User Guide

LFD-200

Live Fiber Detector

www.EXFO.com

Telecom Test and Measurement

EXFO

EXPERTISE REACHING OUT

EXFO's Commerce And Government Entities (CAGE) code under the North Atlantic Treaty Organization (NATO) is 0L8C3.

The information contained in this publication is subject to change without notice.

Trademarks

EXFO's trademarks have been identified as such. However, the presence or absence of such identification does not affect the legal status of any trademark.

Units of Measurement

Units of measurement in this publication conform to SI standards and practices.

Version number: 3.0.0

Contents

Certification

FCC Information

Electronic test equipment is exempt from Part 15 compliance (FCC) in the United States. However, compliance verification tests are systematically performed on most EXFO equipment.

CE Information

Electronic test equipment is subject to the EMC Directive in the European Union. The IEC 61326-1 standard prescribes both emission and immunity requirements for laboratory, measurement, and control equipment.

DECLARATION OF CONFORMITY

Application of Council Directive(s):

89/336/EEC - The EMC Directive
93/68/EEC – CE Marking
And their amendments

Manufacturer's Name and Address:

EXFO Inc.
400 Godin Avenue
Quebec City, Quebec
G1M 2K2 CANADA
Tel.: +1 418 683-0211

EXFO Europe
Omega Enterprise Park, Electron Way
Chandlers Ford, Hampshire
SO53 4SE ENGLAND
Tel.: +44 2380 246810

Equipment Type/Environment:
Test & Measurement / Industrial

Trade Name/Model No.:
Live Fiber Detector / LFD-200

Standard(s) to which Conformity is declared:

EN 61326-1:1997 +A1 :1998 A+ :2001 +A3 :2003	**Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements**

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive and Standards.

Manufacturer:

Stephen Bull, E. Eng
Vice-President Research and Development

400 Godin Avenue,
Quebec City, Quebec
G1M 2K2 CANADA
November 15, 2001

CE EXFO

1 Introducing the LFD-200 Live Fiber Detector

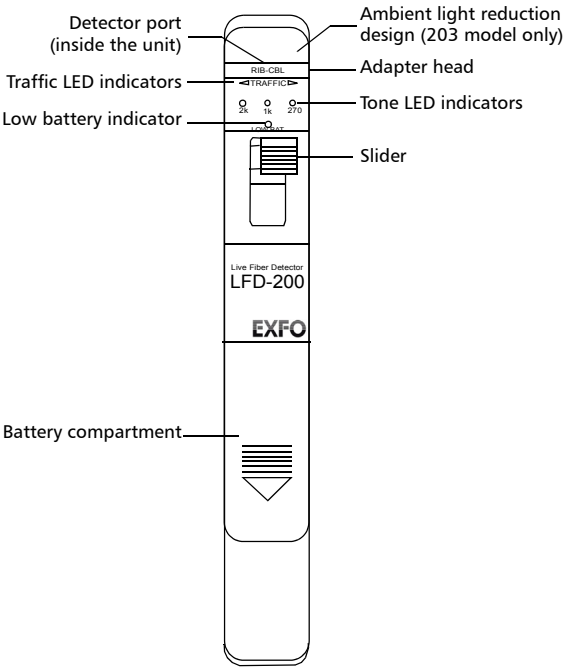
Main Features

The LFD-200 Live Fiber Detector detects traffic and measures optical signals transmitted through singlemode and multimode fibers without having to disconnect them.

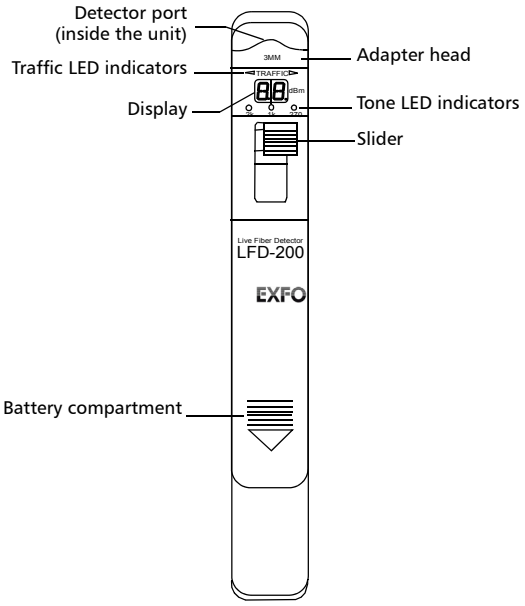
The Live Fiber Detector uses a safe macrobending technique that does not disrupt traffic (that is, it eliminates the need to identify a fiber by opening it at the splice point). At the same time, it avoids damaging or overstressing the fiber. You end up with accurate and reliable information.

