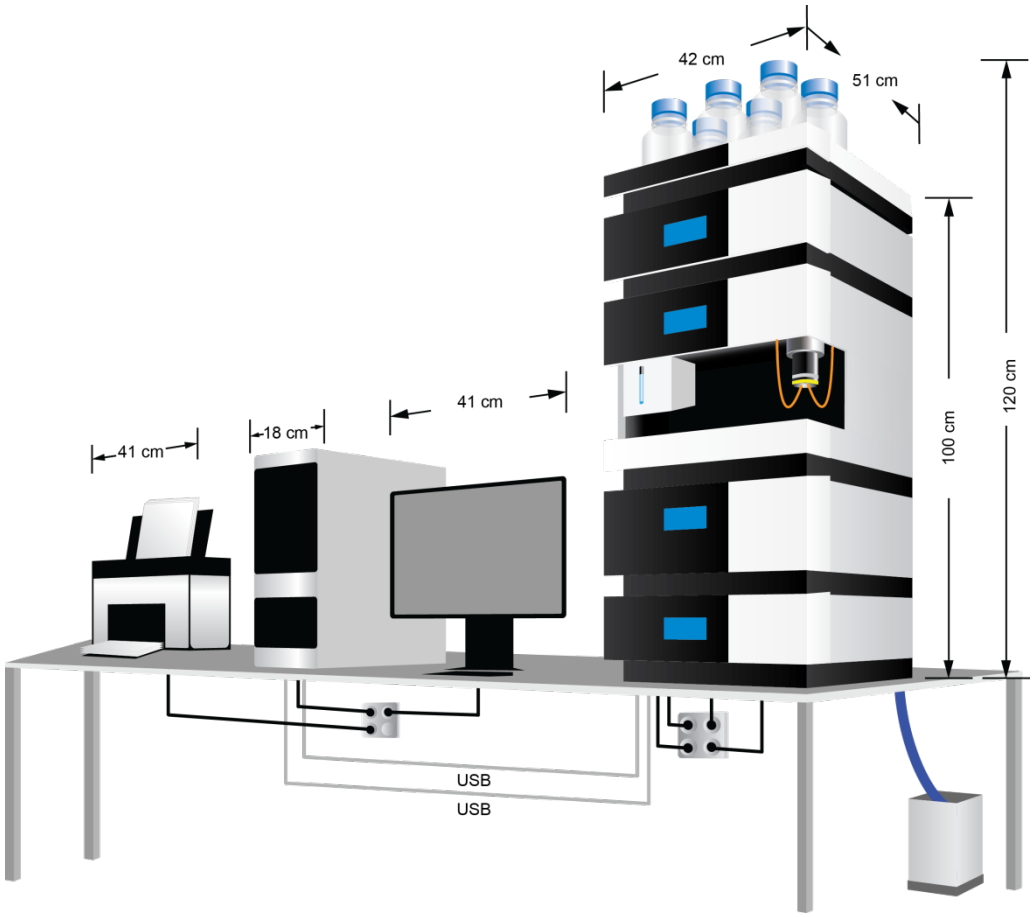

Figure 1: Recommended layout for a stand-alone UltiMate 3000 LC system with data system.

Allow extra bech-top space for the installation of switching valves or an UltiMate 3000 pH and Conductivity Monitor PCM-3000, for instance. Definite dimensions are listed in Table 2.

Table 2: Minimum bench-top space requirements for the installation of an UltiMate 3000 system (without data system and printer).

LC System	**Width**		**Depth**	
	cm	**inch**	**cm**	**inch**
Single stack including a WPS-3000 or an ACC-3000(T)	42	16.6	51	20.1
Additionally:				
One Valve (if mounted to TCC-3000)	6	2.4	-	-
Two Valves (if mounted to TCC-3000)	12	4.8	-	-
PCM-3000 (if mounted to detector)	11	4.3	-	-

LC System	Width		Depth	
Stack including OAS-3x00 Open Autosampler with table	68	27	72	28

The main power switch and the main power receptacle are located on the rear panel of the instruments. Make sure that free and unrestricted access to the main power switch is ensured and that the power cord of the device can be easily reached and disconnected from the power line at all times. Provide at least 15 cm (6 inch) of space between the back of the system and any wall or obstruction to unplug the cables.

Tip: The AFC-3000 cannot be placed in the UltiMate 3000 stack and requires extra bench space. For the dimensions of each module, please refer to Table 4.

Please refer to Table 3 for the recommended vertical height requirements of your UltiMate 3000 system.

Table 3: Recommended minimum vertical height requirements of various UltiMate 3000 system setups.

