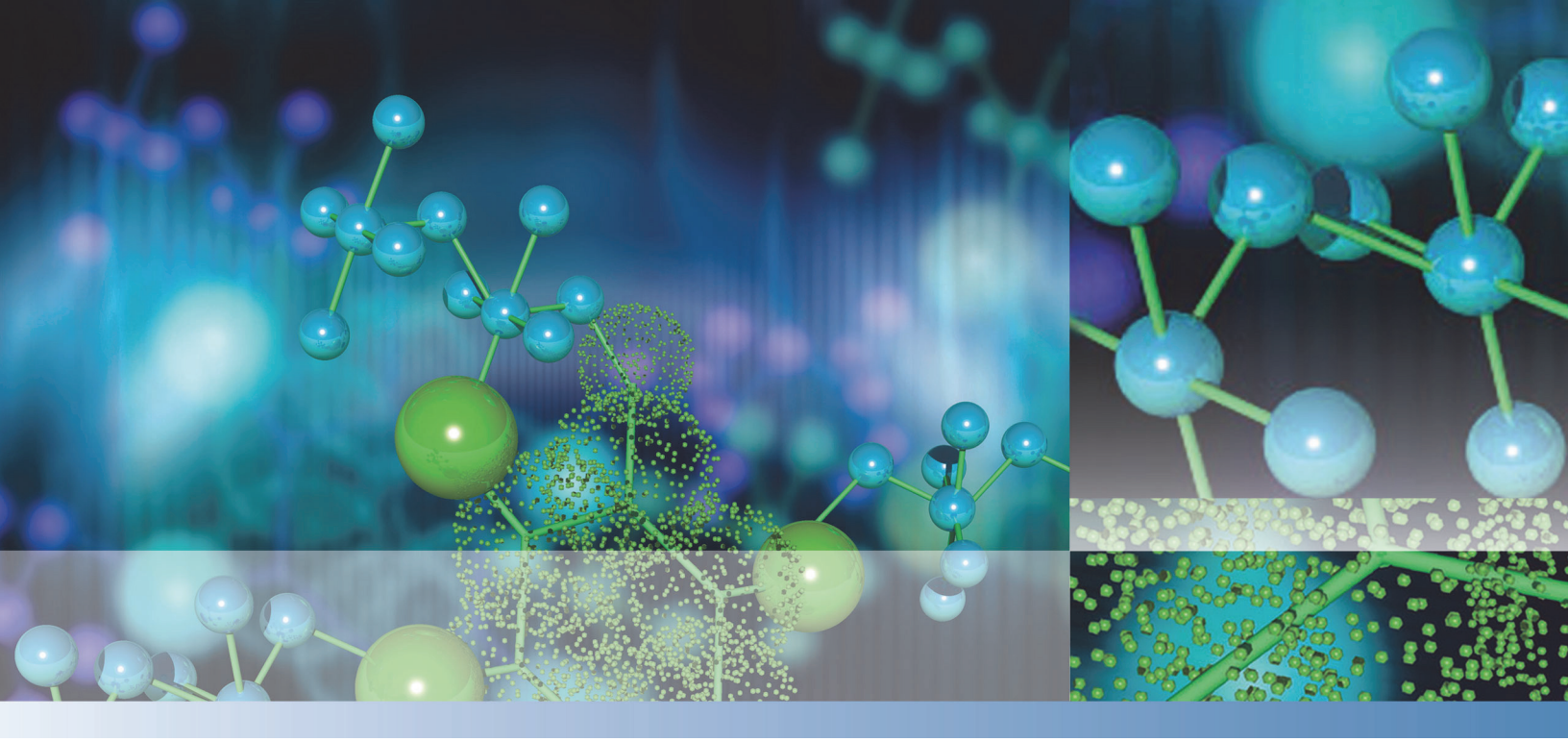

Thermo

EASY-nLC Series

Preinstallation Requirements Guide

60053-97226 Revision G November 2013

Thermo SCIENTIFIC

Revision History: Revision A, June 2011; Revision B, July 2011; Revision C, October 2011; Revision D, January 2012; Revision E, July 2012, Revision F, January 2013; Revision G, November 2013

Hardware versions: EASY-nLC II and EASY-nLC 1000 instruments

For Research Use Only. Not for use in diagnostic procedures.

IMPORTANT PREINSTALLATION INFORMATION... PLEASE READ

Thermo SCIENTIFIC

EASY-nLC Installation Request Form

Dear User:

Read the *EASY-nLC Series Preinstallation Requirements Guide*, and then print and complete the following installation request form. After all items on the form are fulfilled, sign and date the form. Then, mail or fax this form to your local Thermo Fisher Scientific sales/service office. The address and fax number for your local office are located on the following pages.

❑ 1. All laboratory remodeling has been completed.

❑ 2. Your EASY-nLC instrument is on site.

❑ 3. Principal operator will be available during the installation/certification period.

❑ 4. Sufficient bench space is available for all of the equipment. List the following:

Width: _____

Depth: _____

Height: _____

❑ 5. Workbench can support four times the weight of the instrument and is free from vibration.

EASY-nLC II	32 kg (70.4 lb)
EASY-nLC 1000	35 kg (77.0 lb)

❑ 6. Lighting is adequate.

❑ 7. Main power is installed and is in compliance with local electrical codes.

❑ 8. Power for test and cleaning equipment is installed.

❑ 9. Power outlets are of the correct configuration. Note NEMA type: _____

❑ 10. Voltage of power outlet has been measured. Note ***measured*** voltage: _____

❑ 11. Power is free from fluctuations due to slow changes in the average voltage or changes due to surges, sags, or transients.

❑ 12. Air conditioning is adequate for temperature, humidity, and particulate matter control. The laboratory can be maintained at a constant temperature, between 5 and 30 °C (41 and 86 °F).

❑ 13. Relative humidity is between 20 and 80% with no condensation.

❑ 14. Instrument work area is free from magnetic disruption and electrostatic discharge.

❑ 15. LC/MS-grade water, acetonitrile, and formic acid, are available for testing the performance of your LC/MS system.

For best results, order the following solvent blends from Thermo Fisher Scientific:

- LC/MS-grade 0.1% formic acid in water
- LC/MS-grade 0.1% formic acid in acetonitrile

❑ 16. Provision has been made for collecting the solvent waste.

❑ 17. One voice telephone line is installed near the LC/MS system.

❑ 18. One network connection is installed near the instrument. The network firewall must allow outgoing TCP/IP traffic from the EASY-nLC instrument to the remote support server at IP address 195.41.108.93, port 22.

❑ 19. An appropriate MS detector with a nanospray ion source is installed near the instrument.

❑ 20. All relevant safety regulations are complied with.

Have any special acceptance specifications been agreed to in the contract? Yes ❑ No ❑
If **YES**, attach full details of specifications.

Is there any additional equipment that needs to be interfaced to the instrument? Yes ❑ No ❑
If **YES**, attach full details of additional equipment.

Note: We reserve the right to invoice against the engineer's time if the installation requirements are not met on the date of the installation.