The Live Fiber Detector comes with interchangeable adapter heads stored right into the unit. It also features a slider that can be locked for hands-free operation.

LFD-201 and LFD-203 models



LFD-202 and LFD-202P models



Typical Applications

Your Live Fiber Detector can be used to:

- verify the presence of a signal before re-routing or maintenance
- perform continuity tests
- verify cable labeling

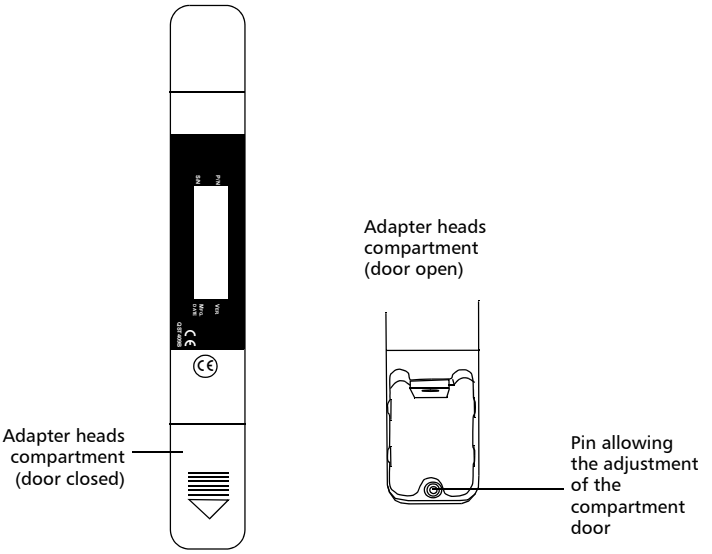
Available Models

Four different models are available, as explained in the table below:

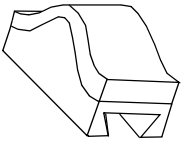
Model	Description
LFD-201	➤ Detects continuous signal or signal modulated at 270 Hz, 1 kHz, and 2 kHz. ➤ Comes with three interchangeable adapter heads: 250 μm, 900 μm, 3 mm.
LFD-202	➤ Detects continuous signal or signal modulated at 270 Hz, 1 kHz, and 2 kHz. ➤ Displays the relative core power in the fiber (that is, between –6 dbm and –40 dBm). ➤ Comes with three interchangeable adapter heads: 250 μm, 900 μm, 3 mm.
LFD-202P	➤ Detects continuous signal or signal modulated at 270 Hz, 1 kHz, and 2 kHz. ➤ Displays the relative core power in the fiber (that is, between +14 dbm and –19 dBm). ➤ Comes with three interchangeable adapter heads: 250 μm, 900 μm, 3 mm.
LFD-203	➤ Detects continuous signal or signal modulated at 270 Hz, 1 kHz, and 2 kHz. ➤ Especially designed for ribbon fibers. ➤ Comes with three interchangeable adapter heads: 3 mm, bare ribbon, jacketed ribbon.

Adapter Heads

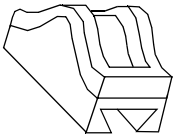
The Live Fiber Detector comes with interchangeable adapter heads for simple conversion and multiple fiber-type testing. The adapter heads are stored in an internal storage compartment located at the back of the unit.



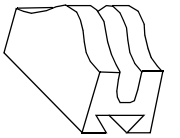
The LFD-201, LFD-202 and LFD-202P Live Fiber Detector are supplied with three adapter heads:



Foam-covered adapter head to be used with a 900 μm buffered fiber.



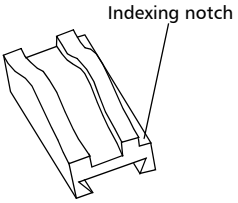
Adapter head with a smooth surface and a foam perimeter to be used with a ribbon fiber or a 250 μm coated fiber.