	System Configuration Example				
Solvent Racks SR(D)	x	x	x	x	x
Pump	x	x		x	x
Wellplate Autosampler WPS / ACC	x	x	x	x	x
Thermostatted Column Comparment TCC	x	x	x		x
Optical and Electrochemical Detectors VWD/DAD/MWD/FLD/ECD	x	x	x	x	
Corona Veo Charged Aersol Detector		x			
Extra head space for eluent bottles and solvent tubing	x	x	x	x	x
Minimum recommended height [cm]*	120	140	125	105	105
Minimum recommended height [inch]*	47,2	55,1	49,2	41,3	41,3

* This height provision will allow sufficient access to the 1-liter solvent bottles in the solvent platform. If you plan to use larger solvent containers, allow more vertical space.
** Depending on height of adjustable table

Tip: Due to the variety of modules and enormous number of possible combinations, only the most frequently used system combinations are shown. If your system configuration is not listed, please contact your local Thermo Scientific representative for more information.

The workbench must be capable of supporting the weight of the UltiMate 3000 LC system including filled eluent bottles, and the data system hardware, plus the weight of any options. If necessary, place the desktop computer, monitor, Ethernet switch, and printer on a separate workbench. For the dimensions and weight of the UltiMate 3000 modules, please refer to Table 4.

⚠ **Important:** For your safety and to avoid instrument damage, Thermo Fisher Scientific recommends using a workbench that supports at least twice the load of the equipment to be placed on it.

For your safety and to avoid instrument damage, ask for assistance when you move the pump, the detector, the column compartment or the autosampler.

Table 4: Dimensions of the modules of the UltiMate 3000 system (excluding the solvent bottles).

Component	Height		Width		Depth		Weight	
	cm	**inch**	**cm**	**inch**	**cm**	**inch**	**kg**	**lbs**
SR-3000 (w/o bottles)	10	4.0	42	16.6	51	20.1	3.0	6.6
SRD-3x00 (w/o bottles)	10	4.0	42	16.6	51	20.1	≤4.8	≤10.6
LPG-3400SD/RS	16	6.3	42	16.6	51	20.1	13.6	30.0
DGP-3600SD/RS	16	6.3	42	16.6	51	20.1	16.6	36.6
HPG-3200SD/RS	16	6.3	42	16.6	51	20.1	16.3	36.0
HPG-3400SD/RS	16	6.3	42	16.6	51	20.1	16.4	36.2
WPS-3000 (SL. RS. FC)	36	14.2	42	16.6	51	20.1	19	42

Component	Height		Width		Depth		Weight	
WPS-3000 (TPL. TSL. TRS. TFC)	36	14.2	42	16.6	51	20.1	24	53
ACC-3000(T)	36	14.2	42	16.6	51	20.1	19 (24)	42 (53)
TCC-3000SD/RS	19	7.5	42	16.6	51	20.1	≤13.0	≤28
TCC-3000SD/RS w/ 2 valves	19	7.5	52	20.5	51	20.1	≤14.0	≤30,9
VWD-3x00(RS)	16	6.3	42	16.6	51	20.1	14.0	30.9
MWD-3000(RS)	16	6.3	42	16.6	51	20.1	17.0	37.5
DAD-3000(RS)	16	6.3	42	16.6	51	20.1	17.0	37.5
FLD-3x00(RS)	16	6.3	42	16.6	51	20.1	18.0	39.7
RefractoMax 521 RI	15	5.9	26	10.1	45	17.7	12	27
Corona Veo (RS)	22.9	9	44.5	17.5	55.9	22	15	33
ECD-3000RS	16	6.3	42	16.6	51	20.1	13	28
AFC-3000	43	16.5	34	13.4	46	18.1	8.0	17.7

Tip: If you are integrating your UltiMate 3000 LC system with a mass spectrometer, please refer to the *Preinstallation Requirements Guide* of your mass spectrometer for information on its space and load requirements.

2.3 Telephone

Install a telephone in your laboratory near the instrument so that, if necessary, you can conveniently operate the system while you are talking with the Technical Support for Thermo Scientific products by telephone. Place the voice telephone outlet within 2 m (6 ft.) of your system.

Important: Your instrument is designed to work in a controlled electromagnetic environment. Do not use radio frequency transmitters, such as mobile phones, in close proximity to the instrument.

3 Operating Environment

Attention to the operating environment will ensure continued high performance of your UltiMate 3000 LC system. Any expenditure for air conditioning is more than offset by good sample throughput and reduced repair costs.

You are responsible for providing the operating environment necessary for proper operation of the UltiMate 3000 LC system.

