



Marking and Application Guide

MOLDED CASE CIRCUIT BREAKERS

JANUARY 2012

PREFACE

UL has developed the Molded-Case Circuit Breaker (MCCB) Marking Guide for electrical inspectors, electric utilities, contractors, installers, users, designers, and other interested parties to aid in understanding MCCBs and the applicable codes and standards in order to facilitate a reasonably safe and code-compliant installation of MCCBs. These circuit breakers are intended to be installed in accordance with the *National Electrical Code® (NEC®)* and their listing. These markings are required by UL 489, and are part of the listing.

The products covered by this Guide are:

- Circuit Breaker Adapters
- Circuit Breaker Accessories
- Circuit Breaker and Surge-protective Devices
- Current Limiters
- Circuit Breakers for use in Communications Equipment
- Molded-Case Circuit Breakers
- Combination Type Arc-Fault Circuit Interrupters
- Branch Feeder Type Arc-Fault Circuit Interrupters
- Circuit Breakers with Equipment Ground Fault Protection
- Fused Circuit Breakers
- Circuit Breaker and Ground Fault Circuit Interrupters
- Circuit Protectors
- Circuit Breakers for use in Photovoltaic Systems

Complete information regarding the provision of markings and instructions for these circuit breakers is contained in the *Standard for Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit Breaker Enclosures*, UL 489. References to the *National Electrical Code® (NEC®)* are to the 2011 edition.

UL Marking and Application Guides are updated as necessary due to new product development, changes in the codes, or the need for clarification. To confirm the current status of any UL Marking Guide, please consult the Code Authorities page of the UL Web Site at; www.ul.com/codeauthorities.

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TABLE OF CONTENTS

TOPIC	PAGE
INTRODUCTION	05
GENERAL	
1. Type Designation	07
2. Manufacturer's Name	
3. Voltage Rating	
4. Ampere Rating.....	08
5. Line and Load Identification	
POSITION INDICATION	
6. On and Off (Open and Closed)	08
7. Trip and Reset	
8. Electrical Operation (On and Off)	
9. Electrical Operation (Trip and Reset)	
INTERCHANGEABLE TRIP UNITS	
10. Manufacturer's Name	08
11. Ampere Rating (Trip Unit)	
12. Frame Designation	
13. Magnetic Settings	
INTERRUPTING RATINGS	
14. Ratings	09
TERMINATIONS	
15. Cu-Al Wire	09
16. Small Size Wire	
17. Tightening Torque	
18. Maximum Wire Size	
19. Multiple Conductor Connectors	
20. 60/75°C Wire	
21. Separately Shipped Connectors	
22. Cable Connection Only	10
23. Bus Bar Sizes	
ADJUSTABLE TRIP	
24. Instantaneous Trip	10
25. Type A and Type B	
26. Adjustable Controls	
SPECIAL MARKING	
27. Non-Conducting Enclosure	10
28. Ventilated Enclosure	
29. 40°C	
30. Current Limiting	11
31. Class CTL	
32. "Delta"	
33. 2-Pole — 3-Phase Rated	

34. 3-Pole — 1-Phase Rated	
35. 4-Pole — 3-Phase Rated	
36. Multi-Wire Circuit	11
37. DC Rated 3-Pole	
38. 100 Percent Continuous Rated	12
39. “SWD”	
40. Independent Trip	
41. Special Characteristics	
42. For Replacement Not CTL	
43. Special Purpose Not General	
44. “HID”	
45. Remotely Operated Circuit Breaker	
FUSED CIRCUIT BREAKERS	
46. Line and Load Identification	12
47. Identification of Fuses	
48. No Open Fuse Tripping	13
49. General Markings	
CIRCUIT BREAKER/GROUND FAULT CIRCUIT INTERRUPTER	
50. “Test” Function	13
51. “Class A” Marking	
52. Instructions	
53. Terminal Identification	
54. General Markings	
CIRCUIT BREAKER/EQUIPMENT GROUND FAULT PROTECTION	
55. “Test” Function	13
56. Trip Level Marking	
57. Instructions	
58. Terminal Identification	
59. Use Marking	
60. General Markings	14
CIRCUIT BREAKER SURGE- PROTECTIVE DEVICE	
61. Types	14
62. Voltage Protection Rating	
63. Maximum Continuous Operating Voltage Rating	
64. Nominal Discharge Current (In) Rating	
65. Short-circuit Current Rating (SCCR)	
66. General Markings	
CURRENT LIMITERS (ACCESSORY HIGH-FAULT PROTECTORS)	
67. Type Designation	14
68. Manufacturer’s Name	
69. Terminations	
70. Circuit Breaker	
71. Interrupting Rating	
ACCESSORIES	
72. Ratings	15

73. Shunt Trip	
74. Separately Shipped	
75. External Dropping Resistor	15

CIRCUIT BREAKER ADAPTERS

76. Type Designation	15
77. Manufacturer’s Name	
78. Terminations	
79. Circuit Breaker	
80. Instructions	

CIRCUIT PROTECTORS

81. Manufacturer’s Name	16
82. Voltage Rating	
83. Ampere Rating	
84. Reset Instructions	

CIRCUIT BREAKER FOR USE IN COMMUNICATIONS EQUIPMENT

85. Ambient Operating Temperature	16
86. Wire Insulation Temperature Rating	
87. Same Polarity	
88. General Markings	

MOLDED CASE CIRCUIT BREAKERS ALSO LISTED AS COMBINATION TYPE ARC-FAULT CIRCUIT INTERRUPTERS

89. Device Identifier	16
90. “TEST” Function	
91. Instructions	17
92. General Markings	

MOLDED CASE CIRCUIT BREAKERS ALSO LISTED AS BRANCH/FEEDER TYPE ARC FAULT CIRCUIT INTERRUPTERS

93. Device Identifier	17
94. “TEST” Function	
95. Instructions	
96. General Markings	

CLASSIFIED MOLDED CASE CIRCUIT BREAKERS FOR USE IN SPECIFIED EQUIPMENT

97. Classified Only and Compatibility List	17
98. Classified and Listed Compatibility List	
99. Compatibility List	
100. Classification and Listing Mark	18