EASY-nLC Information Request Form (continued)

Print your name, company name, and company address clearly below:

Name _____

Company _____ Telephone_____

Address _____

Address _____

City _____ State _____ Country_____

Signature _____ Date _____

Note After receiving this checklist, your local field service representative will contact you to schedule installation.

Chromatography and Mass Spectrometry Offices

For up-to-date contact information, visit www.thermoscientific.com/wps/portal/ts/contactus.

North America

United States

1400 North Point Pkwy #10
West Palm Beach, FL 33407
E-mail:
us.customer-support.analyze@thermofisher.com
Phone.....[1] 800 532 4752
Fax .....[1] 877 373 4006

Canada

2845 Argentia Road, Unit 4
Mississauga, Ontario, L5N 8G6
E-mail:
us.customer-support.analyze@thermofisher.com
Phone.....[1] 800 530 8447
Fax .....[1] (905) 890 9161

Europe

Austria

Wehlistrasse 27b
A-1200 Wien
E-mail: service.sid.austria@thermofisher.com
Phone.....[43] (0) 1 333 50 34-0
Fax .....[43] (0) 1 333 50 34-26

Belgium

Clintonpark “Keppekouter”
Ninovesteenweg 198
B-9320 ERMEBODEGEM - AALST
E-mail: service.sid.benelux@thermofisher.com
Phone.....[32] (0) 2 482 3030
Fax .....[32] (0) 2 482 3031

Denmark

Fruebjergvej 3
2100 København Ø
E-mail: service.sid.dk@thermofisher.com
Phone.....[45] (70) 236267
Fax .....[45] (70) 236263

Finland—*see* “Sweden, Norway, and Finland”

France

(Also representing French-speaking North Africa, Algeria, Morocco, and Tunisia)

16 Avenue du Québec
Silic 765
Z.A. de Courtaboeuf
F-91963 Les Ulis Cédex
E-mail: service.sid.lesulis@thermofisher.com
Phone.....[33] (0) 1 60 92 49 50
Fax .....[33] (0) 1 60 92 48 99

Germany

Im Steingrund 4-6
D-63303 Dreieich
E-mail: service.dreieich@thermofisher.com
Phone.....[49] (0) 6103 408 1050
Fax .....[49] (0) 6103 408 1213

Italy

Strada Rivoltana
I-20090 Rodano (Milano)
E-mail: assistenza.tecnica.it@thermofisher.com
Phone.....Numero Verde (800) 823 162
Fax .....[39] (02) 95320 225

Netherlands

Takkebijsters 1
NL-4817 BL Breda
E-mail: service.sid.benelux@thermofisher.com
Phone.....[31] (0) 76 579 55 55
Fax .....[31] (0) 76 581 09 61

Norway—*see* “Sweden, Norway, and Finland”

Spain

C/Valportillo I, n^{o}22 1a Planta
Edificio Caoba
ES-28108 Alcobendas - Madrid
E-mail: service.sid.spain@thermofisher.com
Phone.....[34] (914) 845 965
Fax .....[34] (914) 843 598

Notes: The country code is enclosed in square brackets [ ]. The city code or area code is enclosed in parenthesis ( ).

Chromatography and Mass Spectrometry Offices—Continued

Europe—continued

Sweden, Norway, and Finland

Pyramidbacken 3
S-141 75 Kungens Kurva (Stockholm)
Sweden
E-mail: service.sid.nordic@thermofisher.com
Phone.....[46] (0) 8 556 468 20
Fax.....[46] (0) 8 556 468 08

Switzerland

Neuhofstrasse 11
4153 Reinach
E-mail: service.sid.ch@thermofisher.com
Phone.....[41] (617) 16 77 40
Fax.....[41] (617) 16 77 20

United Kingdom

Stafford House
1 Boundary Park
Boundary Way
Hemel Hempstead
Hertfordshire HP2 7GE
E-mail: service.sid.hemel@thermofisher.com
Phone.....[44] (0) 870 241 1034
Fax.....[44] (0) 1442 233 667

Australasia and Asia

Australia

P.O. Box 9092
5 Caribbean Drive
Scoresby, VIC 3179
E-mail: analyze.au@thermofisher.com
Phone.....[61] 39757 4300
Fax.....[61] 9763 1169

Japan

C-2F
3-9 Moriya-cho, Kanagawa-ku
Yokohama 221-0022
E-mail: analyze.jp@thermofisher.com
Phone.....[81] (45) 453 9100
Fax.....[81] (45) 453 9110

P.R. China

7th Floor, 7F Tower West, Younghe Plaza
No. 28, Andingmen East Street
Beijing 100007
E-mail: analyze.cn@thermofisher.com
Phone (free lines).....800 810 5118
.....400 650 5118
Fax.....[86] 10 88370548

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 instrument 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 instrument might void compliance with one or more of these EMC and safety standards. Changes to your instrument 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.

EASY-nLC instrument

EMC Directive 2004/108/EC

EMC compliance has been evaluated by DELTA Denmark. For further information, refer to the "Declaration of Conformity" in the preface of the *EASY-nLC Series Getting Started Guide*.

Low Voltage Safety Compliance

This device complies with Low Voltage Directive 2006/95/EEC evaluated by Intertek Group plc and harmonized standard EN 61010-1.

FCC Compliance Statement

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

CAUTION Read and understand the various precautionary notes, signs, and symbols contained inside this manual pertaining to the safe use and operation of this product before using the device.

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Notice on Lifting and Handling of Thermo Scientific Instruments

For your safety, and in compliance with international regulations, the physical handling of this Thermo Fisher Scientific instrument ***requires a team effort*** to lift and/or move the instrument. This instrument is too heavy and/or bulky for one person alone to handle safely.

Notice on the Proper Use of Thermo Scientific Instruments

In compliance with international regulations: This instrument must be used in the manner specified by Thermo Fisher Scientific to ensure protections provided by the instrument are not impaired. Deviations from specified instructions on the proper use of the instrument include changes to the system and part replacement. Accordingly, order replacement parts from Thermo Fisher Scientific or one of its authorized representatives.

Notice on the Susceptibility to Electromagnetic Transmissions

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.

For manufacturing location, see the label on the instrument.

WEEE Compliance

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the following symbol:

Thermo Fisher Scientific has contracted with one or more recycling or disposal companies in each European Union (EU) Member State, and these companies should dispose of or recycle this product. See www.thermoscientific.com/rohsweee for further information on Thermo Fisher Scientific's compliance with these Directives and the recyclers in your country.

WEEE Konformität

Dieses Produkt muss die EU Waste Electrical & Electronic Equipment (WEEE) Richtlinie 2002/96/EC erfüllen. Das Produkt ist durch folgendes Symbol gekennzeichnet:

Thermo Fisher Scientific hat Vereinbarungen mit Verwertungs-/Entsorgungsfirmen in allen EU-Mitgliedsstaaten getroffen, damit dieses Produkt durch diese Firmen wiederverwertet oder entsorgt werden kann. Mehr Information über die Einhaltung dieser Anweisungen durch Thermo Fisher Scientific, über die Verwerter, und weitere Hinweise, die nützlich sind, um die Produkte zu identifizieren, die unter diese RoHS Anweisung fallen, finden sie unter www.thermoscientific.com/rohsweee.

