

**Underwriters Laboratories Inc.®**A not-for-profit organization dedicated to public safety
and committed to quality service**September 6, 1994****Revision pages for****Standard for****Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures****UL 1066, Second Edition**

Attached to this transmittal notice is a revision of the Second edition of UL 1066.

A CHANGE ON A PAGE DATED SEPTEMBER 6, 1994 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.

The new and revised requirements are substantially in accordance with UL's bulletin on this subject dated February 7, 1994. The bulletin is now obsolete and may be discarded.

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UL 1066

Standard for

**Low-Voltage AC and DC Power Circuit
Breakers Used in Enclosures**

First Edition – January, 1985

Second Edition

March 30, 1993

Approval as an American National Standard (ANSI) covers the numbered paragraphs on pages dated March 30, 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.

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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.

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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.

INTRODUCTION

1 Scope

1.1 These requirements cover low-voltage ac power circuit breakers as follows:

- a) Stationary-mounted or drawout-mounted types,
- b) 2-pole and 3-pole constructions,
- c) Manually operated or power operated, and
- d) With or without electromechanical or solid-state type trip device.

1.2 These requirements apply to drawout-mounted type low-voltage ac integrally fused power circuit breakers, consisting of low-voltage ac power circuit breakers with integral current limiters or fuses.

1.3 These requirements apply to low-voltage ac fuse draw-outs consisting of current limiters or fuses in a drawout assembly intended to be connected in series with a low-voltage ac power circuit breaker to form a fused circuit breaker.

1.4 These requirements apply to general purpose type low-voltage dc power circuit breakers.

1.5 These requirements cover equipment intended for use in ordinary locations in accordance with the National Electrical Code.

1.6 These requirements are intended to supplement and be used in conjunction with the:

- a) Standard for Low-Voltage AC Power Circuit Breakers Used In Enclosures, ANSI/IEEE C37.13-1990,
- b) Standard for Low-Voltage DC Power Circuit Breakers Used In Enclosures, ANSI/IEEE C37.14-1979 (R1990),
- c) Standard for Metal-Enclosed Low-Voltage Power Circuit-Breaker Switchgear, ANSI/IEEE C37.20.1-1993,
- d) Test Procedures for Low-Voltage AC Power Circuit Breakers Used In Enclosures, ANSI C37.50-1989, and
- e) Conformance Testing of Metal-Enclosed Low-Voltage AC Power Circuit Breaker Switchgear Assemblies, ANSI C37.51-1989.

1.6 revised September 6, 1994

1.7 These requirements cover equipment rated 600 V or less nominal, 635 V maximum ac and 300 V maximum dc.

1.8 This Standard does not apply to molded-case circuit breakers.

1.9 These circuit breakers are intended for installation in circuit breaker enclosures, switchboards (switchgear), panelboards, and the like. Drawout-mounted devices are intended for use with specific adapters or receiving equipment. The acceptability of the combination of a circuit breaker with respect to any overall enclosure will be determined when the complete product is considered.

1.10 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this Standard, and that involves a risk of fire, electric shock, or injury to persons shall be evaluated using the appropriate additional component and end-product requirements as determined necessary to maintain the acceptable level of safety as originally anticipated by the intent of this Standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this Standard cannot be judged to comply with this Standard. Where considered appropriate, revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this Standard.

Paragraph 1.10 revised September 6, 1994

2 General

2.1 The requirements in this standard shall be applied in addition to those contained in the following documents:

- a) The Standard for Low-Voltage AC Power Circuit Breakers Used In Enclosures, ANSI/IEEE C37.13–1990,
- b) The Standard for Low-Voltage DC Power Circuit Breakers Used In Enclosures, ANSI/IEEE C37.14–1979 (R1990),
- c) The Test Procedures for Low-Voltage AC Power Circuit Breakers Used In Enclosures, ANSI C37.50–1989, and
- d) The Standard for Conformance Testing of Metal-Enclosed Low-Voltage AC Power Circuit Breaker Switchgear Assemblies, ANSI C37.51–1989.