MOLDED CASE CIRCUIT BREAKERS FOR USE IN PHOTOVOLTAIC SYSTEMS

102. Voltage Rating	18
103. PV marking	
104. Multipole PV Circuit Breakers	
105. Temperature Rating	
106. Wire Range and Type	
107. General	

Molded Case Circuit Breakers
Marking and Application Guide

LOCATION	
General	18
Location Codes	19
CIRCUIT BREAKER MARKINGS	20
APPENDIX A:	
UL Molded Case Circuit Breaker Product Categories	23

INTRODUCTION

USE OF THIS GUIDE

This guide is intended to assist regulatory authorities, designers, and installers in determining the suitability of specific molded case circuit breakers in a particular installation and use, and to address concerns related to fire and shock hazards.

Products are Listed or Classified by UL under an appropriate product category. A four-letter code (shown in parenthesis) following every category title in this guide is the UL product category code designation. A list of molded case circuit breaker product categories evaluated by UL can be found in Appendix A.

Each UL product category code provides a direct link to the Guide Information for the product category. The Guide Information includes the scope of the products covered, information relating to limitations or special conditions applying to the product, the requirements used for the investigation of the products, installation and use information, and information on product markings and the UL Mark to be used on the product. Guide information is available in the UL White Book and online at www.ul.com/database.

The product markings identified in this guide do not include every possible marking that could be provided either on a product or in its installation or operation instructions. The purpose of these markings is to provide you with an indication of the type of text and location of markings that address features that may be critical in determining if a product is certified and / or if it is installed correctly. Refer to the specific Guide Information for the product category for additional marking information.

Additional information can be found at www.ul.com.

INFORMATION ON LISTING VERSUS CLASSIFICATION

Most codes and regulations require the certification of this equipment to applicable safety-related standards. They also may require this equipment to be certified to energy performance standards as well. Products that are certified to safety-related standards have been evaluated with regard to all reasonably foreseeable safety-related hazards, including fire, electrical shock and mechanical hazards. Such products are termed “UL Certified” or “UL Listed.” Products that are certified to a limited range of hazards, or for use under specific conditions are termed “UL Classified”.

It is important to distinguish the difference between “UL Certified” or “UL Listed” and “UL Classified” and the relation these terms have with the term “listed,” as used in various codes. The term “listed” in the codes generally indicates that the product is required to be evaluated in accordance with the appropriate standard(s) by an independent third party certification organization such as UL. The term “listed” in the codes should not be confused with the term “UL Listed,” as explained above. It is important to recognize that not all certification agencies make this distinction in their certification services.

INFORMATION ON UL MARKS

There are several types of UL Marks that can be found on molded case circuit breakers. General information on each of these Marks is provided below. Each has its own specific meaning and significance. The only way to determine if a product has been certified by UL is to look for the UL Mark on the product itself.

The UL Mark on a product means that UL has tested and evaluated representative samples of that product and determined that they meet the requirements in the applicable standard(s). Under a variety of UL programs, certified products are periodically checked by UL at the manufacturing facility to determine that they continue to comply with the standard(s).

The UL Marks may only be used on, or in connection with products certified by UL, and under the terms of a written agreement between the manufacturer and UL.

UL Listing Mark

This is one of the most common UL Marks. If a product carries this Mark, it means UL found that representative samples of this product met UL's *safety* requirements. These requirements are primarily based on UL's own published Standards for Safety, or other recognized third party standards. The UL Listed Mark includes the UL symbol, the word "Listed," the product or category name, and a control number assigned by UL.





UL Classification Mark

This Mark appears on representative samples of products that UL has evaluated but only with respect to specific properties, a limited range of hazards, or suitability for use under limited or special conditions. The UL Classified Mark includes the UL symbol, the word "Classified," a statement of the scope of evaluation, the product or category name, and a control number assigned by UL.



GENERAL

- 1. Type Designation**—All circuit breakers are marked with their type designation. Normally, this marking also includes a catalog number, because most often the location of additional suffix letters and/or numbers in the catalog number provides additional information on ratings. If the full catalog number is marked, the type designation marking is optional.
- 2. Manufacturer's Name** — All circuit breakers are marked with a name, trademark or other recognized means for identifying the organization responsible for the device. Usually, this is the manufacturer—for other references, the marking guide indicates the manufacturer's name.
- 3. Voltage Rating** — All circuit breakers are marked with a voltage rating, including: 60, 125, 125/250, 160, 250, 500 and 600 volts for dc; and 120, 127, 120/240, 240, 277, 347, 480Y/277, 480, 600Y/347 and 600 volts for ac. All circuit breakers are marked with the symbols  for AC,  for DC, or both, as applicable. For ac voltage ratings other than 60 Hz, the frequency is marked. Additional wording may be provided.

Circuit breakers for use in Communications Equipment may also carry ratings of 30, 65 or 80 Volts dc.

Two-pole independent-trip breakers and single-pole breakers with handle ties that are rated 120/240 V ac have been investigated for use in line-to-line single-phase circuits or line-to-line branch circuits connected to 3-phase, 4-wire systems, provided the systems have a grounded neutral and the voltage to ground does not exceed 120 V.

Two-pole independent-trip breakers and single-pole breakers with handle ties that are rated 125/250 V dc have been investigated for use in line-to-line connected 3-wire dc circuits supplied from a system with a grounded neutral, where the voltage to ground does not exceed 125 V.

Two-pole independent-trip breakers and single-pole breakers with handle ties that are rated 125/250 V (both ac and dc) have been investigated for use in accordance with either of the above two paragraphs, as applicable.