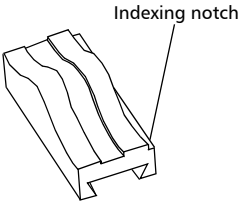
Slotted adapter head to be used with a 3 mm or a 2 mm jacketed fiber (that is, pigtails and jumpers) or a loose tube fiber.

The LFD-203 Live Fiber Detector is supplied with three adapter heads.

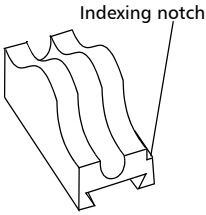
The adapter heads for the LFD-203 model have an indexing notch, which is part of the ambient-light-reduction design.



Deep-slot adapter head to be used with a jacketed ribbon fiber of up to 12 counts.



Shallow-slot adapter head to be used with a bare ribbon fiber of up to 12 counts.



Slotted adapter head to be used with a 3 mm or a 2 mm jacketed fiber (that is, pigtails and jumpers) or a loose tube fiber.

Power Source

The Live Fiber Detector is powered by a 9 V alkaline battery.

When the battery voltage becomes low, the LOW BAT LED illuminates (LFD-201 and LFD-203 models) or ***Lb*** appears on the display (LFD-202 and LFD-202P models).

The unit will continue to operate for some time, but the battery should be replaced with a fresh 9 V alkaline battery as soon as possible (see *Replacing the 9 V Battery* on page 11).

Conventions

Before using the product described in this guide, you should understand the following conventions:

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in *death or serious injury*. Do not proceed unless you understand and meet the required conditions.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *minor or moderate injury*. Do not proceed unless you understand and meet the required conditions.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *component damage*. Do not proceed unless you understand and meet the required conditions.

IMPORTANT

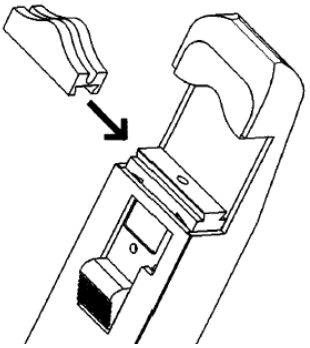
Refers to information about this product you should not overlook.

2 Operating the Live Fiber Detector

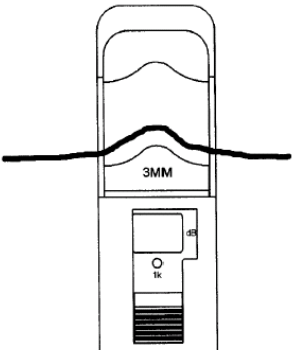
To operate the Live Fiber Detector:

1. Choose an adapter head for the type of fiber to be tested (see *Adapter Heads* on page 4).
2. Slide the adapter head into the mating slotted channel, applying a slight downward pressure.

   If you have the LFD-203 Live Fiber Detector model, be sure to place the adapter with the indexing notch facing the front of the unit.



3. Place the fiber gently in the alignment groove of the adapter head.



4. Slide the switch upward.

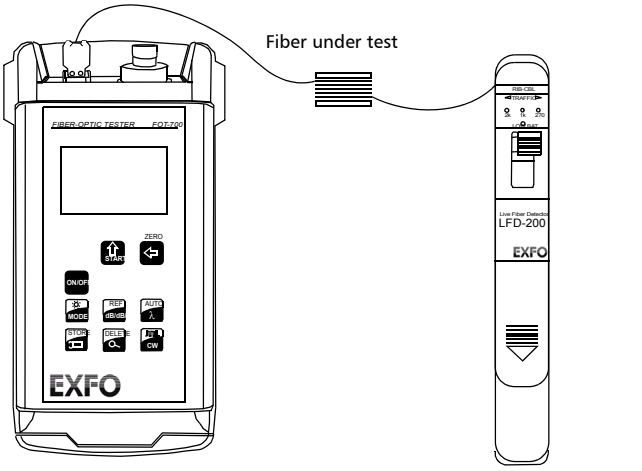
   OR

   For hands-free operation, slide the switch upward and over to the right to lock it in place.