3.1 Temperature

The laboratory room temperature must be maintained between 10 °C and 30 °C (50 °F and 86 °F) and temperature fluctuations should be minimized. Temperature fluctuations of more than ±5 °C can adversely affect the chromatographic performance.

For precision instruments such as the UltiMate 3000 DAD Detector, the temperature stability of the environment where the instrument is installed can affect performance.

⚠ **Important:** As the laboratory temperature increases, system reliability decreases. All electronic components generate heat while operating. For the components to continue to operate reliably, ensure that this heat is released into the surrounding air.

Circulation of air around the system must be ensured, the air conditioning system must be capable of maintaining a constant temperature in the immediate vicinity of the system.

⚠ **Important:** Do not place the UltiMate 3000 LC system under an air duct, near windows, or near heating or cooling sources.

The air conditioning load for a typical UltiMate 3000 LC system—pump, thermostatted autosampler, thermostatted column compartment, and detector—with a data system is approximately 530 Watt (1810 BTU/h). Table 3 shows the approximate typical heat output of each module.

🛈 **Tip:** The heat output is specified for typical operation mode. The heat output might differ from these values depending on the actual operation (e.g. heating, cooling, etc.).

The heat output might deviate from given values if additional features (e.g. PCM-3000) are installed.

Table 5: Typical heat output for an the modules of an UltiMate 3000 system and the data system with printer.

Components	**Heat output (in Watt)**	**Heat output (in BTU/h)**
UltiMate 3000 Solvent Racks		
SRD-3x00	10	50
UltiMate 3000 Pumps		
ISO-3100SD	25	100
ISO-3100BM	25	100
LPG-3400(RS)	30	125
HPG-3x00(RS)	40	150
HPG-3400BX	25	100
DGP-3x00(RS)	40	150
UltiMate 3000 Autosamplers		
WPS-3000 xx (RS)	25	100
ACC-3000	30	125
UltiMate 3000 Thermostatted Autosamplers		
WPS-3000Txx (RS)	95	325
ACC-3000T	110	400
UltiMate 3000 Thermostatted Column Compartments		
TCC-3000(RS)	50	175
UltiMate 3000 Optical Detectors		
VWD-3x00(RS)	65	225
MWD-3x00(RS), DAD-3000(RS)	85	300
FLD-3x00(RS)	45	175
Charged Aerosol Detector		
Corona Veo (RS)	65	225
Electrochemical Detector		
ECD-3000RS	20	75
Refractive Index Detector		
RefractoMax 521	15	75
UltiMate 3000 Automated Fraction Collector		
AFC-3000	30	125
UltiMate 3000 Nano Cap Systems		

Components	Heat output (in Watt)	Heat output (in BTU/h)
NCP-3200RS	65	225
NCS-3500RS	90	325
Computer*	80	250
Monitor*	30	100
Laser Printer*	50	170

* Approximate. The actual values depend on your equipment.

3.2 Humidity

Maintain the relative humidity of the operating environment between 5 % and 80 %, with no condensation.

Operating an UltiMate 3000 LC system in an environment with very low humidity can cause static electricity to accumulate and discharge, which can shorten the life of the electronic components. Operating the system in an environment with high humidity can cause condensation, oxidation, and short circuits. It can also cause dust to accumulate, which can block filters on cooling fans.

To ensure that your laboratory is always within the required temperature and humidity specifications, Thermo Fisher Scientific recommends that you equip your laboratory with a temperature/humidity monitor.

3.3 Vibration

Keep floors free of vibration caused, for example, by nearby equipment.

3.4 Lighting

For comfort and safety in performing LC system operations, make sure that your laboratory provides excellent lighting.

3.5 Particulate Matter

Ensure that the air in your laboratory is free from excessive dust, smoke, or other particulate matter in excess of 5 µm, that is less than 3,500,000 particles per cubic meter (100,000 particles per cubic foot).

Dust can clog the air filters, which causes reduced airflow around electronic components. Dust on electronic components can act as an insulating blanket, which reduces the transfer of heat from the components to the surrounding air.

3.6 Electrostatic Discharge

Electrostatic discharge (ESD) can damage the electronic components of your UltiMate 3000 LC system.

The discharge of static electricity is not perceptible to humans until the potential is at least 4000 V. However, a discharge of electrostatic potential as small as 50 V can damage many electronic components. ESD damage can cause your system to cease functioning in the worst case. More commonly, ESD damage may cause latent problems that damage sensitive electrical components, causing premature failures.

