

Molded Case Circuit Breaker Product Family



Product Overview

Eaton's molded case circuit breakers are designed to provide circuit protection for low voltage distribution systems. They are described by NEMA as, "... a device for closing and interrupting a circuit between separable contacts under both normal and abnormal conditions," and furthermore as, "... a breaker assembled as an integral unit in a supporting and enclosing housing of insulating material." The National Electrical Code (NEC) describes them as, "A device designed to open and close a circuit by non-automatic means, and to open the circuit automatically on a predetermined overload of current, without injury to itself when properly applied within its rating."

So designed, Eaton circuit breakers protect conductors against overloads and conductors and connected apparatus, such as motors and motor starters, against short circuits.

In low voltage distribution systems, there are many varied applications of molded case circuit breakers.

Eaton offers the most comprehensive family of molded case circuit breakers in the industry.

This section of circuit breakers includes:

- Thermal-magnetic trip breakers
- Electronic rms trip breakers
- Molded case switches
- Motor circuit protectors
- Current limiting breakers
- Special application breakers

Modified Breakers

Eaton breakers can be ordered with internal accessories installed. These modified breakers will be subject to an addition charge.

Special Calibration

Special non-UL-listed calibrations are available for certain ambient temperatures other than 40 °C and for frequencies other than 50/60 Hz or DC. Reduced interrupting ratings will apply for 400 Hz applications.

Contents

Description

Page

Standards and Certifications	V4-T2-255
Quick Reference	V4-T2-256
G-Frame (15–100 Amperes)	V4-T2-259
F-Frame (10–225 Amperes)	V4-T2-273
J-Frame (70–250 Amperes)	V4-T2-291
K-Frame (70–400 Amperes)	V4-T2-299
L-Frame (125–600 Amperes)	V4-T2-323
M-Frame (300–800 Amperes)	V4-T2-349
N-Frame (400–1200 Amperes)	V4-T2-360
R-Frame (800–2500 Amperes)	V4-T2-375
Motor Circuit Protectors (MCP)	V4-T2-394
Motor Protection Circuit Breakers (MPCB)	V4-T2-405
Type ELC Current Limiter Attachment (Size 0–4)	V4-T2-407
Current Limiting Circuit Breaker Module	V4-T2-408
Internal Accessories	V4-T2-411
External Accessories	V4-T2-444

Learn
OnlineDrawings
Online

50 °C Calibration

Add suffix **V** to catalog Number for complete breaker, listed above, when ordering listed ampere ratings for breakers to be used in 50 °C ambients. (No UL label.)

Moisture-Fungus Treatment

All circuit breaker cases are molded from glass-polyester which does not support the growth of fungus. Any parts which are susceptible to the growth of fungus will require special treatment.

Freeze-Tested Circuit Breakers

The circuit breakers may be ordered with freeze testing. This option uses special lubrication and mechanical operation is verified at –40 °C.

Marine Applications

E- to R-Framed circuit breakers can be supplied to meet the following marine specifications:

- U.S. Coast Guard CFR 46; ABS—American Bureau of Shipping; IEEE 45; DNV; Lloyds; and ABS/NVR

These specifications generally require molded case circuit breakers to be supplied with 50 °C ambient, and plug-in adapter kits. When plug-in adapter kits are used, no terminals need be supplied (switchboard applications).

Circuit breakers can also be supplied to meet UL 489 Supplement SA (Marine use) and UL 489 Supplement SB (Naval Use).

UL 489 Supplement SA applies to vessels over 65 feet (19.8 m) in length. Requirements include 40 °C ambient calibration, special labeling, and no use of aluminum conductors or terminals. (No 50 °C.)

- Suffix H08

Or you can choose to add 50 °C ambient but then there is no "UL" mark.

- Suffix VH08

UL 489 Supplement SB requires partial 50 °C ambient calibration, vibration testing, special nameplating and no use of aluminum conductors or terminals. Eaton chooses to always fully calibrate to 50 °C ambient. ("Naval" labeled per UL, and UL now allows 50 °C label here.)

- Suffix VH09

Certified Test Reports

Eaton breakers can be ordered with certified test reports at the time of order entry. Test report documents the thermal and magnetic or electronic tripping characteristics of the individual breaker. Breaker and test report must be ordered together. Add suffix 12 to breaker catalog number and enter separate line item on order for certified test report.