Two- and three-pole common-trip breakers rated 120/240V ac are intended for use on 1-phase, 3-wire circuits, where the voltage to ground does not exceed 120 V.

Two- and three-pole common-trip breakers rated 125/250 V or 125/250 V dc are intended for use on 1-phase and dc, 3-wire circuits, where the voltage to ground does not exceed 125 V.

Circuit breakers with a single voltage rating are intended for use in circuits where the circuit voltage and the voltage to ground do not exceed the voltage rating of the breaker.

“Slant (or slash)-rated” breakers with a rating such as 480Y/277 V are intended for use in circuits where the circuit voltage does not exceed the higher of the two voltages and the voltage to ground does not exceed the lower of the two voltages.

Based on the preceding paragraphs, “slant-rated” breakers (120/240, 208Y/120 V, etc., as opposed to 240, 480 V, etc.) are not intended for use on “slant-rated” delta systems. For example, a 3-pole, 120/240 V breaker is not intended for use on a 240/120 V, 3-phase, 4-wire, delta system, because on the high leg, the voltage to neutral is 208 V. In this instance, a 3-pole, 240 V breaker should be

used.

4. Ampere Rating — All circuit breakers are marked with a current rating. For breakers rated 100 A or less, this marking is required to be on the handle or the escutcheon area of the breaker. If the marking is placed on the handle of the breaker, the numerical value alone is adequate.

5. Line and Load Identification — A circuit breaker may or may not be marked “Line” and “Load.” If it does not have this marking, it is acceptable for reverse connection. A breaker with interchangeable trip units is marked “Line” and “Load,” unless there is no risk of electric shock when changing the trip unit.

POSITION INDICATION

6. On and Off (Open and Closed) — All circuit breakers are marked to indicate whether they are open or closed. This marking is visible without removing the trim or cover. However, if the breaker is enclosed, it may be necessary to open a hinged cover or door.

7. Trip and Reset — If a circuit breaker handle takes an intermediate position when tripped, the breaker is marked to indicate it is tripped. Instructions for resetting the breaker are also required to be marked. These markings are optional if they already appear on the receiving device, for example the panelboard.

8. Electrical Operation (On and Off) — If the “On” and “Off” markings are not readily visible when an electrical operator is installed, the markings appear on the electrical operator.

9. Electrical Operation (Trip and Reset) — The electrical operator may also indicate the “Tripped” position of the circuit breaker.

INTERCHANGEABLE TRIP UNITS

10. Manufacturer’s Name — All interchangeable trip units are marked with the manufacturer’s name, trademark or other recognized means for identifying the manufacturer.

11. Ampere Rating — All interchangeable trip units are marked with their ampere rating. The numerical value alone is sufficient, if the word “amperes” or an appropriate abbreviation appears on the cover next to the trip unit.

12. Frame Designation — All interchangeable trip units are marked with the frames for which they are intended, unless the instructions provided with the trip units instruct the user on the proper use of the trip units.

13. Magnetic Settings — All interchangeable trip units are marked with the minimum and maximum settings for the adjustable magnetic tripping values.

INTERRUPTING RATINGS

14. Ratings — All circuit breakers with an interrupting rating other than 5000 A are marked with their interrupting rating. If the breaker is not marked with an interrupting rating, the interrupting rating for the breaker is 5000 A. The marking includes the words “Interrupting Rating” or “Current Interrupting Rating” and may include “Maximum RMS Symmetrical,” or an abbreviation. If the interrupting rating includes more than one current and associated voltage rating, all values of voltage and corresponding interrupting rating are marked. If more than one interrupting rating is marked, all ratings appear together. No asymmetrical voltage rating may be marked on the breaker. If the marked interrupting rating of the breaker exceeds the marked short circuit rating of the end-use equipment, such as a panelboard, in which the breaker is installed, the interrupting rating of the overall combination is still considered to be the lesser rating marked on the end-use equipment.

TERMINATIONS

15. Cu-Al Wire — All circuit breakers are marked to identify the type of wire for which they are suitable. The marking includes the words “Copper” and/or “Aluminum” or an abbreviation. If the breaker is intended for use with a copper wire only or an aluminum wire only, the marking includes the word “Only.” A breaker intended for use with No. 10-14 AWG solid wire only is marked “No. 10-14 AWG Solid,” or an equivalent wording.

16. Small Size Wire — Circuit breakers rated less than 15A that have been found acceptable for use with 16 or 18 AWG , rated 10A and 7A respectively are so marked. This marking may be included in the marked wire range.

17. Tightening Torque — All circuit breakers are marked with their rated tightening torque for all terminals intended for field wiring. This is a nominal value. If the torque is dependent on wire size, the marking indicates the range of tightening torques for each wire size.

18. Maximum Wire Size — If the terminals of a circuit breaker will not accept the next larger wire size than required for the breaker rating, the breaker or the terminal is marked to indicate the maximum wire size.

19. Multiple Conductor Connectors — If the terminals of a circuit breaker are acceptable for use with multiple connections in one hole, and the breaker is intended for this type of use, the breaker is marked to indicate the proper multiple connections. This is uncommon for breakers—ordinarily, the terminals are suitable for only one wire per hole.

20. 60/75°C Wire — All circuit breakers rated 125 A or less are marked for use with 60° C, 60/75°C or 75°C only wire. This marking indicates the proper wire size for termination in accordance with Table 310.15(B)(16) of the NEC [®]. It is acceptable to use wire with a higher insulation rating if the ampacity is based on the wire temperature rating marked on the breaker. For breakers rated more than 125 A, the proper wire temperature rating is 75°C and it is optional for the breaker to bear this marking.

21. Separately Shipped Connectors — If the wire connectors are not provided with the circuit breaker when shipped from the manufacturer, the breaker is marked to indicate the proper connectors or connector terminal kit for the breaker. The terminal kit indicates the manufacturer’s name or trademark and proper wire size.

