

AVA **Documents**
Document Sharing Hub

Northbrook, Illinois • (708) 272-8800
 Melville, New York • (516) 271-6200
 Santa Clara, California • (408) 985-2400
 Research Triangle Park,
 North Carolina • (919) 549-1400



Subject 183

12 Laboratory Drive
 Research Triangle Park, NC 27709
 May 31, 1994

TO: Subscribers to UL's Listing Service for Manufactured Wiring Systems (QQVX)

SUBJECT: UL's Comprehensive Canadian Certification Services

As previously announced on February 16, 1993, UL has been granted status as both a Canadian Certification Organization (CO) and as a Testing Organization (TO) by the Standards Council of Canada. UL is the first safety certification organization in the United States to be granted accreditation by the Standards Council of Canada and the first to have acceptance of its Listing Mark for Canada in every Canadian Province and Territory.

Accordingly, UL has established a Canadian Certification Service whereby products submitted for Listing to the Standard for Manufactured Wiring Systems, UL 183, can also be Listed in accordance with the Canadian Standards Association Technical Information Letter, (TIL) No. A-22 dated September 13, 1993. Through a complimentary program, **UL is prepared to offer this Canadian Certification at no additional charge** when the materials needed to determine compliance with the Canadian requirements are provided at the time of submittal. These materials generally include information regarding the French text for warning markings and markings for non-interrupting rated mating connectors.

Requests for additional information regarding these programs should be directed to the following individuals at the nearest UL office.

NORTHBROOK OFFICE

P. Scherwinski
 Underwriters Laboratories Inc.
 333 Pfingsten Road
 Northbrook, IL 60062-2096
 Tel: 708-272-8800 (Ext. 43775)
 Fax: 708-272-8129

MELVILLE OFFICE

J. Barbu
 Underwriters Laboratories Inc.
 1285 Walt Whitman Road
 Melville, NY 11747
 Tel: 516-271-6200 (Ext. 22378)
 Fax: 516-271-8259

A not-for-profit organization
 dedicated to public safety and
 committed to quality service

Subject 183

-2-

May 31, 1994

SANTA CLARA OFFICE

D. Cassano
Underwriters Laboratories Inc.
1655 Scott Blvd.
Santa Clara, CA 95050
Tel: 408-985-2400 (Ext. 2109)
Fax: 408-296-3256

RTP OFFICE

V. Quiett
Underwriters Laboratories Inc.
12 Laboratory Dr.
P.O. Box 13995
Research Triangle Park, NC 27709
Tel: 919-549-1400 (Ext. 1694)
Fax: 919-549-1842

UNDERWRITERS LABORATORIES INC.

Vincent Quiett

Vincent Quiett (Ext. 1694)
Project Engineer
Engineering Services - 113A

SR:JTM

REVIEWED BY:

Richard Rasmussen

Richard Rasmussen (Ext. 1515)
Associate Managing Engineer
Engineering Services - 113A

**Underwriters Laboratories Inc.®**

An independent, not-for-profit organization testing for public safety

August 20, 1993**Revision pages for****Standard for****Manufactured Wiring Systems****UL 183, Second Edition**

Attached to this transmittal notice is a revision of the second edition of UL 183.

A CHANGE ON A PAGE DATED AUGUST 20, 1993 IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM, PRECEDED AND FOLLOWED BY AN ASTERISK.

THESE NEW AND REVISED REQUIREMENTS ARE NOW IN EFFECT EXCEPT FOR 27.10, WHICH BECOMES EFFECTIVE FEBRUARY 1, 1994 AS INDICATED IN THE SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM. TO RETAIN THE REQUIREMENTS IN EFFECT UNTIL FEBRUARY 1, 1994, DO NOT DISCARD THE PREVIOUS PAGES CONTAINING THE REQUIREMENTS SPECIFIED ABOVE UNTIL THIS FUTURE EFFECTIVE DATE.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this standard unless the applicant specifically requests that the product be judged under the current requirements. However, should the applicant elect this option, it should be noted that compliance with all the requirements in this standard will be required as a condition of continued Listing and Follow-Up Services after the effective date and understanding of this should be signified in writing.