The modules of your UltiMate 3000 LC system are designed to withstand electrostatic discharges up to 4 kV (air discharge) and 4 kV (contact discharge) with all panels in place. However, removing the panels and handling the PCBs without proper precautions might damage the electrical components or cause them to fail prematurely.

Static electricity can develop in a variety of ways. Some examples follow:

- Walking across a carpet in a room that is at 20 % relative humidity can generate as much as 35,000 V of electrostatic potential on the surface of your body. A similar walk in a room at 80 % relative humidity generates about 1,500 V of electrostatic potential.
- Sitting and working in a chair padded with polyurethane foam in a room at 20 % relative humidity can cause as much as 18,000 V of electrostatic potential to develop on your skin. At 80 % relative humidity, the electrostatic potential can be as much as 1,500 V.
- Working in a laboratory coat and clothing made of synthetic fibers can cause static electricity to accumulate on your skin.
- Using Styrofoam™ cups and packing materials results in a considerable electrostatic charge.

Because of ESD, Thermo Fisher Scientific recommends the following precautions, especially when operating your system at the lower end of the relative humidity specification:

- Use a static-dissipating floor covering (such as tile or conductive linoleum) in the room that houses your instrument.
- Use laboratory chairs covered with natural fibers or other static-dissipating material.
- Wear a laboratory coat and clothing made of natural fiber or other static-dissipating material when you are operating the instrument.
- Keep Styrofoam cups or packing materials away from the instrument.

3.7 Gas Supply

For the operation of Corona charged aerosol detectors, nitrogen is required that is dry (no water vapor), clean and free of micro-particles (< 0.1µm).

Nitrogen gas from a liquid nitrogen source (medical grade) is satisfactory. However, it is highly recommended to filter the gas through a submicron particle filter before entering the

detector. Not using a well-filtered operating gas supply, may affect the performance of the detector.

If you have purchased a nitrogen generator from Thermo Fisher Scientific, a compressed air source is required that supplies at least a pressure of 80 psi in order to operate one detector. We recommend using:

- A Nitrogen Generator for charged aerosol detectors (Part No.: 6295.0200) if compressed air is available in the laboratory only. The nitrogen generator accepts the same gas supply connections as the Corona charged aerosol detectors.
- An Inlet Gas Conditioning Module for charged aerosol detectors (Part No.: 70-8285).

Tip: If a suitable compressed air source is not available in the laboratory, you can purchase a suitable compressor with your instrument.

Please contact your local Thermo Fisher Scientific sales representative for more information.

Important:

For the operation of a Corona Veo (RS) detector, the gas supply pressure must be between 0.48 – 0.55 MPa (70 – 80 psi). Supply pressure(s) outside the specification may result in reduced performance and void the warranty.

Tip: The gas consumption of the Corona charged aerosol detectors is approximately 4 L/min.

Corona charged aerosol detectors are compatible with gas supply tubing with the following specification: 3/16" ID x 1/4" OD.

Approximately 5 feet of compatible perfluoroalkoxy tubing with a pressure rating of 1.2 MPa (175 psi) ships with each detector.

Please contact your local Thermo Fisher Scientific representative to order custom lengths for installation.

4 Line Power

The quality of line power delivered to your system can affect its performance and lifetime. To ensure that your instrument performs optimally and is not damaged by power line fluctuations, verify that your laboratory electrical supply complies with all power quality requirements.

You are responsible for providing a power source of acceptable quality to operate your system.

4.1 Quality of Power

The quality of power supplied to your UltiMate 3000 LC system is very important. The line voltage must be stable and within the specifications listed in this guide. The line voltage must be free of fluctuations due to slow changes in the average voltage, surges, sags, or transients.

Table 6 contains definitions for the three most common voltage disturbances.

Table 6: Common voltage disturbances.

Voltage disturbance	Definition
Slow average	A gradual, long-term change in average root mean square (RMS) voltage level, with typical durations greater than 2 seconds
Sags and surges	Sudden changes in average RMS voltage level, with typical durations between 50 microseconds and 2 seconds
Transients or impulses	Brief voltage excursions of up to several thousand volts with durations up to 50 microseconds

Constant high line voltage, impulses, or surges in voltage can cause overheating and component failures. Constant low line voltage or sags in voltage can cause the system to function erratically or not at all. Transients, even a few microseconds in duration, can cause electronic devices to fail catastrophically or to degrade and eventually shorten the lifetime of your system. For these reasons, it is important that you establish the quality of the line voltage in your laboratory before installing an UltiMate 3000 LC system.