22. Cable Connection Only — A circuit breaker rated more than 4000 A and intended for cable connections only is marked accordingly.

23. Bus Bar Sizes — A circuit breaker intended for use with bus bars other than 1000 A/in.² is marked to indicate the minimum size bus bar to which it should be connected. If not marked, the proper bus bar sizes for termination are based on the table shown below:

Circuit Breaker Frame Size, A	Bus Bars per Terminal	
	Number	Size, in.
1600	2	1/4 X 3
2000	2	1/4 X 4
2500	2	1/4 X 5
	or 4	1/4 X 2-1/2
3000	4	1/4 X 4
4000	4	1/4 X 5
5000	6	1/4 X 5
6000	6	1/4 X 6

ADJUSTABLE TRIP

24. Instantaneous Trip — All circuit breakers with an adjustable instantaneous tripping means are marked to indicate at least the minimum and maximum trip settings. This marking can either be in amperes or a percentage of the breaker’s ampere rating. If it is an interchangeable trip unit, the marking may be on the trip unit.

25. Type A and Type B — A Type A adjustable circuit breaker can be repeatedly field adjusted for all changeable characteristics. A Type B adjustable circuit breaker — once set to a particular continuous current rating — cannot be adjusted to a higher value. The Type A breaker is marked with a single ampere rating and percentage, or similar markings, or with current markings for each continuous current adjustment setting. The Type B breaker can be marked with the ampere rating to which it is set. The ampere marking is to be applied by the installer at the time the breaker is set. The notations —Type A and Type B—are not required to be marked on the breaker. They are designations used to determine how to evaluate the breakers.

26. Adjustable Controls — Each control of an adjustable circuit breaker is marked to indicate its function and setting points.

SPECIAL MARKINGS

27. Non-Conducting Enclosure — A circuit breaker not intended for use in a metal enclosure is marked “Suitable for use in a non-conducting enclosure only.”

28. Ventilated Enclosure — A circuit breaker for use in a ventilated enclosure is marked to identify the enclosure or to indicate the proper enclosure size, and location and size of the ventilating openings.

29. 40°C — A thermal-magnetic circuit breaker that is suitable for use in ambients up to 40°C is

marked “40°C.” Circuit breakers with electronic type trip units are not affected by the ambient temperature and are not required to be marked to indicate the suitability. These devices may be used in 40°C ambients unless marked 25°C.

30. Current Limiting — A circuit breaker that meets UL requirements for current limiting is marked “Current Limiting.” The breaker is also marked with the peak current (I_p) and I^2t let-through and related frequency, or to reference a publication available from the manufacturer with this same information. These let-through current curves indicate the let-through currents versus prospective fault current across the range from the threshold level, where the breaker starts to exhibit current limiting characteristics, to the maximum interrupting rating, with at least one intermediate point also indicated. UL’s definition of a current limiting breaker is one that does not use a fusible element and, when operating within its current limiting range, limits the let-through I^2t to less than the I^2t of a 1/2-cycle wave of the available symmetrical current.

31. Class CTL — Circuit breakers for Class CTL panelboards or assemblies are marked “Class CTL” or “CTL.” A Class CTL breaker, because of its size or configuration in conjunction with the physical means provided in Class CTL panelboards, prevents more circuit breaker poles from being installed than the number for which the assembly is designed and rated. A Class CTL panelboard is a circuit limited panelboard. Both “half-sized” and “full-sized” breakers may be marked “Class CTL.”

32. “Delta” — A delta breaker is a 3-pole — 3-phase circuit breaker intended to have two poles connected to a bus structure and a third pole isolated, and is marked “For Replacement Use Only.”

33. 2-Pole — 3-Phase Rated — A 2-pole circuit breaker marked “1-Phase — 3-Phase” or “1Ø — 3Ø” may be used on 3-phase, corner-grounded delta circuits, or on single-phase circuits.

34. 3-Pole — 1-Phase Rated — 3-pole circuit breakers are suitable for use on 3-phase systems only, unless marked to indicate use on 1-phase systems, such as, “For 1-phase connections, use two outside poles,” or an equivalent statement. A 3-pole breaker may be used in place of a 2-pole breaker on a 3-phase system, such as a 2-pole breaker used in a branch circuit that is actually two legs of a 3-phase system, and is acceptable without the 3-pole breaker being specifically marked.

35. 4-Pole — 3-Phase Rated — 4-pole circuit breakers are suitable for use on 3-phase systems where a switched neutral is required. The fourth pole is provided either without overcurrent protection or with overcurrent protection of 50 or 100 percent of the other poles. The fourth (neutral) pole of a 4-pole circuit breaker is marked “Protection – _% In”. The percentage indicated is 0, 50 or 100.

36. Multi-Wire Circuit — A multi-pole circuit breaker intended for use in a multi-wire circuit only is marked with a combination voltage rating only, such as 480Y/277 V ac, provided a 3-pole breaker intended only for use in a single-phase multi-wire circuit includes in its marked voltage rating the term “1-phase” or an equivalent.

37. DC Rated 3-Pole — A 3-pole circuit breaker rated 250 V dc or less is acceptable for use in DC voltage systems, when marked to indicate its DC voltage rating and it is necessary to use two of the poles to control the circuit. Three-pole breakers rated more than 250 V dc are generally intended to be connected with all three poles in series and are marked with a wiring diagram indicating that all three poles should be wired in series.