The new and revised requirements were originally published as revisions to the First edition of UL 183. These requirements are now issued for, and renumbered in accordance with, the Second edition of UL 183.

Attention is directed to the note on the title page of this standard outlining the procedure to be followed to retain the approved text of ANSI/UL 183-1993.

Revised and/or additional pages may be issued from time to time.

(Continued On Overleaf)

(9)

August 20, 1993 – UL 183

With the inclusion of the accompanying material, the standard consists of pages dated as shown in the following checklist:

Page	Date
1	August 19, 1993 (Reprinted: August 20, 1993)
2	—
3	August 20, 1993
4 – 6	August 19, 1993
7	August 20, 1993
8 – 20	August 19, 1993
21, 22	August 20, 1993
A1	August 19, 1993

AUGUST 19, 1993
(Title Page Reprinted: August 20, 1993)



1

UL 183

Standard for
Manufactured Wiring Systems

First Edition – October, 1984

Second Edition

August 19, 1993

Approval as an American National Standard (ANSI) covers the numbered paragraphs on pages dated August 19, 1993. These pages should not be discarded when revised or additional pages are issued if it is desired to retain the ANSI approved text.

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

Approved as ANSI/UL 183-1986, August 26, 1986
Approved as ANSI/UL 183-1993, March 9, 1993

Revisions of this standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest published set of revision pages.

ISBN 1-55989-448-2

COPYRIGHT © 1984, 1993 UNDERWRITERS LABORATORIES INC.

UL's Standards for Safety are copyrighted to protect UL's publication rights, not to restrict their use in product design or evaluation. See paragraph E of the Foreword.

(01 – 08/19/93 – 08/20/93)

CONTENTS**FOREWORD****INTRODUCTION**

1 Scope	5
2 Glossary	5
3 General	6
4 Installation and Operating Instructions	6

CONSTRUCTION

5 General	6
6 Connecting Cable and Flexible Metal Conduit	7
7 Mechanical Assembly and Enclosure	7
8 Protection Against Corrosion	9
9 Field Wiring	9
10 Internal Wiring	10
11 Splices and Connections	10
12 Grounding	10
13 Mating Connectors	11
14 Strain Relief	11
15 Spacings	12

PERFORMANCE

16 Temperature Test	12
17 Aging/Creep Test	14
18 Aging/Penetration Test	14
19 Vibration Test	14
20 Pull-Out Test	15
21 Overload Test	15
22 Conductor-Secureness Test	16
23 Grounding-Impedance Test	17
24 Dielectric Voltage-Withstand Test	18

MANUFACTURING AND PRODUCTION TESTS

25 Grounding-Continuity Test	19
26 Dielectric Voltage-Withstand Test	19

MARKING

27 Details	20
28 Installation and Operating Instructions	22

APPENDIX A

Standards for Components	A1
--------------------------------	----

FOREWORD

A. This Standard contains basic requirements for products covered by Underwriters Laboratories Inc. (UL) under its Follow-Up Service for this category within the limitations given below and in the Scope section of this Standard. These requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.

B. The observance of the requirements of this Standard by a manufacturer is one of the conditions of the continued coverage of the manufacturer's product.

C. A product which complies with the text of this Standard will not necessarily be judged to comply with the Standard if, when examined and tested, it is found to have other features which impair the level of safety contemplated by these requirements.

D. A product employing materials or having forms of construction differing from those detailed in the requirements of this Standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be judged to comply with the Standard.

E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgment given with due consideration to the necessary limitations of practical operation and state of the art at the time the Standard is processed. UL shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Standard.

F. Many tests required by the Standards of UL are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.

6 Connecting Cable and Flexible Metal Conduit

6.1 Cable shall be Type AC or Type MC, having No. 10 AWG (5.3 mm²) or No. 12 AWG (3.3 mm²) insulated copper ungrounded circuit conductors nominally rated 600 volts. A bare or insulated copper grounding conductor equivalent in size to the ungrounded circuit conductor shall also be provided.

