

Superseded by 1980

Australian Standard 2184—1978

MOULDED-CASE CIRCUIT-BREAKERS

(up to and including
600 V a.c. and 250 V d.c.)

(interrupting rating 10 kA
and more)



STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter



THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL ORGANIZATIONS and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Electrical Manufacturers Association
Australian-British Trade Association
Confederation of Australian Industry
Department of Defence
Department of Productivity
Electrical Contractors Associations of Australia
Electricity Supply Association of Australia
Institution of Engineers Australia
Railways of Australia Committee
Testing Authorities

This standard, prepared by Committee EL/6, Industrial Switchgear and Controlgear, was approved on behalf of the Council of the Standards Association of Australia on 4 May 1978, and was published on 1 July 1978.

To keep abreast of progress in industry, Australian standards are regularly reviewed. Suggestions for improvement to published standards, addressed to the head office of the Association, are welcomed.

AUSTRALIAN STANDARD SPECIFICATION

MOULDED-CASE CIRCUIT-BREAKERS

**(up to and including 600 V a.c. and
250 V d.c.)**

(interrupting rating 10 kA and more)

AS 2184-1978

First published (as AS C411) 1970
Revised and issued as AS 2184 1978

**PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.**

ISBN 0 7262 1505 8

PREFACE

This standard was prepared by the Association's Committee on Industrial Switchgear and Controlgear as the revision and metrication of AS C411 — 1970, which it accordingly supersedes.

Apart from changes to the sizes and ratings of cables and busbars specified for tests, and the addition of new Clauses 8.2.3.3, Application of the Test Voltage, and 8.2.9.9, Behaviour of the Circuit-breaker During the Interrupting Test, this standard is technically identical with AS C411.

Consideration was given to the combining of this standard and AS 1930, Circuit-breakers for Distribution Circuits (based on IEC 157-1 Low Voltage Switchgear and Controlgear, Part 1 Circuit-breakers) into one standard as has been done by IEC. The committee decided to retain the two Australian standards as separate entities for the present as the articles covered by this standard and by AS 1930 are quite different and as a consequence most of the requirements are different.

The committee appreciated, however, that as moulded-case circuit-breakers are being increasingly used at higher continuous current ratings, and the distinction between moulded-case circuit-breakers and other circuit-breakers for distribution circuits is less defined at these higher ratings, the above decision could be modified by the time AS 1930 and this standard are next revised.

In the application of this standard reference may be necessary to the following Australian standards:

- AS 3000 Part 1 — SAA Wiring Rules
- AS 3111 Approval and Test Specification for Miniature Overcurrent Circuit-breakers
- AS C100 Approval and Test Specification for Definitions and General Requirements for Electrical Materials and Equipment

© Copyright — STANDARDS ASSOCIATION OF AUSTRALIA 1978

Users of standards are reminded that copyright subsists in all SAA publications. No part of this publication may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing of the Standards Association of Australia.

CONTENTS

	<i>Page</i>
SECTION 1. GENERAL	
1.1 Scope	5
1.2 Object	5
1.3 Exemptions	5
SECTION 2. DEFINITIONS	
2.1 Application	6
2.2 Moulded-case Circuit-breaker	6
2.3 Components	6
2.4 Operation	7
2.5 Operating Times	7
2.6 Electrical Values	8
SECTION 3. CLASSIFICATION	
3.1 Designation of Circuit-breaker	9
3.2 Classes	9
SECTION 4. CHARACTERISTICS	
4.1 Summary of Characteristics	10
4.2 Type of Moulded-case Circuit-breaker	10
4.3 Rated Voltage	10
4.4 Frame Sizes	10
4.5 Rated Continuous Current	10
4.6 Rated Frequency	11
4.7 Interrupting Rating	11
4.8 Circuit-breakers with Other Ratings	11
SECTION 5. MARKING	
5.1 Marking	12
5.2 Location	13
SECTION 6. STANDARD CONDITIONS OF OPERATION IN SERVICE	
6.1 Service Conditions	14
6.2 Conditions of Installation	14
6.3 Shape and Symmetry of Voltages	14

	<i>Page</i>
SECTION 7. DESIGN AND CONSTRUCTION	
7.1 Mechanical Design	15
7.2 Temperature Rise	15
7.3 Dielectric Properties	16
7.4 Operating Conditions	16
7.5 Adjustable Trip Elements	17
7.6 Instantaneous Trip Calibration	18
7.7 Mechanical Endurance	18
7.8 Accessories	18
SECTION 8. TESTS	
8.1 Tests—General	19
8.2 Type Tests	19
8.3 Routine Production Tests	29
APPENDICES	
A Test Quantities	33
B Special Information to be given by the Purchaser	37
C Accessories	38
D Clearances and Creepage Distances for Moulded-case Circuit-breakers	39
TABLES	
7.2.1 Temperature-rise Limits for Insulated Coils	16
7.4.2 Maximum Tripping Time	17
8.2.1 Type and Sequence of Tests	20
8.2.2 (A) Cable Ratings	22
8.2.2 (B) Busbar Ratings	23
8.2.5 Cycles for Endurance Test	24
8.2.9.5 Power Factor of Test Circuit	27
8.2.9.6 Time-constant of Test Current	28

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard Specification for MOULDED-CASE CIRCUIT BREAKERS (up to and including 600 V a.c. and 250 V d.c.) (interrupting rating 10 kA and more)

SECTION 1. GENERAL

1.1 SCOPE. This standard applies to single-pole and multipole moulded-case air-break circuit-breakers, including circuit-breakers incorporating replaceable current limiting fuses, having voltage ratings up to and including 600 V a.c. and 250 V d.c. and interrupting ratings of 10 000 A (10 kA) or more.

It does not apply to single-pole and multipole circuit-breakers intended for installation in rail or road vehicles or in aircraft.

NOTE: Although this standard is intended to apply only to circuit-breakers having an interrupting rating of 10 kA or more, the interrupting rating tests (see Clause 8.2.9) are used to verify claimed breaking capacities between 3 and 10 kA of circuit-breakers falling within the scope of AS 3111, Approval and Test Specification for Miniature Overcurrent Circuit-breakers.

1.2 OBJECT. The object of this standard is to state:

- (i) the characteristics of circuit-breakers;
- (ii) the conditions with which circuit-breakers must comply with reference to —
 - (a) their operation and behaviour in normal service;
 - (b) their operation and behaviour under fault conditions;
 - (c) their dielectric properties;
- (iii) the tests intended for confirming that these conditions have been met and the methods to be adopted for these tests;
- (iv) the data to be marked on the apparatus.

1.3 EXEMPTIONS. Any circuit-breaker which falls within the scope of this standard and which has been type-tested and approved to any one of the overseas standards given below shall, without further testing, on production of satisfactory test reports or proof of listing by the Underwriters' Laboratories Inc., U.S.A., be deemed to comply with the test requirements of this standard for the same interrupting rating if a standard value from Clause 4.7, or for the next lower standard rating:

NEMA Standards Publication AB1 — 1975.

Underwriters' Laboratories Inc. Standard No 489.