- 38. 100 Percent Continuous Rated** — Unless otherwise marked for continuous use at 100 percent of its current rating, a circuit breaker is intended for use at no more than 80 percent of its rated current where in normal operation the load will continue for three hours or more. A breaker with a frame size of 250 A or more, or a multi-pole breaker of any current rating greater than 250 V, may be marked to indicate it is suitable for continuous use at 100 percent of its current rating. The marking is “Suitable for continuous operation at 100 percent of rating only if used in a circuit breaker enclosure Type ____ or in a cubicle space _____ by _____ by _____ inches” or an equivalent statement. This type of breaker may also be marked to indicate it is to be used with wire sized for a 75°C conductor with 90°C insulation and used with 90°C wire connectors.
- 39. “SWD”** — A circuit breaker rated 15 or 20 A, 347 V ac or less, may be marked “SWD” and is suitable for switching fluorescent lighting loads on a regular basis.
- 40. Independent Trip** — A 2-pole circuit breaker that does not have an internal common trip feature is marked “Independent Trip” or “No Common Trip.” An external handle tie alone does not qualify as a common trip mechanism — a breaker of this type is marked to indicate it is an independent trip breaker.
- 41. Special Characteristics** — If the proper operation of a circuit breaker depends on a special characteristic, such as polarity or position, the breaker is marked to indicate this characteristic. If this includes a barrier, shield or similar member, the breaker is marked with all the necessary information. If it is necessary to replace a part, such as a barrier or shield, the marking also includes replacement instructions.
- 42. For Replacement Not CTL** — The marking “For replacement use only not CTL assemblies” appears on breakers that do not have means to prevent their installation in Class CTL assemblies. These breakers are intended for replacement in older assemblies still in service, which pre-dates the Class CTL requirements for circuit breakers and panelboards.
- 43. Special Purpose Not General** — Circuit breakers marked “Special purpose not for general use” have special features limiting their suitability to specific applications. Instructions are provided by the manufacturer detailing these applications.
- 44. “HID”** — A circuit breaker rated 50 A maximum, 480 V or less, and intended to switch high intensity discharge (HID) lighting loads on a regular basis is marked “HID.”
- 45. Remotely Operated Circuit Breaker**—A circuit breaker that can be opened remotely, such as by a utility, for purposes of shedding loads. These circuit breakers are marked “Remotely Operated” and are provided with a separate label marked: “Remotely-operated circuit breaker installed in this equipment” with instructions for attaching the label to the equipment.

FUSED CIRCUIT BREAKERS

- 46. Line and Load Identification** — All fused circuit breakers are marked “Line” and “Load.” The “Load” marking is on the same side of the contacts as the fuses or high-fault protectors.
- 47. Identification of Fuses** — All fused circuit breakers are marked to indicate the fuses or high-fault protectors with which they are to be used.

48. No Open Fuse Tripping — Any fused circuit breaker that does not trip automatically on clearing of one or more of the fuses or high-fault protectors is marked “Open Fuse Tripping Not Provided,” or an equivalent statement.

49. General Markings — These circuit breakers are marked as outlined for all breakers. See Items 1-4, 6-7, 14-23, 29-36, 39-42, 45-46 and 72-75.

CIRCUIT BREAKER/GROUND FAULT CIRCUIT INTERRUPTER

50. “Test” Function — The “Test” switch on a circuit breaker and ground fault circuit interrupter (CB/ GFCI) is marked to identify its purpose. When the test switch is depressed, a current simulating a ground fault is caused to flow and this should cause the internal mechanism to function to trip the breaker.

51. “Class A” Marking — All CB/GFCIs are marked “Class A,” indicating that the CB/GFCI has a ground fault trip threshold of 6mA maximum.

52. Instructions — All CB/GFCIs are provided with: instructions for the installer and user, including instructions on the proper use of the supervisory (test) circuit; and the need to test the device at least once a month. Also included in a marking on the CB/GFCI, or in literature supplied with the CB/GFCI, is information indicating that the user is not protected if contact is made with more than one circuit conductor.

53. Terminal Identification — At least three of the four terminals of a single-pole CB/GFCI and all but one of the terminals of a multi-pole CB/GFCI are identified. The terminals to the grounded conductor are white; the terminals for the ungrounded conductors are a contrasting color. The color green cannot be used.

54. General Markings — These circuit breakers are also marked as outlined for all breakers. See Items 1-7, 14-20, 29, 31, and 39-42.

CIRCUIT BREAKER/EQUIPMENT GROUND FAULT PROTECTION

55. “Test” Function — The “Test” button on a circuit breaker with equipment ground fault protection (CB/ EGFP) is marked to identify its purpose. When the test button is depressed, a current simulating a ground fault is caused to flow and this should cause the internal mechanism to function to trip the breaker.

56. Trip Level Marking — All CB/EGFPs are marked to indicate the ground fault trip threshold of the device, in milliamperes.

57. Instructions — All CB/EGFPs are provided with instructions for the installer.

58. Terminal Identification — All but one of a CB/EGFPs terminals are identified. The terminals to the grounded conductor are white or gray; the terminals for ungrounded conductors are a contrasting color. The color green cannot be used.

59. Use Marking — A CB/EGFP shall be marked “Equipment Protection Only”

60. General Markings — These circuit breakers are also marked as outlined for all breakers. See Items 1-7, 14-20, 29, 31, 39-42 and 73-76.

CIRCUIT BREAKER SURGE-PROTECTIVE DEVICE

61. Types – These devices are marked Type 1, 2 or 3 which delineates the appropriate installable location within the electrification system.

62. Voltage Protection Rating — These devices are marked with a surge voltage protection rating.

63. Maximum Continuous Operating Voltage Rating (MCOV) – These devices are marked in volts, for Type 1 and 2 SPDs at both line-to-line and line-to-neutral.

64. Nominal Discharge Current (In) Rating - in amps or kA for Type 1 and 2 SPDs.

65. Short-circuit Current Rating (SCCR) - in amps or kA for Type 1 and 2 SPDs.

66. General Markings — These circuit breakers are also marked as outlined for all circuit breakers. See Items 1-7, 14-21, 29, 31, 39-42, and 43.