4.2 Power Monitoring Devices

Monitor the quality of your line power with a power-line disturbance analyzer. This type of device provides a continuous record of line performance by analyzing and printing out information on three types of voltage disturbances: slow average, sag and surge, and transient. The Dranetz™ power-line disturbance analyzer is a device capable of detecting and recording most types of line power problems. You can rent power-line analyzers from electrical equipment suppliers.

Monitor the power-line 24 hours a day, for seven consecutive days. If inspection of the printout indicates disturbances, take corrective action.

4.3 Power Conditioning Devices

You can correct a line voltage problem using various line voltage conditioning devices. If you have good regulation but the power line disturbance analyzer shows transient voltages, then an isolation/noise-suppression transformer can resolve the problem. If there are both transient and regulation problems, consider power conditioners that can control these problems.

When the line voltage is free from voltage sags, surges, and impulses but is more than 10 % outside of the voltage specifications, a buck/boost transformer can lower (buck 10 %) or raise (boost 10 %) the line voltage.

The buck/boost transformer is encased in a metal housing approximately 13 × 13 × 26 cm (5 × 5 × 10 in.) and is equipped with a 2 m (6 ft) power cable. To order a buck/boost transformer kit, contact Thermo Fisher Scientific, and have your electrician install the buck/boost transformer before a field service engineer installs your LC system. The installation instructions for the transformer are included in the kit.

⚠ **Caution:** For compliance and safety, recognized domestic and international organizations (for example, UL, CSA, TUV, and VDE) must certify your uninterruptible power supply (UPS) devices.

Thermo Fisher Scientific does not endorse any power monitoring company, nor does it endorse products other than its own. Companies and products listed in this guide are given as examples only.

4.4 Available Outlets

All UltiMate 3000 modules are equipped with auto-ranging power modules and can operate within the range of 100 V to 240 V, 50/60 Hz. The UltiMate 3000 SRD-3x00 is powered through the pump (HPG and DGP-type pumps only) or optionally by a separate power supply.

The minimum and maximum voltage tolerances are in accordance with EN60950-1:2001, as follows:

“If the equipment is intended for direct connection to the AC mains supply, the tolerances on rated voltage shall be taken as +6 % and -10 % unless the rated voltage is 230 V single phase or 400 V three-phase, in which case the tolerance shall be taken as +10 % and -10 %.”

For systems installed in regions with 115 V AC service only, the basic power requirements for an UltiMate 3000 LC system with computer, monitor, and printer consist of the following:

- Nominal voltage of 115 V AC and 230 V AC
- Frequency of 50/60 Hz

- Two fourplex outlets (single-phase power) with a minimum power rating of 10 A (115 V AC)
- Earth ground hard-wired to the main panel

For systems installed in areas with 230 V AC service only, the basic power requirements for an UltiMate 3000 LC system consist of the following:

- Nominal voltage of 230 V AC
- Frequency of 50/60 Hz
- Two fourplex outlets, with a minimum power rating of 10 A at each fourplex outlet
- Earth ground hard-wired to the main panel

⚠ **Important:** The UltiMate 3000 LC system, including the data system hardware, must have a common ground. The interconnected power outlets for the UltiMate 3000 LC system must have a common point to one ground connector. Connecting the modules of the UltiMate 3000 LC system to external grounds at different potentials can create a ground loop that causes noise and interference.

⚠ **Caution:** Improper grounding of the UltiMate 3000 LC system creates an electrical safety hazard.

Tip: Additional power outlets might be required for test and cleaning equipment, such as an ultrasonic bath. Thermo Fisher Scientific recommends that there be several additional power outlets close to the workbench space within your laboratory.

Table 7 shows the maximum current required by each component of a typical UltiMate 3000 LC system. The components are equipped with a switching power supply to support both, 115 V AC and 230 V AC environments.

Table 7:Maximum current (single phase) drawn from an LC system at 115 V or 230 V AC, and the data system (with printer) at 115 V or 230 V AC.

Module	**Voltage 115 V AC**	**Voltage 230 V AC**
	Maximum current drawn	**Maximum current drawn**
System	5.2 A	2.8 A
System Thermostatted Autosampler	6.7 A	3.5 A
Monitor*	2 A	1 A
Computer*	4 A	2 A
Laser printer*	3 A	2 A

*Approximate. The actual value depends on your equipment.

⚠ **Tip:** The values listed in Table 7 are the average currents drawn by each of the listed components. Contact your field service engineer for more information.

Before you install an UltiMate 3000 LC system, plan your power system. Refer to Table 8 for an example of the number of outlets that your laboratory might require for a proper supply of your UltiMate 3000 LC system.

Table 8: Required number of outlets for a sample laboratory setup.