Conformité DEEE

Ce produit doit être conforme à la directive européenne (2002/96/EC) des Déchets d'Equipements Electriques et Electroniques (DEEE). Il est marqué par le symbole suivant:

Thermo Fisher Scientific s'est associé avec une ou plusieurs compagnies de recyclage dans chaque état membre de l'union européenne et ce produit devrait être collecté ou recyclé par celles-ci. Davantage d'informations sur la conformité de Thermo Fisher Scientific à ces directives, les recycleurs dans votre pays et les informations sur les produits Thermo Fisher Scientific qui peuvent aider la détection des substances sujettes à la directive RoHS sont disponibles sur www.thermoscientific.com/rohsweee.

Contents

Preface . . . . . **xiii**
Related Documentation xiv
Cautions and Special Notices xv
Contacting Us xvi

Chapter 1 **Introduction** **1**
Meeting the Site Requirements for the EASY-nLC Instrument 1
Laboratory Requirements for the EASY-nLC Instrument 2

Chapter 2 **Site Preparation** **3**
Shipping 3
Placement 4
Telephone 6
Internet Access 6

Chapter 3 **Operating Environment** **9**
Temperature and Humidity 9
Air Conditioning Load 10
Vibration 10
Lighting 10
Particulate Matter 10
Electrostatic Discharge 11

Chapter 4 **Line Power** **13**
Quality of Power 14
Power Monitoring Devices 15
Power Conditioning Devices 15
Electrical Outlets 16
Line Voltage 17
Grounding Requirements 17
Maximum Load Capacity for Each Fourplex Outlet 18
Power Supply Cords 18
Uninterruptible Power Supply 18
Technical Assistance 18

Chapter 5 Waste and Ventilation 19

Chapter 6 Solvents. 21

Chapter 7 Installation 23
Spare Parts. 24
Common Replacement Parts 26
Additional Installation Peripherals. 27
Training 28
Preventive Maintenance 28

Chapter 8 Instrument Arrival 29
Receiving Shipping Packages and Reporting Damage 29
Shipment Methods 30
Domestic Shipments 30
International Shipments 30

Index 31

Preface

This guide describes what you as the customer must do to prepare for the installation of the Thermo Scientific EASY-nLC™ (nanoflow liquid chromatography) instrument. Prior to delivery of the instrument and before making an installation appointment with a Thermo Fisher Scientific field service engineer, use this guide in planning and preparing your laboratory site. Read each topic carefully to ensure that your laboratory is ready for the instrument installation.

Contents

- Related Documentation
- Cautions and Special Notices
- Contacting Us

❖ **To suggest changes to documentation or to Help**

Fill out a reader survey online at www.surveymonkey.com/s/PQM6P62. Thank you in advance for your help.

Related Documentation

In addition to this guide, Thermo Fisher Scientific provides the following documents for the EASY-nLC instrument as PDF files:

- *EASY-nLC Series User Guide for the Xcalibur Data System*
- *EASY-nLC Series Getting Started Guide (for the touch-screen software)*
- *EASY-nLC Series Troubleshooting and Maintenance Guide*
- *Safety and Regulatory Guide*

  The EASY-nLC instrument also ships with a printed copy of the *Safety and Regulatory Guide*. This guide contains important safety information about Thermo Scientific™ liquid chromatography (LC) and mass spectrometry (MS) systems. Make sure that all lab personnel have read and have access to this document.

You can find the EASY-nLC Series manuals in the following locations:

- On the USB flash drive provided in the EASY-nLC accessory kit
- On the Thermo Scientific Customer Manuals Web Site
- On the data system computer

❖ To view the product manuals on the data system computer

Choose **Start > All Programs > Thermo Instruments > Manuals > LC Devices > Thermo**.

❖ To view the EASY-nLC Help

- From the EASY-nLC view of the Instrument Setup window, choose **Help > Thermo EASY-nLC Help** to open the Help to the Welcome topic.
- To view the Help topic for the current view, page, or dialog box, press the F1 key for information about setting parameters. Or, from the EASY-nLC view of the Instrument Setup window, choose **Help > Help On Current Item**.

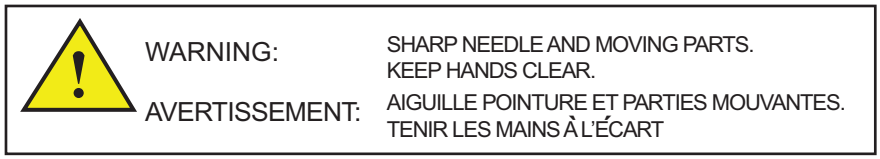
For more information, visit www.thermoscientific.com.

Cautions and Special Notices

Make sure to observe the safety and special notices that appear in boxes.

The following two stickers appear on the EASY-nLC instrument:

- The sticker below warns you that the instrument includes a sharp needle and moving parts that are accessible to the operator. To prevent personal injury or damage to parts of the EASY-nLC instrument, take care when loading samples into the instrument's tray compartment.



- The sticker below alerts you to consult this manual for instructions on how to operate the instrument.

The safety and special notices in this manual include the following:

CAUTION Highlights hazards to humans, property, or the environment. Each CAUTION notice is accompanied by an appropriate CAUTION symbol.

CAUTION Highlights lifting hazards.

IMPORTANT Highlights information necessary to prevent damage to software, loss of data, or invalid test results; or may contain information that is critical for optimal performance of the instrument.

Note Highlights information of general interest.

Tip Highlights helpful information that can make a task easier.

Contacting Us

There are several ways to contact Thermo Fisher Scientific for the information you need.

❖ To contact Technical Support

Phone	(U.S. and Canada) 800-532-4752
Web site	For up-to-date contact information for other locations, go to www.thermoscientific.com/wps/portal/ts/contactus. For ordering information and software downloads, go to www.proxeon.com.
E-mail	(North and South America) us.techsupport.analyze@thermofisher.com (Other continents) eu.techsupport.cmf@thermofisher.com

❖ (U.S. and Canada) To contact Customer Service for ordering information

Phone	800-532-4752
Fax	561-688-8731
E-mail	USPAL.orderprocessing@thermofisher.com
Web site	www.thermoscientific.com

For all other sales and service contacts for Thermo Scientific CMD products, see "Chromatography and Mass Spectrometry Offices" on page v.

❖ To order consumable and spare parts for the EASY-nLC instrument

For the EASY-nLC 1000 instrument, go to www.proxeon.com/productrange/nano_lc_easy-nlc_1000/accessories_spares/index.html.

For the EASY-nLC II instrument, go to www.proxeon.com/productrange/nano_lc/accessories-spares/index.html.

❖ To copy manuals from the Internet

Go to mssupport.thermo.com and click **Customer Manuals** in the left margin of the window.

❖ To suggest changes to documentation or to Help

- Fill out a reader survey online at www.surveymonkey.com/s/PQM6P62.
- Send an e-mail message to the Technical Publications Editor at techpubs-lcms@thermofisher.com.