CURRENT LIMITERS (ACCESSORY HIGH-FAULT PROTECTORS)

67. Type Designation - All current limiters are marked with their type designation.

68. Manufacturer's Name - All current limiters are marked with the manufacturer's name, trademark, or other recognized means for identifying the manufacturer.

69. Terminations - All current limiters are marked with their wire termination information. See Item 15-22.

70. Circuit Breaker - All current limiters are marked to indicate the circuit breakers with which they are to be used.

71. Interrupting Rating — All current limiters are marked to indicate their interrupting rating for which the current limiter and corresponding circuit breaker were investigated. The marking includes the words "Interrupting Rating" or "Current Interrupting Rating" and may include "Maximum RMS Symmetrical," or an abbreviation. If the interrupting rating includes more than one current and associated voltage rating, all values of voltage and corresponding interrupting rating are marked. If more than one interrupting rating is marked, all ratings appear together.

ACCESSORIES

72. Ratings — All circuit breakers provided with accessories are marked to identify the accessories installed. This includes the accessory type, electrical ratings and proper connections, if the connections are not obvious. The electrical ratings include the voltage rating, and ac or the frequency in Hertz, dc, or both, as appropriate for all accessories. For alarm and auxiliary switches, the marking also includes either an ampere or pilot-duty rating. For shunt trip accessories, over- and under-voltage trip accessories and electrical operators, the marking also includes either an ampere or VA rating.

73. Shunt Trip — A circuit breaker provided with a shunt trip accessory intended for use with ground fault sensing and relaying equipment is marked to indicate the specific equipment with which it is to be used. As an option, it may be marked to indicate the voltage and frequency, or dc, of the tripping circuit; the rated tripping current at rated voltage; and “Suitable for Ground Fault Protection when combined with Class 1 (or manufacturer and catalog number) Ground Fault Sensing and Relaying Equipment,” or an equivalent statement.

74. Separately Shipped — If a circuit breaker and accessory are shipped separately, the accessory is marked to indicate the manufacturer’s name or trademark, catalog number and electrical ratings. Where there is no space for a permanent marking on the accessory, it is marked with some type of identification that references a removable tag or other type of alternate marking. Instructions are furnished with the accessory indicating the specific breakers with which it is to be used. A marking label indicating the installed accessory and its connections is furnished with the accessory, along with instructions indicating that the label should be attached to the breaker when installed. Installation and wiring instructions are also provided unless the proper installation is obvious.

75. External Dropping Resistor — A circuit breaker is marked to indicate when an external dropping resistor is intended to be used between the line terminals of the breaker and the line terminals of an under-voltage trip device. The marking also includes the manufacturer’s name, catalog number and the resistor’s electrical ratings.

CIRCUIT BREAKER ADAPTERS

76. Type Designation — All circuit breaker adapters are marked with their Type designation.

77. Manufacturer’s Name — All circuit breaker adapters are marked with the manufacturer’s name, trademark or other recognized means for identifying the manufacturer.

78. Terminations — All circuit breaker adapters are marked with their wire termination information. See Items 15-22.

79. Circuit Breaker — All circuit breaker adapters are marked to indicate the breakers with which they are to be used.

80. Instructions — All circuit breaker adapters are provided with installation instructions to guide the installer. A marking label indicating the adapter that has been installed is also furnished, along with instructions that the label should be attached to the breaker when installed.

CIRCUIT PROTECTORS

Circuit protectors are designed for installation in standard Edison base fuseholders and intended to provide overcurrent protection for services and branch circuits. They are not provided with manual “On” and “Off” switches, but do have a trip-free manual reset to reclose the circuit after automatic opening from overload or short circuit. They are suitable for use on circuits where the available fault current does not exceed 5000 A RMS symmetrical.

- 81. Manufacturer’s Name** — All circuit protectors are marked with the manufacturer’s name, trademark or other recognized means for identifying the manufacturer.
- 82. Voltage Rating** — All circuit protectors are marked with a voltage rating.
- 83. Ampere Rating** — All circuit protectors are marked with a current rating.
- 84. Reset Instructions** — All circuit protectors are marked with instructions for resetting the protector after it has tripped.

CIRCUIT BREAKERS FOR USE IN COMMUNICATIONS EQUIPMENT

- 85. Ambient Operating Temperature** — Some circuit breakers for use in communications equipment have been investigated for use in ambient air at temperatures greater than 40°C. These circuit breakers are marked with either the intended operating ambient temperature or a range of temperatures.
- 86. Wire Insulation Temperature Rating** — Circuit breakers for use in communications equipment that have been investigated for use in ambient temperatures greater than 40°C and that require use with wire having insulation temperature ratings greater than 75°C are marked with the temperature rating of the wire that should be connected to it. The ampacity of the wire should be as specified for 75°C.
- 87. Same Polarity** — Circuit breakers for use in communications equipment that have accessories are marked “SAME POLARITY” when that is required to maintain spacings between the primary circuit and the accessory circuit.
- 88. General Markings** — These circuit breakers are also marked as outlined for breakers. See items 1-7, and 14-21.

MOLDED CASE CIRCUIT BREAKERS ALSO LISTED AS COMBINATION TYPE ARC-FAULT CIRCUIT INTERRUPTERS

- 89. Device Identifier** — These devices are marked with words “Combination Arc-Fault Circuit Interrupter” or “Combination AFCI” where visible with a dead-front removed while the device is installed so that the device will not be mistaken for a circuit breaker and GFCI.
- 90. “TEST” Function** — The “TEST” switch on an arc-fault circuit interrupter is marked to identify its purpose. When the test switch is depressed, a signal that simulates an arc such that the arc detection circuit or software is caused to detect the simulated arc and this should cause the mechanism to function to trip the breaker.