Item	Outlets
HPLC System	
UltiMate Solvent Racks (with external power supply)	0 (1)
Pumps	1
Autosamplers	1
Thermostatted Column Compartments	1
Detectors*	1
Data system	
CPU	1
Monitor	1
Printer	1
Total outlets required for this configuration*	**7-9**

Your setup might vary and depends upon the line voltages and current supplied.

* Multiple detectors will require multiple outlets.

4.5 Connecting to Socket-Outlets

⚠ **Caution:** Never connect a mass spectrometer and an UltiMate 3000 LC system to the same electrical socket-outlet circuit.

Tip: The power specifications for the modules in your system might vary from those in this guide.

Table 9: Maximum current drawn from a 115 V AC fourplex outlet.

	Module Outlet #1 115 V AC	Outlet #2 115 V AC
	Maximum current drawn	**Maximum current drawn**
Pump	1.3 A	
Autosampler	1.3 A	
Thermostatted Autosampler	2.8 A	
Column Compartment	1.3 A	
Detector	1.3 A	

	Module Outlet #1 115 V AC	**Outlet #2 115 V AC**
Monitor		2 A
Computer		4 A
Laser printer		3 A

Table 10: Maximum current drawn from a 230 V AC fourplex outlet.

	Module Outlet #1 230 V AC	**Outlet #2 230 V AC**
	Maximum current drawn	**Maximum current drawn**
Pump	0.7 A	
Autosampler	0.7 A	
Thermostatted Autosampler	1.4 A	
Column Compartment	0.7 A	
Detector	0.7 A	
Monitor		1 A
Computer		2 A
Laser printer		2 A

The power-supply cables for the modules of the UltiMate 3000 LC system are 2 m (6 ft.) and the cables from the personal computer, monitor, and printer are approximately 2 m (6 ft.) long.

Tip: Power cords are not included in the shipment of the UltiMate 3000 modules. The power supply cables have to be ordered separately according to the shipping destination. The power cord is added to the shipment free of charge if it is ordered with a module.

Table 11: Power cords according to country standards.

Destination	**Plug type**	**Voltage rating**	**Current rating**	**P/N**
EU	CEE 7/7	250 V AC	10 A	6000.1000
United States and Canada	NEMA 5-15P	125 V AC	10 A	6000.1001
United Kingdom	BS 1363	250 V AC	5 A	6000.1020
Switzerland	SEV 1011	250 V AC	10 A	6000.1030
Italy	CEI 23-16-VII	250 V AC	10 A	6000.1040
Japan	NEMA-5-15	125 V AC	7 A	6000.1050
Australia	AS-3112	250 V AC	10 A	6000.1060
Denmark	DS 60884-2-D1	250 V AC	6 A	6000.1070
China	C13	250 V AC	10 A	6000.1080

Warning: Never use a power cord other than the power cords provided for the device.

Do not use multiple sockets or extension cords. Using defective multiple sockets or extension cords may cause personal injury or damage to the device.

Avertissement: Utilisez uniquement les cordons d'alimentation électrique spécifique à l'instrument.

N'utilisez pas des blocs multiprise ou des câbles prolongateurs. Cela pourrait entraîner des blessures corporelles ou endommager l'instrument.

4.6 Uninterruptible Power Supply

If your local area is susceptible to corrupted power or power disruptions, then install an Uninterruptible Power Supply (UPS) in your laboratory.

Caution: For compliance and safety, your uninterruptible power supply (UPS) devices must be certified by recognized domestic and international organizations (for example, UL, CSA, TUV, and VDE).

4.7 Technical Assistance

Occasionally, you might encounter line power sources of unacceptable quality that adversely affect the operation of an UltiMate 3000 LC system. Correcting line power problems is your responsibility. Contact your local office for Thermo Scientific products for assistance in monitoring the line voltage in your laboratory and in selecting a line conditioner.

Specifying power-conditioning equipment is a complex task that is best handled by a company or consultant specializing in that field. Contact your local Thermo Fisher Scientific office for assistance in locating a power consultant in your area.

5 Waste and Ventilation

5.1 General

The waste and exhaust arrangements for your UltiMate 3000 LC system can affect the proper performance of the system. Solvent wastes must be collected and disposed properly.

It is in your responsibility to provide the proper waste and ventilation systems that are required to operate your LC system.

To provide drainage and prevent solvent from leaking into the UltiMate 3000 system modules, the accessories kits for the pumps contain the drain tubing to connect the drainage ports on the right side of the UltiMate 3000 modules to waste.

The total amount of liquid waste, including the maximum total flow rate and drainage waste for the UltiMate 3000 pumps is listed in Table 12.