Exception No. 1: A fixture tap not longer than 6 feet (1.83 m) and intended for connection to a single fixture may contain conductors smaller than No. 12 AWG but not smaller than No. 18 AWG.

Exception No. 2: Conductors for use in remote control, signaling, or communications circuits may be smaller than No. 12 AWG.

Exception No. 3: The grounded circuit conductor of type MC or type AC cable may be larger in size than the other conductors provided the grounded circuit conductor does not exceed No. 10 AWG (5.3 mm²).

6.1 revised August 20, 1993

6.2 Flexible metal conduit shall be 3/8 inch (9.5 mm) or larger trade size provided with No. 10 AWG (5.3 mm²) or No. 12 AWG (3.3 mm²) insulated copper conductors and an insulated or uninsulated copper-grounding conductor equivalent in size to the ungrounded circuit conductor.

Exception No. 1: Conductors complying with Exception No. 1 or Exception No. 2 of 6.1 may be smaller than No. 12 AWG.

Exception No. 2: The grounded circuit conductor may be larger in size than the other conductors provided the grounded circuit conductor does not exceed size 10 AWG (5.3 mm²).

6.2 revised August 20, 1993

6.3 Insulated conductors shall have a minimum temperature rating of 75°C (167°F).

6.4 The connectors used with cable or conduit shall effectively close any openings in the connection.

7 Mechanical Assembly and Enclosure

7.1 A fitting or other component shall be prevented from turning, loosening, or otherwise becoming disengaged from its mounting means.

7.2 The means by which the turning or loosening is prevented is to include more than friction between surfaces.

7.3 A manufactured wiring system may be shipped from the factory unassembled or disassembled to the degree necessary to facilitate shipment, if the following conditions are met:

a) The manufactured wiring system is constructed so that field assembly can be accomplished without drilling, cutting, crimping, or performing other operations requiring the use of tools for other than field-wiring connections.

b) The relationship between the current-carrying parts is established at the time of manufacture, and is not dependent upon installation personnel.

7.4 A junction box or similar device made of sheet metal shall have a thickness not less than the value specified in Table 7.1, unless investigated and found acceptable for the application.

Table 7.1
Thickness of sheet metal for enclosures

Maximum area of any surface, square-inches (cm ²)	Maximum dimension, inches (mm)	Minimum thickness, inch (mm)					
		Steel				Copper, brass, or aluminum	
		Without supporting frame		With supporting frame or equivalent reinforcing		Without supporting frame	With supporting frame or equivalent reinforcing
		Zinc-coated	Uncoated ^a	Zinc-coated	Uncoated ^a		
6 ^b (38.7)	3 (76.2)	0.023 (0.54)	0.020 (0.51)	0.023 (0.54)	0.020 (0.51)	0.023 (0.54)	0.023 (0.54)
36 (232.2)	8 (203.2)	0.029 (0.74)	0.026 (0.66)	0.023 (0.54)	0.020 (0.51)	0.036 (0.91)	0.029 (0.74)
90 (580.5)	12 (304.8)	0.034 (0.85)	0.032 (0.81)	0.023 (0.54)	0.020 (0.51)	0.045 (1.10)	0.029 (0.74)
135 (870.7)	18 (457.2)	0.045 (1.10)	0.042 (1.07)	0.034 (0.85)	0.032 (0.81)	0.058 (1.48)	0.045 (1.10)
360 (2322)	24 (609.6)	0.056 (1.40)	0.053 (1.35)	0.045 (1.10)	0.042 (1.07)	0.075 (1.88)	0.058 (1.48)
1200 (7740)	48 (1219.2)	0.070 (1.78)	0.067 (1.71)	0.056 (1.40)	0.053 (1.35)	0.095 (2.40)	0.075 (1.88)
1500 (9675)	60 (1524.0)	0.097 (2.44)	0.093 (2.37)	0.056 (1.40)	0.053 (1.35)	0.122 (3.10)	0.075 (1.88)
Over 1500 (9675)	—	0.126 (3.10)	0.123 (3.09)	0.056 (1.40)	0.053 (1.35)	0.153 (3.88)	0.075 (1.88)

^a Including stainless steel.