Note: *Each time the switch is operated, the Live Fiber Detector performs a self-test. During the self-test, all LEDs will illuminate and will turn off after approximately 0.5 seconds.*

5. If you want to send a modulated signal, connect the unit to a source (such as EXFO FOT-700 Fiber-Optic Tester, FLS-130A Fiber-Optic Light Source or FLS-210A Variable Light Source), as illustrated below.

Note: *The recommended wavelength is 1550 nm for tone identification. If you use another wavelength than 1310 nm or 1550 nm, the Live Fiber Detector will still detect the signal, but the specifications are not guaranteed.*



FOT-700 Fiber-Optic Tester LFD-200 Live Fiber Detector

6. Evaluate the presence and direction of light transmission.

- ➤ If the traffic LED indicator located on the left-hand side is illuminated, the traffic is coming from the right.
- ➤ If the traffic LED indicator located on the right-hand side is illuminated, the traffic is coming from the left.

A beep also indicates the presence of traffic.

7. Identify the tone.

If you have connected a source to send a modulated signal, one of the 270 Hz, 1 Hz, or 2 kHz tone LED indicator will be illuminated.

Note: *During the operation at the lowest levels of tone detection (approximately –40 dB core power), the tone LEDs may flicker, which indicates that the minimum range of detection was reached.*

8. If you have the LFD-202 or LFD-202P Live Fiber Detector model, look at the relative core power of the fiber on the display.

LFD-202	LFD-202P
Displays the relative core power with a negative dB value between –6 and –40 dBm. If the core power is greater than 0 dBm, ➤ The unit displays ***HI***. ➤ Traffic LED indicators are valid. If the core power is below –40 dB, ➤ The unit displays ***LO***. ➤ Traffic LED indicators are no longer valid.	Displays the relative core power with a dB value between +4 and –19 dBm. If the core power is greater than + 15 dBm, ➤ The unit displays ***HI***. ➤ Traffic LED indicators are valid. If the core power is below –19 dB, ➤ The unit displays ***LO***. ➤ Traffic LED indicators are no longer valid.

3 Maintenance

To help ensure long, trouble-free operation:

- Always inspect fiber-optic connectors before using them and clean them if necessary.
- Keep the unit free of dust.
- Clean the unit casing and front panel with a cloth slightly dampened with water.
- Store unit at room temperature in a clean and dry area. Keep the unit out of direct sunlight.
- Avoid high humidity or significant temperature fluctuations.
- Avoid unnecessary shocks and vibrations.
- If any liquids are spilled on or into the unit, turn off the power immediately, disconnect from any external power source, remove the batteries and let the unit dry completely.

WARNING

Use of controls, adjustments, and procedures for operation and maintenance other than those specified herein may result in hazardous radiation exposure.

To clean detector ports:

1. If the detector is dusty, blow dry with compressed air.
2. Being careful not to touch the soft end of the swab, moisten a cleaning tip with *only one drop* of isopropyl alcohol.

IMPORTANT

Alcohol may leave traces if used abundantly. Do not use bottles that distribute too much alcohol at a time.

3. While applying light pressure (to avoid breaking the detector window), gently rotate the cleaning tip on the detector window.
4. Repeat step 3 with a dry cleaning tip or blow dry with compressed air.
5. Discard the cleaning tips after one use.

Replacing the 9 V Battery

When the battery voltage becomes low, the LOW BAT LED illuminates (LFD-201 and LFD-203 models) or ***Lb*** appears on the display (LFD-202 and LFD-202P models).

The unit will continue to operate for some time, but the battery should be replaced with a fresh 9 V alkaline battery as soon as possible.

To replace the 9 V battery:

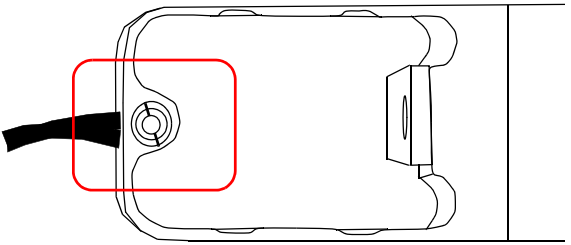
1. Turn off the Live Fiber Detector.
2. Open the battery compartment door located at the front of the unit.
3. Change the 9 V battery, respecting the polarity.
4. Close the battery compartment door.