- 91. Instructions** — Combination Arc-Fault Circuit Interrupters are provided with installation instructions that tell the user the proper method of installing the device.
- 92. General Markings** — These circuit breakers are also marked as outlined for all breakers. See items 1-7,14-21, 29, 31, and 39-42.

MOLDED CASE CIRCUIT BREAKERS ALSO LISTED AS BRANCH/FEEDER TYPE ARC FAULT CIRCUIT INTERRUPTERS

- 93. Device Identifier** — These devices are marked with words “Branch/Feeder Arc-Fault Circuit Interrupter” or “Branch/Feeder AFCI” where visible with a dead-front removed while the device is installed so that the device will not be mistaken for a circuit breaker and GFCI.
- 94. “TEST” Function** — The “TEST” switch on an arc-fault circuit interrupter is marked to identify its purpose. When the test switch is depressed, a signal that simulates an arc such that the arc detection circuit or software is caused to detect the simulated arc and this should cause the mechanism to function to trip the breaker.
- 95. Instructions** — All arc-fault circuit interrupters are provided with instructions for the installer and user, including wiring instructions, correct operation and test instructions.
- 96. General Markings** — These devices are also marked as outlined for all breakers. See 1-7, 14 -21, 29, 31, and 39-42..

CLASSIFIED MOLDED CASE CIRCUIT BREAKERS FOR USE IN SPECIFIED EQUIPMENT

- 97. Classified Only and Compatibility List** - A circuit breaker that is Classified only is marked on the side with the statement:

"Classified for use only in specified panelboards where the available short-circuit current is 10 kA, 120/240 volts ac or less. Do not use in equipment connected to circuits having an available system short-circuit current in excess of 10 kA, 120/240 volts ac. For catalog numbers (or equivalent) of specified panelboards, refer to Publication No. _____ provided with this circuit breaker. If additional information is necessary, contact [Classified circuit breaker manufacturer's name]."


- 98. Classified and Listed Compatibility List** - A circuit breaker that is both Classified and Listed is marked on the side with the statement:

"This circuit breaker is Listed for use in circuit breaker enclosures and panelboards intended and marked for its use. This circuit breaker is Classified for use, where the available short-circuit current is 10 kA, 120/240 V ac or less, in the compatible panelboards shown in Publication No. _____ provided with this circuit breaker. When used as a Classified circuit breaker, do not use in equipment connected to circuits having an available system short-circuit current in excess of 10 kA, 120/240 V ac. If additional information is necessary, contact [Classified circuit breaker manufacturer's name]."

- 99. Compatibility List** - The referenced publication is a compatibility list which tabulates the company name, catalog number, number of poles and electrical ratings of the Classified circuit breaker, in addition to the company name and catalog number of the applicable UL Listed

panelboards, and corresponding UL Listed circuit breakers in place of which the Classified circuit breaker has been investigated. The compatibility list also details the maximum permissible voltage and maximum available short circuit current of the supply system to the panelboard. The Classified circuit breaker is not suitable for the specified application if the system supply characteristics exceed the maximum values indicated in the compatibility list. One copy of the compatibility list is provided with each circuit breaker.

100. Classification and Listing Mark - Circuit breakers that are both Classified and Listed have markings as above, with the addition of the Listing Mark, located on the side of the circuit breaker.

The following mark:  appears on the front, visible surface of the circuit breaker.

101. General Markings- These circuit breakers are also marked as outlined for all breakers. See items 1-7, 14-21, 39-40, 42-43, 51-66 and 89-96.

MOLDED CASE CIRCUIT BREAKERS FOR USE IN PHOTVOLTAIC (PV) SYSTEMS

102. Voltage Rating - These circuit breakers are marked with a voltage rating up to 1000 V dc maximum

103. PV marking - These circuit breakers or circuit-breaker enclosures are marked "Photovoltaic" (or "PV") and may, in addition, be marked "Suitable for Use in Photovoltaic Systems in Accordance with Article 690 of the NEC," or equivalent.

104. Multi-pole PV Circuit Breakers - A multi-pole PV circuit breaker or PV circuit-breaker enclosure is intended for individual circuits on each pole unless specifically marked with a diagram and/or other verbiage detailing the correct electrical connections.

105. Temperature Rating - PV circuit breakers are marked "50°C."

106. Wire Range and Type - PV circuit breakers are marked with the applicable wire range, wire type, and stranding if different from building wire, temperature rating of the wire, and torque ratings for the pressure-wire terminations. For the wire type, the following abbreviations are used: copper (Cu), solid (sol), stranded (str). A breaker may, instead, be marked with the minimum size bus bar with which it can be used.

107. General - These devices are also marked as outlined for all breakers. See 1-7, 10-15, 17-23, 27, 28, 41, and 45.

LOCATION

General — All circuit breaker markings are assigned a location code indicating where a marking is to be applied on the breaker. The location codes are assigned a letter A through K, with A being the highest order and K the lowest. At the manufacturer's option, a higher order location code may be used for a marking.

Location Codes — The location codes are:

- A. The marking is visible without removing the trim or cover.
- B. The marking is visible without disassembling the device, when the trim or enclosure cover is removed, and may be visible with the trim or cover in place.
- C. The marking may be on any convenient location except the rear of the breaker.
- D. The marking need only be visible after removal of the CB frame cover, or the equivalent.
- E. The “TRIPPED” or “RESET” markings are not required on the breaker if the receiving device is so marked.
- F. For electrically operated breakers, the “ON” and “OFF” markings are not required on the breaker if the electrical operator is so marked.
- G. The “part replacement” marking does not need to be visible when the removable part is installed.
- H. The marking is visible when the wire connector is in place.
- I. The fuse or protector identification is to be visible when the cover over the fuse or protector compartment is removed.
- J. The marking or information may be shipped with the breaker.
- K. For breakers 1-1/2 inches wide per pole or less, the marking may be located at any convenient location except the rear of the breaker.