^b Volume of enclosure not more than 12 cubic inches (196.64 cm³)

7.5 For an unreinforced, flat surface, cast metal shall not be less than 1/8 inch (3.2 mm) thick, malleable iron shall not be less than 3/32 inch (2.4 mm) thick, and die-cast metal shall not be less than 5/64 inch (2.0 mm) thick.

Exception: Metal of lesser thickness but not less than 3/32 inch, 1/16 inch (1.6 mm), and 3/64 inch (1.2 mm), respectively, may be acceptable provided the surface under consideration is:

- Curved, ribbed, or otherwise reinforced to provide mechanical strength equivalent to that required; or
- Of a size or shape that provides mechanical strength equivalent to that required.

7.6 An enclosure shall be constructed as follows:

- If intended for use in ducts or plenums, there shall be no openings.
- If not intended for use in ducts or plenums, openings in the enclosure that are not closed during the assembly shall comply with the following:
 - The largest dimension of an opening shall not be more than 1/4 inch (6.4 mm) and the smallest dimension shall not be more than 1/16 inch (1.6 mm);
 - There shall be a maximum of five openings in any one side or end of the enclosure and the total area of all openings shall not be more than 0.2 square inch (1.3 cm²); and
 - There shall be a maximum of 15 openings in the enclosure and the total area of all openings shall not be more than 0.5 square inch (3.2 cm²).

27.3 Each manufactured-wiring-system component may also be marked:

- a) "Acceptable for use in ducts or plenums" or the equivalent, if the component complies with 7.6(a); or
- b) "Acceptable for use in air-handling spaces other than ducts or plenums" or the equivalent, if the component does not comply with 7.6(a), but complies with 7.6(b).

27.4 Equipment having wire connectors for field-wiring shall be marked near the connector with one of the following markings as applicable:

- a) "Use Copper Conductors Only" if the connector is acceptable only for connection to copper wire.
- b) "Use Aluminum Conductors Only" if the connector is acceptable only for connection to aluminum wire.
- c) "Use Copper or Aluminum Conductors" or "Use Copper, Copper-Clad Aluminum, or Aluminum Conductors" if the connector is acceptable for connection to either copper or aluminum wire.
- d) "Use Copper-Clad Aluminum or Copper Conductors" if the connector is acceptable for connection to either copper or copper-clad aluminum wire.

27.5 All required markings shall be permanent diestamped, ink-stamped, or paint-stenciled lettering. Adhesive-attached labels shall comply with the applicable portion of the requirements in the Standard for Marking and Labeling Systems, UL 969. The minimum letter height shall be 3/32 inch (2.4 mm) when measured using letters, such as B, L, and H. A contrasting background shall be provided for legibility.

27.6 The individual letters of the first word of a cautionary marking, such as "WARNING" or "CAUTION" shall be larger than the letters of the following statement, and shall not be less than 7/64 inch (2.8 mm) high.

27.7 Each power-feed assembly shall be marked to indicate the type and rating of the intended branch-supply circuit.

27.8 A bidirectional system shall be marked "WARNING: Risk of fire or electric shock," and the following or the equivalent: "Do not electrically connect to more than one source of supply. Always determine that the wiring assembly is electrically connected to one and only one source of supply." The warning shall be located:

- a) On or adjacent to each connector and visible from either side; or
- b) On each connector.

27.9 Each manufactured-wiring-system component that is intended to be connected by armored cable or flexible metal conduit, shall be marked to indicate the type of armored cable or flexible metal conduit to be used.

27.10 Each manufactured wiring system shall be marked to identify the type of cable or conduit employed in the system.

Added 27.10 effective February 1, 1994

28 Installation and Operating Instructions

28.1 Detailed instructions shall be provided for the wiring of each assembly in which any wiring is intended for field connection.

28.2 Detailed instructions shall be provided for the field assembly into recommended configurations.