Adjusting Compartment and Battery Doors

With time and handling, the adapter head compartment door, as well as the battery door may require adjustment to ensure the proper operation of your Live Fiber Detector.

To adjust the door(s):

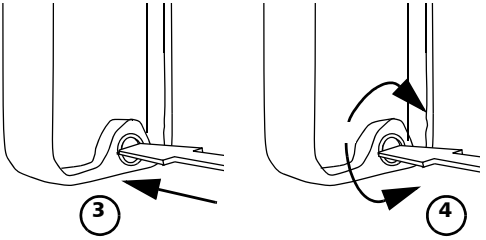
1. Open the door you want to adjust by pressing on it and sliding it away from the Live Fiber Detector.
2. Locate the adjustment screw.



3. With a flat-head screwdriver, press down on the small silver ball until the head of the screwdriver fits into the small grooves on each side of the screw.

Note: *You must press down on the silver ball to be able to turn the screw.*

4. Turn the screw clockwise or counterclockwise, on whether you want to slacken or tighten the screw.



5. Close the door.

Recycling and Disposal (Applies to European Union Only)

For complete recycling/disposal information as per European Directive WEEE 2002/96/EC, visit the EXFO Web site at www.exfo.com/recycle.

4 Troubleshooting

Contacting the Technical Support Group

To obtain after-sales service or technical support for this product, contact EXFO at one of the following numbers. The Technical Support Group is available to take your calls from Monday to Friday, 8:00 a.m. to 7:00 p.m. (Eastern Time in North America).

For detailed information about technical support, visit the EXFO Web site at www.exfo.com.

Technical Support Group
400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
support@exfo.com

To accelerate the process, please have information such as the name and the serial number (see the product identification label), as well as a description of your problem, close at hand.

Transportation

Maintain a temperature range within specifications when transporting the unit. Transportation damage can occur from improper handling. The following steps are recommended to minimize the possibility of damage:

- Pack the unit in its original packing material when shipping.
- Avoid high humidity or large temperature fluctuations.
- Keep the unit out of direct sunlight.
- Avoid unnecessary shocks and vibrations.

5 Warranty

General Information

EXFO Inc. (EXFO) warrants this equipment against defects in material and workmanship for a period of one year from the date of original shipment. EXFO also warrants that this equipment will meet applicable specifications under normal use.

During the warranty period, EXFO will, at its discretion, repair, replace, or issue credit for any defective product, as well as verify and adjust the product free of charge should the equipment need to be repaired or if the original calibration is erroneous. If the equipment is sent back for verification of calibration during the warranty period and found to meet all published specifications, EXFO will charge standard calibration fees.

IMPORTANT

The warranty can become null and void if:

- **unit has been tampered with, repaired, or worked upon by unauthorized individuals or non-EXFO personnel.**
- **warranty sticker has been removed.**
- **case screws, other than those specified in this guide, have been removed.**
- **case has been opened, other than as explained in this guide.**
- **unit serial number has been altered, erased, or removed.**
- **unit has been misused, neglected, or damaged by accident.**

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL EXFO BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

Liability

EXFO shall not be liable for damages resulting from the use of the product, nor shall be responsible for any failure in the performance of other items to which the product is connected or the operation of any system of which the product may be a part.

EXFO shall not be liable for damages resulting from improper usage or unauthorized modification of the product, its accompanying accessories and software.

Exclusions

EXFO reserves the right to make changes in the design or construction of any of its products at any time without incurring obligation to make any changes whatsoever on units purchased. Accessories, including but not limited to fuses, pilot lamps, batteries and universal interfaces (EUI) used with EXFO products are not covered by this warranty.

This warranty excludes failure resulting from: improper use or installation, normal wear and tear, accident, abuse, neglect, fire, water, lightning or other acts of nature, causes external to the product or other factors beyond the control of EXFO.

IMPORTANT

EXFO will charge a fee for replacing optical connectors that were damaged due to misuse or bad cleaning.

Certification

EXFO certifies that this equipment met its published specifications at the time of shipment from the factory.

Service and Repairs

EXFO commits to providing product service and repair for five years following the date of purchase.