2.2 The term circuit breaker as used in this standard means low-voltage power circuit breaker, both the ac and dc types. When a requirement applies specifically to either an ac or dc type, but not both, the term ac circuit breaker or dc circuit breaker is used. The term fused circuit breaker is used for an integrally fused power circuit breaker or the combination of a fuse drawout and a circuit breaker.

2.3 Reference in this standard is made by designation only to the following American National Standards.

Designation	Title
ANSI/IEEE C37.13–1990	Standard for Low-Voltage AC Power Circuit Breakers Used in Enclosures
ANSI/IEEE C37.14–1979 (R1990)	Standard for Low-Voltage DC Power Circuit Breakers Used in Enclosures
ANSI C37.16–1988	Preferred Ratings, Related Requirements, and Application Recommendations for Low-Voltage Power Circuit Breakers and AC Power Circuit Protectors
ANSI C37.17–1979 (R1988)	Standard for Trip Devices for AC and General Purpose DC Low-Voltage Power Circuit Breakers
ANSI/IEEE C37.20.1–1993	Standard for Metal-Enclosed Low-Voltage Power Circuit-Breaker Switchgear
ANSI C37.50–1989	Test Procedures for Low-Voltage AC Power Circuit Breakers Used in Enclosures
ANSI C37.51–1989	Conformance Testing of Metal-Enclosed Low-Voltage AC Power Circuit Breaker Switchgear Assemblies
ANSI/IEEE C37.100–1992	Definitions for Power Switchgear

2.3 revised September 6, 1994

2.4 The terms used in this standard are as indicated in ANSI/IEEE C37.100–1992.

2.5 ADAPTER – Inasmuch as an adapter is designed to interface between a drawout-mounted device and the receiving devices – such as individual enclosures, deadfront switchboards, and panelboards – an adapter is to be investigated in conjunction with the intended drawout-mounted device.

13 Interlocks

13.1 Mechanical interlocks shall be provided for draw-out type devices to provide the functions outlined in 6.11 – 6.11.5 of ANSI/IEEE C37.20.1–1993. The interlock mechanism shall be on the draw-out device, the receiving adapter, or a combination of the two.

13.1 revised September 6, 1994

14 Control Circuit Wiring

14.1 The internal wiring of control circuits shall consist of general use wire or appliance wiring material (AWM) acceptable for the particular application, when considered with respect to the temperature and voltage and conditions of service to which the wiring is likely to be subjected.

14.2 Wireways shall be smooth and entirely free from sharp edges, burrs, fins, moving parts and the like, which may cause abrasion of the insulation on conductors.

14.3 A splice, where used, shall be provided with insulation equivalent to that of the wires involved.

15 Control Circuit Field Wiring Connections

15.1 DRAWOUT-MOUNTED DEVICES – Secondary disconnects shall be provided such that control circuits are not connected when the device is in the "disconnected" position. Secondary disconnects are to be connected in the "connected" and "test" positions. The acceptability of the secondary disconnects shall be determined by tests as referred to or described in this standard.

15.2 STATIONARY-MOUNTED DEVICES – Terminals or bus connections shall be provided for the connection of wiring to stationary-mounted devices, including an accessory.

15.3 For terminal connections, pressure terminal connectors shall be used, except that for a No. 10 AWG or smaller wire, the parts to which wiring connections are made may consist of clamps or wire-binding screws with terminal plates having upturned lugs or the equivalent to hold the wires in position.

15.4 A wire-binding screw to which field-wiring connections are made shall not be smaller than No. 8, except that a No. 6 or larger screw may be used for a terminal to which No. 14 AWG or smaller wire is intended to be connected.

15.5 A terminal plate tapped for a wire-binding screw shall be of metal not less than 0.030 inch (0.76 mm) thick for a No. 14 AWG or smaller wire, and not less than 0.050 inch (1.27 mm) thick for a wire larger than No. 14 AWG. In either case, there shall not be fewer than two full threads in the metal.

Exception: A terminal plate formed from stock having the minimum thickness, may have the metal extruded at the tapped hole for the binding screw to provide two full threads. Two full threads are not required if fewer threads result in a sufficiently secure connection in which the threads will not strip upon the application of a 20 lb-in (2.3 N·m) tightening torque.