Table 12: Amount of liquid waste of an UltiMate 3000 system (approximate values).

Model	
SD pump modules	Flow: up to 10 mL/min (20 mL/min for DGP variant), additionally: rear seal wash solution waste
RS pump modules	Flow: up to 8 mL/min (16 mL/min for DGP variant) , additionally: rear seal wash solution waste
Autosamplers	Wash and condensation waste
All modules	Drain liquid in case of leakage or spilling

⚠ **Important:** Thermo Fisher Scientific recommends that the waste container is placed in a secondary containment vessel large enough to hold 5 liters of liquid.

In addition to providing a proper waste collection and disposal system, you must also ensure that your laboratory is vented adequately to prevent the buildup of solvent fumes.

5.2 Charged Aerosol Detectors

5.2.1 Ventilation Requirements

Exhaust gases (including carrier gas, vaporized eluent and solute micro particles) exit from the instrument through an external vent. This gas outlet is located on the rear panel of the instrument. It must be connected to a fume hood or a similar venting device with the plastic tubing (20 mm diameter) included in the accessories kit. The exhaust may contain volatile organic compounds (VOCs) in low concentration. For safety reasons, it is essential that the detector is vented properly.

⚠ **Important:** Ventilation should be at atmospheric pressure with no vacuum or negative pressure applied. A vacuum may cause depressurization

inside the detector, creating turbulence and disrupting the instrument stability.

5.2.2 Drain Connections

Charged Aerosol detectors use a dual drain / vent tube that is located on the side of the instrument. It is necessary to connect this drain / vent tube to the waste vessel to collect any condensed liquid.

⚠ **Important:** The tubing and the waste container connected to the drain / vent on the side of the instrument must both be entirely below the waste exit port on the front of the instrument or performance may be affected. Please refer to the *Operating manual* of the charged aerosol detector for more information.

Tip: Thermo Fisher Scientific recommends placing the waste bottle in a secondary containment vessel large enough to hold 5 liters of liquid.

6 Solvents

You are responsible for providing the high purity solvents that are required to operate the UltiMate 3000 LC system.

We recommend the use of HPLC- or LC/MS-grade solvents and additives only.

The installation of an UltiMate 3000 LC system requires HPLC-grade methanol and water. If you are using the UltiMate 3000 LC system as the inlet to a mass spectrometer, always use LC/MS-grade solvents.

Tip: Do not filter solvents. Filtering solvents can introduce contamination.

Store and handle all chemicals in accordance with standard safety procedures.

HPLC and LC/MS grade water and methanol are available from Thermo Fisher Scientific www.fishersci.com.

7 Installation

Prior to installation of the UltiMate 3000 LC system, make sure to complete all preparations described in the previous chapters.

After you have completed your laboratory site preparation, return the completed pre-installation letter by email to your Customer Experience Specialist/Installation Coordinator to continue scheduling your installation.

7.1 Installation Kits

Each UltiMate 3000 module ships with communication cables and tools specific for the module. A Viper capillary kit for the fluidic connection of the modules is shipped with each UltiMate 3000 pump.

7.2 Installation

When your new UltiMate 3000 LC system is on site and it is ready for installation, a field service engineer will install it.

Tip: You are responsible for replacing any consumables used during the installation.

During the installation, the field service engineer will do the following:

- Install the equipment
- Perform a system functionality test / Installation Qualification (IQ)
- If purchased, perform an Operational Qualification (OQ)
- Perform instrument familiarization, demonstrating the basics of equipment operation and routine maintenance. Familiarization is intended to enable a customer to run a basic sample analysis and obtain meaningful results.

Tip: To receive maximum benefit from this on-site orientation opportunity, plan for the instrument operator to be available during the entire installation process.

Tip: Additional training courses are available to learn further aspects of instrument and software operation. Please contact your Thermo Fisher Scientific representative for further details.

Important: Do not use your new system for sample analysis until the field service engineer has completed the installation and you have signed the Acceptance Form.

7.3 Preventive Maintenance

You are responsible for the routine and preventive maintenance of the UltiMate 3000 LC system and the data system computer.

Regular preventive maintenance is essential. It increases the lifetime of the system, maximizes the uptime of your system, and provides you with optimum system performance. Maintenance techniques are covered in the *Operating Instructions* of the respective module.

Thermo Fisher Scientific provides a variety of service coverage agreements to cover all service activities including preventive maintenance. Contact your local Thermo Fisher Scientific subsidiary or office for details.

8 Instrument Shipments

All electrical and mechanical components of the system are carefully tested before the instruments are shipped from the factory.