1

Introduction

This document describes the requirements for the laboratory where you plan to install the EASY-nLC instrument. If you have any questions prior to the installation appointment, contact your local sales representative or our remote support center:

- For North and South America, contact your local sales representative at us.customer-support.analyze@thermofisher.com.
- For all other continents, contact your local sales representative at eu.techsupport.cmf@thermofisher.com.

Contents

- Meeting the Site Requirements for the EASY-nLC Instrument
- Laboratory Requirements for the EASY-nLC Instrument

Meeting the Site Requirements for the EASY-nLC Instrument

To confirm that you have met the site requirements in this document, fill out and forward a signed copy of the Installation Request Form at the beginning of this document.

The EASY-nLC instrument operates reliably under carefully 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 EASY-nLC instrument or maintaining it in a condition outside the 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.

Laboratory Requirements for the EASY-nLC Instrument

Table 1 summarizes the installation requirements for the EASY-nLC II and EASY-nLC 1000 instruments. The EASY-nLC 1000 instrument is slightly larger and heavier than the EASY-nLC II instrument. The solvent, power, and laboratory environment requirements are the same for both instruments.

Table 1. Laboratory requirements

Specification	EASY-nLC II	EASY-nLC 1000
Instrument dimensions		
Width	35 cm (13.8 in.)	36 cm (14.2 in.)
Depth[a]	38 cm (15.1 in.)	38 cm (15.1 in.)
Height[b]	45 cm (17.7 in.)	45 cm (17.7 in.)
Weight[c]	32 kg (70.5 lb)	35 kg (77.2 lb)
Solvents Use only LC/MS-grade solvents with the EASY-nLC instrument. For more information, see Chapter 6, "Solvents."		
Solvent A	0.1% formic acid in water	same
Solvent B	0.1% formic acid in acetonitrile	same
Wash bottle 3	0.1% formic acid in water	same
Power requirements For UPS dimensioning, assume 250 W.		
120 Vac	±10%; 50/60 Hz; 250 VA	same
230 Vac	±10%; 50/60 Hz; 250 VA	same
Note The EASY-nLC instrument and the Thermo Scientific mass spectrometer require one outlet each. The nanospray ion source requires three outlets. The optional data system computer, Ethernet switch, monitor, and printer also require one outlet each. For more information, see Chapter 4, "Line Power."		
Laboratory environment For optimal instrument performance, ensure the following: • The benchtop must be vibration free and well lit. • The air conditioning system must be capable of maintaining a temperature range of 5 to 30 °C with minimum temperature fluctuations and a relative humidity between 20 to 80% with no condensation. • The laboratory air must be free from excessive dust, smoke, or other particulate matter in excess of 5 µm—that is, fewer than 3500000 particles per cubic meter (100000 particles per cubic foot).		

[a] Provide additional space behind the instrument for ventilation and access to the back panel connections.

[b] Provide additional space above the instrument for the solvent bottles.

[c] Ensure that the laboratory benchtop can support four times the system weight.

2

Site Preparation

Before a Thermo Fisher Scientific field service engineer can install the EASY-nLC instrument, you must prepare the site. Supporting the weight of the EASY-nLC instrument, (optional) LC detector, and mass spectrometer requires large and strong workbenches. Each LC/MS system also has specific power requirements. You must install a telephone line and an Internet connection within reach of the workbench.

You are responsible for providing an acceptable installation site.

Contents

- Shipping
- Placement
- Telephone
- Internet Access

Shipping

The EASY-nLC instrument and all auxiliaries ship in a box, which is then placed on a pallet. Table 2 lists the dimensions of the box and the complete shipping consignment on the pallet.

Table 2. Shipping dimensions

Dimension	Box with protective padding	Pallet with shipping consignment
Width	60 cm (23.6 in.)	80 cm (31.5 in.)
Length	55 cm (21.7 in.)	60 cm (23.6 in.)
Height	65 cm (25.6 in.)	80 cm (31.5 in.)

The total weight of the shipping container is 42 kg (92.6 lb) for the EASY-nLC II instrument and 45 kg (99.2 lb) for the EASY-nLC 1000 instrument.

Because the box comes with special protective padding, save the box for possible reuse.

CAUTION 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 instructions on what to do. If there is no evidence of shipping damage or mishandling, then you can proceed with the instructions that follow.

Placement

Out of the box, the EASY-nLC II instrument weighs approximately 32 kg (70.5 lb). The EASY-nLC 1000 instrument weighs approximately 35 kg (77.2 lb).

CAUTION The EASY-nLC instrument is too heavy for one person alone to lift. To avoid personal injury, use two people to move the instrument to a table cart for transport.

Table 2 lists the dimensions of the EASY-nLC II and EASY-nLC 1000 instruments.

Table 3. EASY-nLC instrument dimensions

Dimension	EASY-nLC II	EASY-nLC 1000
Width	35 cm (13.8 in.)	36 cm (14.2 in.)
Depth	38 cm (15.1 in.)	38 cm (15.1 in.)
Height	45 cm (17.7 in.)	45 cm (17.7 in.)

Provide at least 15 cm (6 in.) of free space at the back of the instrument to ensure proper air circulation and a least 15 cm (6 in.) above the instrument for the solvent bottles. Place the EASY-nLC instrument as close as possible to the MS detector (mass spectrometer) to minimize dead volume in the transfer lines.

Figure 1 shows the EASY-nLC instrument installed as part of an LC/MS system with a data system computer, an Ethernet switch, a Thermo Scientific mass spectrometer, and an EASY-Spray™ ion source.

Note The EASY-Spray source has a power supply unit that connects to an electrical wall outlet. The NanoFlex ion source gets its power from the mass spectrometer.