15.6 A wire-binding screw shall thread into metal.

PERFORMANCE

16 General

16.1 The performance requirements for products covered by this standard, other than those presented in this standard, are covered in the American National Standards as indicated in Table 16.1.

Table 16.1
Product ANSI standards

Product	Standard designation
DC Circuit Breakers	ANSI/IEEE C37.14-1979 (R1990)
AC Circuit Breakers	ANSI/IEEE C37.13-1990 and ANSI C37.50-1989
Fuse Draw-outs	See 16.2
Trip Devices	ANSI C37.50-1989 and ANSI C37.17-1979 (R1988)
Accessory Devices ^a	ANSI C37.50-1989
^a Test requirements for accessory devices are contained in Section 4 of ANSI C37.50-1989	

16.2 A fuse draw-out is to be tested in combination with the specific circuit breaker with which it is intended to be used. Test Sequence V from ANSI C37.50-1989 is to be performed with the two elements housed in separate enclosures (adaptors). Fuses are to be selected in accordance with 16.3 – 16.5.

16.3 Fused circuit breakers employing current limiters shall be tested with the specific type current limiter it is intended to employ, or with fuses selected in accordance with 16.4 and 16.5. The specific type shall be constructed so that a standard fuse cannot replace it without deliberately defeating a non-interchangeability feature.

16.4 Fused circuit breakers employing standard fuses shall be tested with fuses having characteristics representing the peak let-through current (I_p) and maximum I^2t associated with the maximum rated fuses the device is constructed to accept. Each of these fuses is to be of such characteristics that, when tested on a single phase circuit, it will permit a peak let-through current (I_p) and a maximum I^2t of not less than the corresponding value specified in the requirements for the current and voltage rating of the class fuse intended for use in the device being tested. To obtain the required values of these characteristics, it may be necessary to employ a fuse having a current rating larger than that of the fuse that the device accommodates and of a different class. If the fuse cannot be physically accommodated, it is to be mounted externally and dummy fuses mounted inside in the fuse clip assemblies.

16.5 Fuses, referred to in 16.4, used for tests are to be selected from a lot from which one sample has been selected and calibrated to determine that its I^2t and I_p characteristics comply with the prescribed values called for in 16.4.

SUPPLEMENT SB – CLASSIFIED TRIP DEVICES FOR USE WITH LOW-VOLTAGE AC POWER CIRCUIT BREAKERS**INTRODUCTION****SB1 Scope**

Section SB1 added September 6, 1994

SB1.1 These requirements cover classified trip devices intended for use as replacements for trip devices provided with circuit breakers.

SB1.2 These requirements are intended for use in conjunction with the Requirements for Conversion of Power Switchgear Equipment, IEEE C37.59.

CONSTRUCTION**SB2 General**

Section SB2 added September 6, 1994

SB2.1 A classified trip device shall comply with the requirements in this standard and also with the applicable requirements of Trip Devices for AC and General Purpose DC Low-Voltage Power Circuit Breakers, ANSI C37.17.

PERFORMANCE**SB3 General**

Section SB3 added September 6, 1994

SB3.1 A classified trip device shall comply with the requirements of ANSI C37.17 and Test Procedures for Low-Voltage AC Power Circuit Breakers Used in Enclosures, ANSI C37.50 when installed on a circuit breaker.

SB3.2 Tests shall be performed to demonstrate that the trip device operates to meet both the requirements of ANSI C37.17 and the manufacturers operating curve.

SB3.3 Tests shall be performed as described in Section 3.9.4.5 of ANSI C37.50 to demonstrate that the trip device causes the host circuit breaker to trip when short circuit currents are present and continues to function following these tests.

MARKINGS**SB4 General**

Section SB4 added September 6, 1994

SB4.1 Each trip device shall be marked with the manufacturers name, address, type or catalog designation and ratings as appropriate.

MANUFACTURING AND PRODUCTION-LINE TESTS**SB5 General**

Section SB5 added September 6, 1994

SB5.1 Each trip device shall be tested in accordance with Section 6.2.2 of ANSI C37.50.

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