CIRCUIT BREAKER MARKINGS

The following gives the marking and associated location category.

GENERAL

Type Designation	B
Manufacturer's Name	B
Voltage Rating	B
Ampere Rating (more than 100 A)	B
Ampere Rating (100 A or less)	A
Line and Load Identification	B

POSITION INDICATION

On and Off (Open and Closed)	A
Trip and Reset	B, E
Electrical Operation (On and Off)	B, F
Electrical Operation (Trip and Reset)	B, F

INTERCHANGEABLE TRIP UNIT

Manufacturer's Name	D
Ampere Rating	B
Frame Designation	D
Magnetic Settings	D

INTERRUPTING RATINGS

Ratings	B, K
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TERMINATIONS

Terminations Cu-Al Wire	B
Small Wire Size	B
Tightening Torque	B, K
Maximum Wire Size	C, H
Multiple Conductor Connectors	C
60/75°C Wire	B, K
Separately Shipped Connectors	C
Cable Connection Only	B
Bus Bar Sizes	B

ADJUSTABLE TRIP

Instantaneous Trip	D
Adjustable Controls	B

SPECIAL MARKINGS

Non-Conducting Enclosures	C
Ventilated Enclosure	B
40°C	C
Current Limiting	C
Class CTL	C
"Delta"— Replacement Use Only	C
2-Pole — 3-Phase Rated	B
3-Pole — 1-Phase Rated	B

4-Pole — 3-Phase Rated	B
Multi-Wire Circuit	C
DC Rated 3-Pole	B
100 Percent Continuous Rated	B, C
“SWD”	B
Independent Trip	B
Special Characteristics	C, G
For Replacement Not CTL	B
Special Purpose Not General	B
HACR Type	B
“HID”	B

REMOTELY OPERATED CIRCUIT BREAKER

“Remotely Operated”	B
Equipment Label	J

FUSED CIRCUIT BREAKERS

Line and Load Identification	B
Identification of Fuses	I
No Open Fuse Tripping	B

CIRCUIT BREAKER/ GROUND FAULT CIRCUIT INTERRUPTER

“Test” Function	A
“Class A” Marking	C
Instructions	J
Terminal Identification	C, H

CIRCUIT BREAKER/ EQUIPMENT GROUND FAULT PROTECTION

“Test” Function	A
Trip Level Marking	B
Instructions	J
Terminal Identification	C, H

CIRCUIT BREAKER/ SURGE PROTECTION DEVICE

Type.....	B
Voltage Protection Rating	B
Nominal Discharge Current Rating.....	B
Maximum Continuous Operating Voltage Rating.....	B
Short Circuit Current Rating.....	B

CURRENT LIMITERS

Type Designation	B
Manufacturer’s Name	B
Terminations	B
Circuit Breaker	B
Interrupting Rating	B

ACCESSORIES

Ratings	C
Shunt Trip	C
Separately Shipped	C

External Dropping Resistor C

CIRCUIT BREAKERS ADAPTERS

Type Designation C
Manufacturer's Name C
Terminations C
Circuit Breaker C
Instructions J

CIRCUIT PROTECTORS

Manufacturer's Name B
Voltage Rating B
Ampere Rating B
Reset Instructions B

CIRCUIT BREAKERS FOR USE IN COMMUNICATIONS EQUIPMENT

Ambient Operating Temperature B
Wire Insulation Temperature Rating C
Same Polarity C

**MOLDED CASE CIRCUIT BREAKERS ALSO LISTED AS COMBINATION TYPE ARC FAULT
CIRCUIT INTERRUPTERS**

Device Identifier B
"TEST" Function A
Instructions J

**MOLDED CASE CIRCUIT BREAKERS ALSO LISTED AS BRANCH/FEEDER TYPE ARC
FAULT CIRCUIT INTERRUPTERS**

Device Identifier B
"TEST" Function A
Instructions J

CLASSIFIED MOLDED CASE CIRCUIT BREAKERS FOR USE IN SPECIFIED EQUIPMENT

Compatibility List J or K
Classified Identifier A

CIRCUIT BREAKER FOR USE IN PHOTVOLTAIC (PV) SYSTEMS

Voltage Rating B
PV Marking B
Wiring Diagram C
Temperature Rating C
Wire Range and Type B

APPENDIX A
UL MOLDED CASE CIRCUIT BREAKER PRODUCT CATEGORIES

UL does list these types of devices and continues to develop new product categories to address the safety issues associated with these types of devices. Below is a list of product categories that UL currently lists to address these types of products. Each product category is tabulated with a UL Category Code. By clicking on the code, you will be linked to the UL Guide Information for the category and any Listings or Classifications under that Product Category in the UL Online Certifications Directory database at www.ul.com/database. The table also identifies the sections of this Marking Guide that are applicable.

Category Code	Category Name	Marking Guide Sections
AVZQ	Molded case circuit breakers also Listed as Branch/Feeder type Arc Fault Circuit Interrupters	94-97
AWAH	Molded case circuit breakers also Listed as Combination type Arc Fault Circuit Interrupters	90-93
DHWZ	Circuit Breaker Adapters	77-81
DIHS	Accessories	73-76
DIMV	Circuit Breaker/Surge Protective Device	62-67
DIRW	Current Limiters (Accessory High-Fault Protectors)	68-72
DITT	Circuit Breaker for use in Communications Equipment	86-89
DIUR	Circuit Breakers for use in Photovoltaic Systems	102- 107
DIVQ	Molded Case Circuit Breaker	1-46
DIXF	Classified Molded Case Circuit Breakers for use in Specified Equipment	98-102
DIYA	Circuit Breakers/Ground Fault Protection	56-61
DIYV	Fused Circuit Breaker	47-50
DKUY	Circuit Breaker/Ground Fault Circuit Interrupter	47-51
DLBX	Circuit Protectors	82-85