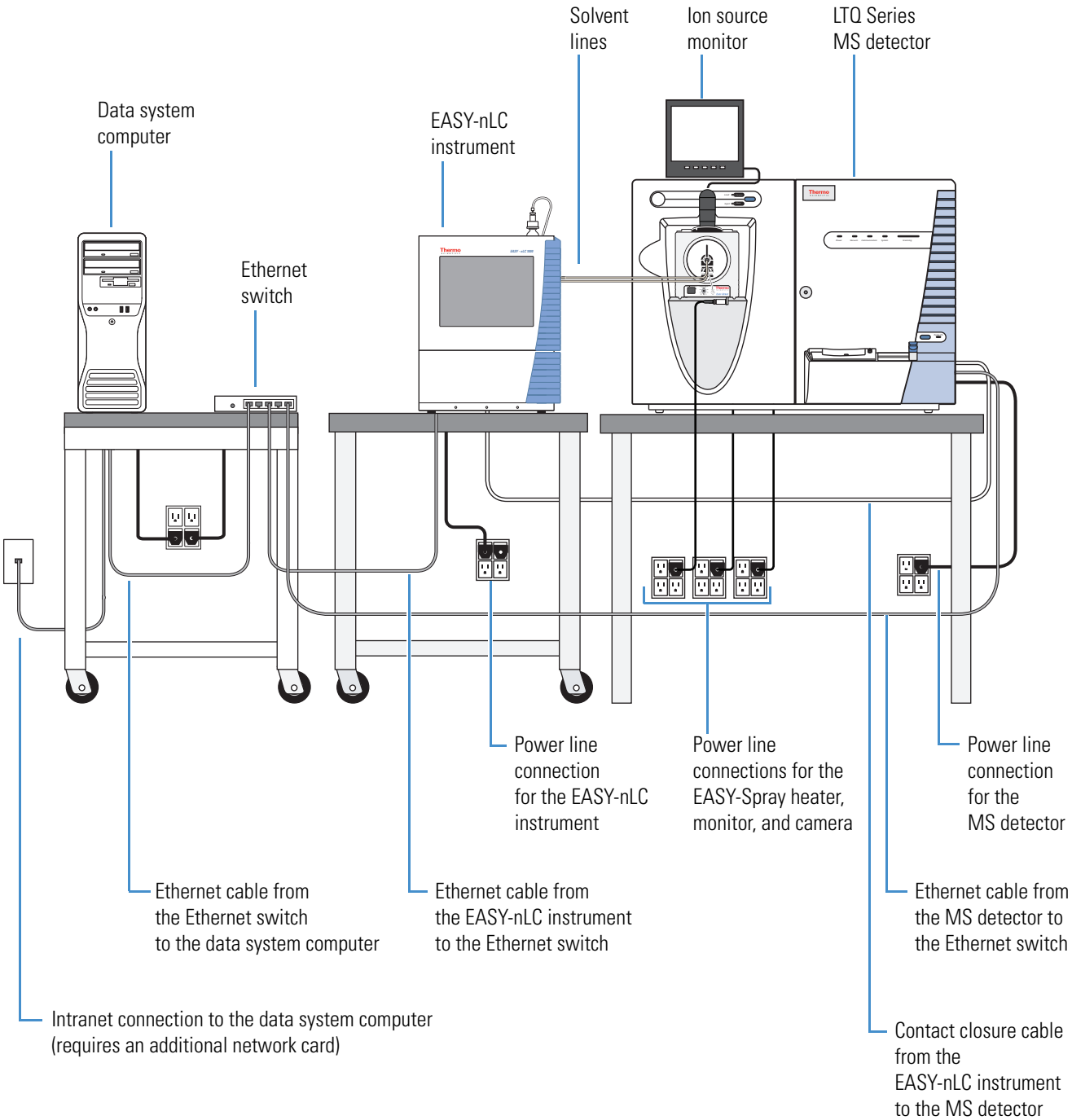
The Thermo Scientific MS detector and the EASY-nLC instrument communicate with the data system computer through an Ethernet switch that is connected to the data system computer. Connecting the data system computer to your local area network requires an additional network card.

IMPORTANT For remote diagnostics, connect the EASY-nLC instrument directly to the Internet access port using the supplied Category 6 network cable.

A contact closure cable between the EASY-nLC instrument and the Thermo Scientific MS detector synchronizes the run timing.

Table 5 on page 16 describes the line power connections.

Figure 1. LC/MS system setup with a data system computer connected to the local area network



Telephone

Install a telephone in your laboratory near the instrument so that, if necessary, you can conveniently operate the instrument while in contact by telephone with Thermo Fisher Scientific Technical Support. Place the voice telephone outlet within 2 m (6 ft) of your LC/MS 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.

Internet Access

For online support and monitoring, provide Internet access for the EASY-nLC instrument within reach of the laboratory benchtop, and ask your IT system administrator to set up the network firewalls to allow outgoing traffic to IP address 195.41.108.93, port 22.

IMPORTANT To connect to the Thermo Fisher Scientific support server, which is a Linux™ server, the EASY-nLC instrument uses the Secure Shell (SSH™) network protocol for secure data communication.

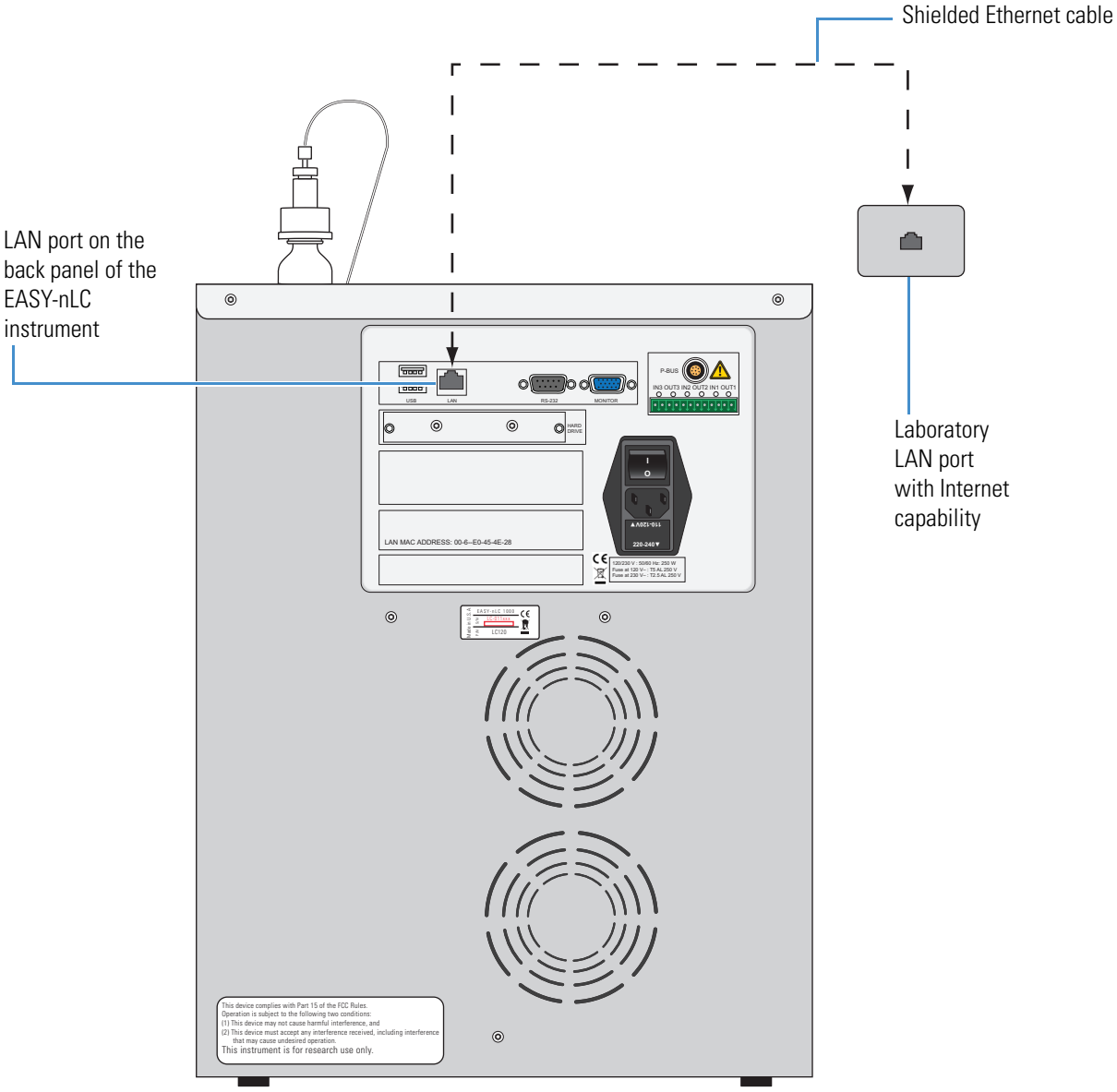
When you request a connection to the support server by using the EASY-nLC instrument's touch-screen controls, the SSH program on the EASY-nLC instrument opens a connection to the support server. This connection includes an SSH tunnel through which the remote support software and a Thermo Fisher Scientific technical support engineer can connect back to the EASY-nLC instrument to perform various operations on the EASY-nLC instrument.