Forwarding companies specialized in the handling of electronic equipment and delicate machinery ship the UltiMate 3000 LC system to your site. However, equipment is occasionally damaged in transit.

Take the following precautions when receiving equipment, supplies, or material:

- Check carefully for obvious damage or evidence of rough handling.
- Note any apparent external damage on all copies of the receiving documents and describe briefly the extent of the damage. Have the driver sign (or initial) next to your comments to signify agreement with your observations.

Tips: Immediately report any shipping damage to both, the incoming carrier and Thermo Fisher Scientific. Shipping insurance will compensate for the damage only if reported immediately.

Freight insurance requires that obvious damage is noted on the receiving documents.

Keep the original shipping container and packing material. They provide excellent protection for the instrument in case of future transit. Shipping the unit in any other packaging automatically voids the product warranty.

Instruments are shipped by one of the following methods:

- Ex Works (EXW) Germering, Germany
- Cost Insurance Freight (CIF) destination
- Cost and Freight (CFR) destination

If the system is damaged in transit, the method of shipment determines who has responsibility for filing a claim against the carrier. If the instrument shipping container, Shock Watch, or other indicators show any evidence of damage or mishandling during shipment, do NOT open the container. Call your Thermo Fisher Scientific representative for further instructions.

Most systems are shipped EXW Germering, and any damage incurred in shipment is the responsibility of the purchaser and the carrier. However, Thermo Fisher Scientific will assist with claims filing and (billable) repairs if necessary.

If the system is shipped CIF or CFR destination and is damaged, Thermo Fisher Scientific files a claim against the carrier. In this case, please contact: orders.dionex.deger@thermofisher.com.

Tip: Thermo Fisher Scientific does not accept liability for damage if materials are received with obvious damage AND the damage is not recorded on the receiving documents.

When your system arrives, move it to a protected location indoors. If you have questions about moving your system, contact your local office for Thermo Scientific products.

9 Regulatory Compliance

Thermo Fisher Scientific performs complete testing and evaluation of its products to ensure full compliance with applicable domestic and international regulations. When the system is delivered to you, it meets all pertinent electromagnetic compatibility (EMC) and safety standards as described in the next section or sections by product name.

Changes that you make to your system may void compliance with one or more of these EMC and safety standards. Changes to your system include replacing a part or adding components, options, or peripherals not specifically authorized and qualified by Thermo Fisher Scientific. To ensure continued compliance with EMC and safety standards, replacement parts and additional components, options, and peripherals must be ordered from Thermo Fisher Scientific or one of its authorized representatives.

UltiMate 3000 Solvent Racks with Degasser, Pumps, Wellplate Autosamplers, Thermostatted Column Compartments, Optical and Electrochemical Detectors, Automated Fraction Collector and Dionex Charged Aerosol Detectors

Thermo Fisher Scientific herewith declares conformity of the above products with the respective requirements of the following regulations:

- Machinery Directive 2006/42/EC
- EMC Directive 2004/108/EC

The safety of the machinery was evaluated based on the following standard:

- EN ISO 12100:2010
  Safety of machinery - General principles for design Risk assessment and risk reduction

The electrical safety of the products was evaluated based on the following standard:

- DIN EN 61010-1: 2002
  Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1: General Requirements

The Electromagnetic Compatibility (EMC) of the products was evaluated based on the following standard:

- DIN EN 61326: 2006
  Electrical equipment for measurement, control and laboratory use

EMC Requirements

- The protection requirements specified in the low-voltage directive 2006/95/EC are met.

Low Voltage Safety Compliance

Low Voltage Safety Compliance has been evaluated by TUV Rheinland of North America, Inc.

- UL61010-1:2004

  Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements

- CAN/CSA-C22.2 No. 61010-1:2004

  Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements

ERC RefractoMax 521 Refractive Index Detector

CE declaration covers the respective requirements of the following regulations:

- Low Voltage Directive 2006/95/EC
- Machinery Directive 2006/42/EC
- EMC Directive 2004/108/EC

The safety of the machinery and the electrical safety of products were evaluated based on the following standard:

- IEC 61010-1:2010 (3rd edition)
- EN 61010-1:2010 (3rd edition)

  Safety requirements for electrical equipment for measurement, control and laboratory use part 1: General requirements

The Electromagnetic Compatibility (EMC) of the products was evaluated based on the following standard:

- EN 61326-1:2006
- EN 61326-2-1:2006

Find more information about the CE conformity in the instruments' *Operating Instructions*.

Responsible for the technical CE documentation is the manufacturer.

For manufacturing location, see the label on the instrument.

10 Index

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