To send any equipment for service or repair:

1. Call one of EXFO's authorized service centers (see *EXFO Service Centers Worldwide* on page 17). Support personnel will determine if the equipment requires service, repair, or calibration.
2. If equipment must be returned to EXFO or an authorized service center, support personnel will issue a Return Merchandise Authorization (RMA) number and provide an address for return.
3. If possible, back up your data before sending the unit for repair.
4. Pack the equipment in its original shipping material. Be sure to include a statement or report fully detailing the defect and the conditions under which it was observed.
5. Return the equipment, prepaid, to the address given to you by support personnel. Be sure to write the RMA number on the shipping slip. *EXFO will refuse and return any package that does not bear an RMA number.*

Note: *A test setup fee will apply to any returned unit that, after test, is found to meet the applicable specifications.*

After repair, the equipment will be returned with a repair report. If the equipment is not under warranty, you will be invoiced for the cost appearing on this report. EXFO will pay return-to-customer shipping costs for equipment under warranty. Shipping insurance is at your expense.

Routine recalibration is not included in any of the warranty plans. Since calibrations/verifications are not covered by the basic or extended warranties, you may elect to purchase FlexCare Calibration/Verification Packages for a definite period of time. Contact an authorized service center (see *EXFO Service Centers Worldwide* on page 17).

EXFO Service Centers Worldwide

If your product requires servicing, contact your nearest authorized service center.

EXFO Headquarters Service Center
400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
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A Technical Specifications

IMPORTANT

The following technical specifications can change without notice. The information presented in this section is provided as a reference only. To obtain this product's most recent technical specifications, visit the EXFO Web site at *www.exfo.com*.

SPECIFICATIONS

LFD-201, LFD-202 and LFD-202E

Optical Characteristics, Typical	
Optical tone receiver	270 Hz, 1 kHz, 2 kHz
Detection technique	Non-destructive macrobending
Loss	< 0.6 dB at 1310 nm
Spectral response	800 nm to 1650 nm
Minimum fiber slack	1.2 cm ($^1/_2$ in) required for detection
Core Power Detection, Typical [a]	
LFD-201	0 dBm to –40 dBm
LFD-202	0 dBm to –40 dBm
LFD-202E	23 dBm to –50 dBm
Fiber Compatibility	
Dual window, singlemode	8 µm to 10 µm core diameter
Coating diameter	250 µm diameter
Coating	High refractive index, acrylate

Note

a. At 1550 nm.

NOTICE
通告

CHINESE REGULATION ON RESTRICTION OF HAZARDOUS SUBSTANCES
中国关于危害物质限制的规定

NAMES AND CONTENTS OF THE TOXIC OR HAZARDOUS SUBSTANCES OR ELEMENTS CONTAINED IN THIS EXFO PRODUCT
包含在本 **EXFO** 产品中的有毒有害物质或元素的名称和含量

O	Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。
X	Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

Part Name 部件名称	Toxic or hazardous Substances and Elements 有毒有害物质和元素					
	Lead 铅 (Pb)	Mercury 汞 (Hg)	Cadmium 隔 (Cd)	Hexavalent Chromium 六价铬 (Cr VI)	Polybrominated biphenyls 多溴联苯 (PBB)	Polybrominated diphenyl ethers 多溴二苯醚 (PBDE)
Enclosure 外壳	O	O	O	O	O	O
Electronic and electrical sub-assembly 电子和电子组件	X	O	X	O	X	X
Optical sub-assembly[a] 光学组件 [a]	X	O	O	O	O	O
Mechanical sub-assembly[a] 机械组件 [a]	O	O	O	O	O	O

a. If applicable.
如果适用。

MARKING REQUIREMENTS
标注要求

Product 产品	Environmental protection use period (years) 环境保护使用期限 (年)	Logo 标志
This Exfo product 本 EXFO 产品	10	
Battery[a] 电池 [a]	5	

a. If applicable.
如果适用。

P/N: 1061979

www.EXFO.com · info@exfo.com

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EXFO SERVICE ASSURANCE	270 Billerica Road	Chelmsford MA, 01824 USA Tel.: 1 978 367-5600 · Fax: 1 978 367-5700
EXFO NETHAWK	Elektroniikkatie 2	FI-90590 Oulu, FINLAND Tel.: +358 (0) 403 010 300 Fax: +358 (0) 8 564 5203
TOLL-FREE	(USA and Canada)	1 800 663-3936

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