To use the remote support feature, the firewalls for your local network must allow outgoing TCP/IP traffic from the EASY-nLC instrument to the support server at IP address 195.41.108.93, port 22.

When installing the EASY-nLC instrument, your local Thermo Fisher Scientific field service engineer sets up the instrument to use dynamic IP addresses through a local DHCP server, or gives it a fixed IP address (probably through your IT system administrator).

Figure 2 shows the EASY-nLC instrument connected to a laboratory LAN port with Internet capability by way of a shielded Ethernet cable.

Figure 2. Laboratory LAN port connection



3

Operating Environment

Attention to the operating environment will ensure continued high performance of your EASY-nLC instrument. Any expenditures for air conditioning are 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 EASY-nLC instrument.

Contents

- Temperature and Humidity
- Air Conditioning Load
- Vibration
- Lighting
- Particulate Matter
- Electrostatic Discharge

Temperature and Humidity

The air conditioning system must be capable of maintaining a temperature range of 5 to 30 °C (41 to 86 °F) with minimum temperature fluctuations. Temperature fluctuations greater than ±5 °C (±9 °F) can adversely affect chromatographic performance of the LC instrument.

IMPORTANT As the laboratory temperature increases, instrument reliability decreases. All electronic components generate heat while operating. For the components to continue to operate reliably, ensure that this heat is dissipated to the surrounding air.

There must be a good flow of room air around the instrument, and the air conditioning system must be capable of maintaining a constant temperature in the immediate vicinity of the instrument.

IMPORTANT To maintain instrument performance, do not place the EASY-nLC instrument under an air duct, near windows, or near heating or cooling sources.

Maintain the relative humidity of the operating environment between 20 to 80% with no condensation.

Operating an EASY-nLC instrument 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 instrument 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.

Air Conditioning Load

The typical air conditioning load for an EASY-nLC instrument is approximately 125 W.

Vibration

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

Lighting

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

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, fewer than 3 500 000 particles per cubic meter (100 000 particles per cubic foot).

Dust can clog the air filters, which causes reduced air flow 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.

Electrostatic Discharge

Electrostatic discharge (ESD) can damage the electronic components of your LC/MS 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. While ESD damage can be catastrophic and cause your system to cease functioning, more commonly, ESD damage might cause latent problems that are detrimental to sensitive electrical components, causing premature failures.

The LC/MS system is 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 printed circuit boards (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 percent relative humidity can generate as much as 35000 V of electrostatic potential on the surface of your body. A similar trip in a room at 80 percent relative humidity generates about 1500 V of electrostatic potential.
- Sitting and working in a chair padded with polyurethane foam in a room at 20 percent relative humidity can cause as much as 18000 V of electrostatic potential to develop on your skin. At 80 percent relative humidity, the electrostatic potential can be as much as 1500 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 LC/MS 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.

4

Line Power

The quality of line power delivered to your EASY-nLC instrument can affect its performance and longevity. To ensure that your LC instrument performs optimally and is not damaged by line power 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 LC instrument.

Contents

- Quality of Power
- Power Monitoring Devices
- Power Conditioning Devices
- Electrical Outlets
- Power Supply Cords
- Uninterruptible Power Supply
- Technical Assistance

Quality of Power

The quality of power supplied to your EASY-nLC instrument 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 4 contains definitions for the three most common voltage disturbances.

Table 4. 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

CAUTION 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, make sure that you establish the quality of the line voltage in your laboratory before installing an EASY-nLC instrument.

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.[1] 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.

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 percent outside of the voltage specifications, a buck/boost transformer can lower (buck 10 percent) or raise (boost 10 percent) the line voltage.

Each 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 the buck/boost transformer kit (P/N OPTON-01460), contact Thermo Fisher Scientific San Jose, and then have your electrician install the buck/boost transformer before a Thermo Fisher Scientific field service engineer installs your LC system. The transformer kit includes the installation instructions.

CAUTION For compliance and safety, recognized domestic and international organizations (for example, UL, CSA, TÜV, and VDE) must certify your uninterruptible power supply (UPS) devices.

[1] 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.

Electrical Outlets

Before you install an EASY-nLC instrument, plan your power system. See Table 5 for an example of the number of power outlets that your laboratory might require. A stand-alone EASY-nLC instrument requires one outlet. A Thermo Scientific MS detector and its associated data system hardware require two fourplex outlets. The nanospray ion source requires three power outlets.

Note For information about the power requirements for a Thermo Scientific mass spectrometer, refer to its preinstallation requirements guide or getting connected guide.

Locate the electrical outlets within reach of the workbench where you plan to install the LC/MS system. For information about the power cords supplied with the EASY-nLC system, see "Power Supply Cords" on page 18.

Table 5. Laboratory power outlets for an LC/MS system with an EASY-nLC instrument

Item	Outlets
EASY-nLC instrument	1
Data system for the MS detector and optional control of the EASY-nLC instrument	
• CPU	1
• Monitor	1
• Printer	1
• Ethernet switch	1
MS detector and ion source	
• Mass spectrometer	1
• Nanospray ion source	3
(Optional) High-intensity lamp: For help in instrument maintenance.	1
(Optional) Laboratory stereoscope: For inspecting fused-silica parts, used when performing nanoflow or microfluidic experiments.	1
Total outlets required for this configuration	9 to 11

Note 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.

These topics describe the line voltage, maximum load capacity, and grounding requirements for the electrical outlets:

- Line Voltage
- Grounding Requirements
- Maximum Load Capacity for Each Fourplex Outlet

Line Voltage

The EASY-nLC system is equipped with an auto-ranging power entry module and can operate within the range of 120/230 Vac ±10% 50/60 Hz; 250 VA.

Grounding Requirements

Installing an EASY-nLC instrument requires a minimum of one outlet. The electrical outlet must be earth ground hard-wired to the main panel.

If you are using the EASY-nLC instrument as an inlet to an MS detector, the LC/MS system might require two or more fourplex outlets. The interconnected electrical outlets for the LC instrument, the MS detector, and the data system computer must have a common point to one ground connector.

CAUTION When using the EASY-nLC instrument as an inlet to an LC/MS system, the LC instrument, the MS detector, and the (optional) data system hardware must have a common ground.

Connecting the hardware to external grounds at different potentials can do the following:

- Create a ground loop that causes noise and interference.
- Damage the EASY-nLC instrument's built-in computer.

CAUTION Improper grounding of the EASY-nLC instrument creates an electrical safety hazard.

Maximum Load Capacity for Each Fourplex Outlet

Do not exceed the electrical outlet specifications. The maximum load for a 115 Vac fourplex outlet is typically 20 A, and the maximum load for a 230 Vac fourplex outlet is typically 16 A.

The maximum current drawn by the EASY-nLC instrument depends on the line voltage:

- For 115 Vac line power, the EASY-nLC instrument draws up to 5.0 A.
- For 230 Vac line power, the EASY-nLC instrument draws up to 2.5 A.

CAUTION Never connect an MS detector and an EASY-nLC instrument to the same electrical outlet circuit. Connect the EASY-nLC instrument and the MS detector to separate electrical outlets.

Power Supply Cords

Each EASY-nLC instrument comes with a 2.5 m (8.2 ft) long power cord.

The data system hardware components that come with each Thermo Scientific MS detector are approximately 1.8 m (6 ft) long.

Uninterruptible Power Supply

If your local area is susceptible to corrupted power or power disruptions, 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, TÜV, and VDE).

Technical Assistance

Occasionally, you might encounter line power sources of unacceptable quality that adversely affect the operation of the EASY-nLC instrument. 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

The waste and exhaust arrangements for your EASY-nLC instrument can affect the proper performance of the instrument. You must collect and dispose of solvent wastes properly.

You are responsible for providing the proper waste disposal and ventilation systems required to operate your LC/MS system.

Waste solvent from the needle wash and purge steps collects in the waste bottle within the EASY-nLC instrument. The solvent from the pre-column equilibration step routes to the waste beaker within the EASY-nLC instrument. The maximum flow rate for a purge cycle is 300 µL/min.

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

Solvents

You are responsible for providing the high-purity solvents required to install and operate the EASY-nLC instrument.

The installation solvents for the EASY-nLC instrument are as follows:

Solvent A:	LC/MS-grade 0.1% formic acid in water
Solvent B:	LC/MS-grade 0.1% formic acid in acetonitrile
Wash solvent 3:	LC/MS-grade 0.1% formic acid in water

CAUTION Solvent contaminants can cause system blockages and poor spray stability. To minimize instrument problems caused by solvent contaminants, follow these guidelines for the EASY-nLC instrument:

- Use only LC/MS-grade solvents.
- Use only commercially manufactured LC/MS-grade solvent blends, as mixing solvents in a typical laboratory environment can introduce contaminants as well as solvent concentration errors.
- Do **not** filter LC/MS-grade solvents, as filtering solvents can introduce contaminants.
- Do **not** use HPLC-grade solvents, as HPLC-grade solvents contain more contaminants than LC/MS-grade solvents.
- Do **not** use water from laboratory purification systems, as laboratory purified water contains more contaminants than LC/MS-grade water.

IMPORTANT For best results, use the Optima™ brand of LC/MS-grade solvents and solvent blends supplied by Thermo Fisher Scientific. These solvents are manufactured in facilities with an ISO 9001:2008 certified quality system to ensure optimum quality and product uniformity.

To prepare these solutions, order the appropriate LC/MS-grade solvents and solvent blends. Table 6 lists the solvents that you can order from Thermo Fisher Scientific.

Table 6. Solvents

Solvent/reagent	Specification
Water	LC/MS grade
Acetonitrile	LC/MS grade
Formic acid (99.5%)	LC/MS grade
0.1% formic acid in water	LC/MS grade
0.1% formic acid in acetonitrile	LC/MS grade

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

❖ To order LC/MS-grade solvents from Thermo Fisher Scientific

1. Do one of the following:

   - Click this icon,  .

   –or –

   - Go to: www.FisherLCMS.com

   The Fisher Scientific Liquid Chromatography/Mass Spectrometry Web site opens.

2. Click the **Solvents** tab.

7

Installation

Before installation, make sure that all preparations described in the previous chapters are complete.

When you have completed your laboratory site preparation, the EASY-nLC Installation Request Form has been mailed or faxed to your local office for Thermo Scientific products, and the instrument has been delivered, call your local Thermo Fisher Scientific office to arrange for an installation date.

Contents

- Spare Parts
- Common Replacement Parts
- Additional Installation Peripherals
- Training
- Preventive Maintenance

Spare Parts

Table 7 lists the spare parts supplied with the EASY-nLC II instrument and Table 8 lists the spare parts supplied with the EASY-nLC 1000 instrument.

Note The EASY-nLC II instrument has been discontinued. Service, spare parts, and consumables for the EASY-nLC II instrument are available through the normal channels

Note The EASY-nLC instrument comes with a contact closure cable for a Thermo Scientific MS detector. If you plan to connect the nanoflow LC instrument to a non-Thermo Scientific MS detector, order the appropriate contact closure cable (see Table 11 on page 27).

Table 7. Spare parts shipped with the EASY-nLC II instrument

Description	Part number
Autosampler vials with caps (24)	N/A
Adapter, 8 × 12 microtiter plate	LC191
Cable, contact closure, Thermo Scientific MS detector	LC160
Cables, Ethernet	N/A
Column, test, precolumn	SC001
Column, test, analytical	SC200
Cord, Power	N/A
Fuses	
110 V, 5 A	LC157
230 V, 2.5 A	LC158
Microtiter plates, 8 × 12 (2) and silicone mats (2)	N/A
Solvent bottles	LC186
Wash bottles (6)	LC182
Wash insert (1)	LC184
Wrench, 1/4 in.	N/A
Union, leak test, stainless steel, 1/32 in. ID, 15 000 psi rated	SC600

Table 8. Spare parts shipped with the EASY-nLC 1000 instrument

Description	Part number
Autosampler injection needle	LC251
Autosampler vials with caps (24)	N/A
Adapter, 8 × 12 microtiter plate	LC191
Cable, contact closure, Thermo Scientific MS detector	LC160
Cables, Ethernet (2)	N/A
Cord, Power	N/A
Fuses	
110 V, 5 A	LC157
230 V, 2.5 A	LC158
Microtiter plates, 8 × 12 (2) and silicone mats (2)	N/A
Seal, valve rotor (1)	LC228
Seals, piston (4) and installation tool	LC510
Solvent bottles	LC186
Tubing, column out	LC560
Wash bottles (6)	LC182
Wash insert (1)	LC184
Wrench, 1/4 in.	N/A
Union, leak test, stainless steel (Viper union)	SC900

Common Replacement Parts

For proper maintenance of your EASY-nLC instrument, Thermo Fisher Scientific recommends that you maintain an inventory of replacement parts.

Table 9 lists the annual consumption of common replacements parts for the EASY-nLC II instrument.

Table 9. Common replacement parts for the EASY-nLC II instrument

Description	Part number	Annual consumption
Pump Piston Seal Replacement Kit (contains four piston seals and the piston seal tool)	LC210	4 piston seals (1/pump)
Valve rotor seal for valve serial numbers V-009999 and below (contains one rotor seal)	LC224	8 rotor seals (2/valve)
Valve rotor seal for valve serial numbers V-010000 and above (contains one rotor seal)	LC228	8 rotor seals (2/valve)
Column Out solvent line	LC260	2
Waste In solvent line	LC262	1
Autosampler needle, ASA model	LC251	1
Autosampler needle, ASC model	LC302	2
Valve to flow sensor line (contains two flow sensor lines)	LC222	2
Replacement filter discs (contains two 10 µm filter discs)	LC232	2 filter discs (1/solvent bottle)

Table 10 lists the annual consumption of common replacements parts for the EASY-nLC 1000 instrument.

Table 10. Common replacement parts for the EASY-nLC 1000 instrument

Description	Part number	Annual consumption
Pump Piston Seal Replacement Kit (contains four piston seals and the piston seal tool)	LC510	4 piston seals (1/pump)
Valve rotor seal (contains one rotor seal)	LC228	8 rotor seals (2/valve)
Column Out solvent line	LC560	2
Waste In solvent line	LC562	1
Autosampler needle, ASC model	LC302	2
Flow sensor filters (contains four flow sensor filters)	LC542	4 flow sensor filters (2/flow sensor)
Replacement filter discs (contains two 10 µm filter discs)	LC232	2 filter discs (1/solvent bottle)

Additional Installation Peripherals

To install the EASY-nLC instrument as an inlet to an MS detector, do the following:

- Order the appropriate ion source.

  Thermo Fisher Scientific recommends that you use the Thermo Scientific Nanospray Flex ion source.

- Ensure that the mass spectrometer and ion source are on site before the scheduled installation date.

- If necessary, order a contact closure cable compatible with your MS detector.

Table 11 lists the contact closure cables that Thermo Fisher Scientific supplies for the EASY-nLC instrument.

Table 11. Contact closure cables

MS detector	Part number
Thermo Scientific (supplied with the EASY-nLC instrument)	LC160
ABI/MDS/Sciex™	LC161
Bruker™/Agilent™	LC162
Waters™/Micromass™	LC163
Varian™	LC164

Training

When your new EASY-nLC instrument is on site and ready for installation, a Thermo Fisher Scientific field service engineer will install it.

During the installation, the field service engineer demonstrates the basics of equipment operation and routine maintenance. You are responsible for ensuring that the appropriate personnel are present for this training session.

Do not plan to use your new instrument for sample analysis until the installation is complete and you have signed the acceptance form.

Preventive Maintenance

Routine and preventive maintenance of the EASY-nLC instrument is your responsibility.

Regular preventive maintenance is essential. It increases the life of the instrument, maximizes the uptime of your instrument, and provides you with optimum instrument performance. For more information on maintenance procedures, refer to the user guide for the EASY-nLC instrument.

8

Instrument Arrival

Electronic equipment carriers that specialize in the handling of delicate machinery ship the EASY-nLC instrument to your site. Occasionally, however, equipment is damaged in transit.

You are responsible for checking the shipping packages upon arrival.

Contents

- Receiving Shipping Packages and Reporting Damage
- Shipment Methods

Receiving Shipping Packages and Reporting Damage

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

If the instrument shipping container, Shock Watch, or other indicators show evidence of damage or mishandling during shipment, do NOT open the container. Call your Thermo Fisher Scientific representative for further instructions.

The preface of this guide and the contact information following the Installation Request Form list telephone and fax numbers for service offices.

IMPORTANT Freight insurance requires that you note obvious damage on the receiving documents. 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.

Take the following precautions when receiving 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.
- To report the damage, contact your local service office.

Shipment Methods

If the instrument is damaged in transit, the shipment method determines who is responsible for filing a claim against the carrier.

Domestic Shipments

Thermo Fisher Scientific ships instruments from the San Jose site to destinations in the United States in these ways:

- Destination or Origin—carrier paid by Thermo Fisher Scientific

  Any damage incurred in shipment is the responsibility of Thermo Fisher Scientific, and Thermo Fisher Scientific files a claim against the carrier.

- Origin—carrier paid by the Customer

  Any damage incurred in shipment is the responsibility of both the purchaser and the carrier.

International Shipments

Unless specified differently, Thermo Fisher Scientific uses only one shipping method to ship instruments from the San Jose site to international destinations: Carriage Paid To (CPT) destination. Thermo Fisher Scientific pays the carriage freight. Once the instrument reaches the carrier, any damage incurred in shipment is the responsibility of both the purchaser and the carrier.

If the instrument is shipped Carriage and Insurance Paid (CIP) to destination and if any damage is incurred in shipment, Thermo Fisher Scientific files a claim against the carrier.

Index

A

acetonitrile 22
air conditioning load 10

B

best practices
  ordering pre-mixed solvent blends 21
  using power conditioners 15
blending solvents 21
buck/boost transformer kit 15

C

Carriage Paid To (CPT), international shipments 30
compliance
  FCC vii
  regulatory vii
  WEEE ix
computer damage, cause of 17
consumable parts
  EASY-nLC 1000 instrument 25
  EASY-nLC II instrument 24
contact closure cables, ordering 27
contact information
  Customer Service (U.S., Canada) xvi
  Technical Support xvi
  worldwide service offices v–vi

D

dimensions
  EASY-nLC instrument 4
  shipping containers 3
documentation, accessing xiv, xvi

E

electrical outlets 16
electrostatic discharge requirements 11
EMC compliance vii
ESD requirements 11

F

fans 10
FCC compliance vii
filtering solvents 21
firewalls, network 6
formic acid 22
freight insurance 29

G

grounding requirements 17

H

HPLC-grade solvents 21
humidity, operating environment 10

I

installation request form iii, 23
insurance, freight 29
Internet access 6
ion source, nanospray 4, 27
isolation/noise-suppression transformer 15

L

LC/MS-grade solvents 21
lighting requirements 10
line power
  electrical outlets 16
  monitoring 15
  nanospray ion source 16
  power conditioning devices 15
  quality 14
  requirements 13, 18
line voltage, operating range 17

M

maintenance 28
manuals, customer xiv, xvi
mixing solvents 21
MS detector, proximity of 4

N

network
  cards 4
  firewalls 6
noise and interference, cause of 17

O

operating environment
  electrostatic discharge 11
  humidity 10
  particulate matter 10
outlets, electrical 16

P

particulate matter requirements 10
port 22, firewall setup for 6
power
  monitoring devices 15
  quality of 15
purification system, water 21

R

regulatory compliance vii
replacement parts
  EASY-nLC 1000 instrument 27
  EASY-nLC II instrument 26

S

safety and special notices xv
safety standards vii
Secure Shell (SSH) network protocol 6
shipments
  damaged equipment 4
  domestic 30
  international 30
site preparation 3
solvents
  filtering 21
  installation 21
  ordering Fisher Scientific solvents 22
space requirements 3
spare parts
  EASY-nLC 1000 instrument 25
  EASY-nLC II instrument 24

T

technical assistance 18
telephone 6
temperature, operating environment 9
training 28

U

uninterruptible power supply 18
URLs, consumable parts xvi
USB flash drive with manuals xiv

V

ventilation system 19
vibration, floor 10

W

waste solvents, disposing of 19
water 22
WEEE compliance ix
weight, EASY-nLC instrument 4