Standards and Certifications

Molded case circuit breakers are designed to conform with the following standards:

- Underwriters Laboratories Inc., Standard UL 489, molded case circuit breakers and circuit breaker enclosures
- National Electrical Manufacturers Association (NEMA) Standards Publication No. AB1-1993, molded case circuit breakers
- Australian Standard AS 2184, molded case circuit breakers
- British Standards Institution Standard BS 4752: Part 1, switchgear and control gear Part 1: circuit breakers
- Canadian Standards Association (CSA) Standard C22.2 No. 5, service entrance and branch circuit breakers
- International Electrotechnical Commission Recommendations IEC 60947-2, circuit breakers
- Japanese T-Mark Standard molded case circuit breakers
- South African Bureau of Standards, Standard SABS 156, Standard Specification for molded case circuit breakers
- Swiss Electro-Technical Association Standard SEV 157-1, safety regulations for circuit breakers
- Union Technique de l'Electricite Standard NF C 63-120, low voltage switchgear and control gear circuit breaker requirements
- Verband Deutscher Elektrotechniker (Association of German Electrical Engineers) Standard VDE 0660, low voltage switchgear and control gear, circuit breakers

Conformance with these standards satisfies most local and international codes, assuming user acceptability and simplified application.

Molded case circuit breakers equal or exceed Federal Specification Classification W-C-375b requirements for the particular class associated with the circuit breaker frame being considered.

Open breakers do not have service entrance ratings. Service entrance rating is part of the enclosure.



Molded Case Circuit Breaker Product Family



Contents

Description	Page
Product Overview	V4-T2-254
Standards and Certifications	V4-T2-255
Quick Reference	V4-T2-256
G-Frame (15–100 Amperes)	
Catalog Number Selection.	V4-T2-260
Technical Data and Specifications	V4-T2-260
F-Frame (10–225 Amperes)	V4-T2-273
J-Frame (70–250 Amperes)	V4-T2-291
K-Frame (70–400 Amperes)	V4-T2-299
L-Frame (125–600 Amperes)	V4-T2-323
M-Frame (300–800 Amperes)	V4-T2-349
N-Frame (400–1200 Amperes)	V4-T2-360
R-Frame (800–2500 Amperes)	V4-T2-375
Motor Circuit Protectors (MCP)	V4-T2-394
Motor Protection Circuit Breakers (MPCB)	V4-T2-405
Type ELC Current Limiter Attachment (Size 0–4)	V4-T2-407
Current Limiting Circuit Breaker Module	V4-T2-408
Internal Accessories	V4-T2-411
External Accessories.	V4-T2-444

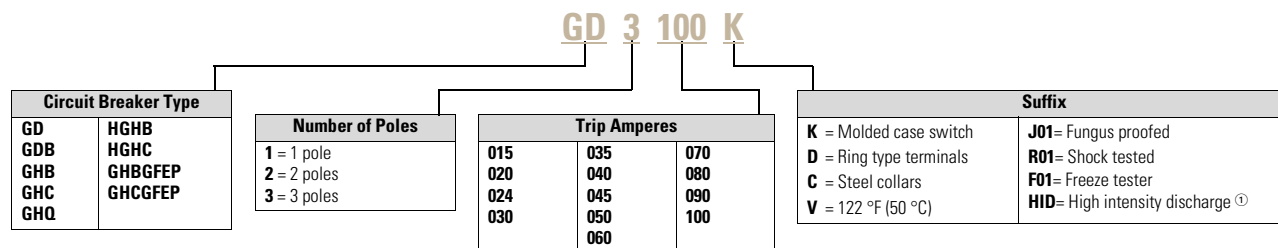
G-Frame (15–100 Amperes)

Product Description

- All two- and three-pole circuit breakers are of the common trip type. On all three-phase delta (240 V) Grounded B phase applications, refer to Eaton
- Single-pole circuit breakers, 15 and 20 amperes. Switching duty rated (SWD) for fluorescent lighting applications
- All G-Frame circuit breakers are suitable for reverse feed use
- HACR rated

Catalog Number Selection

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

Circuit Breaker/Frame**Technical Data and Specifications****UL 489 Interrupting Capacity Ratings**

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)						Volts DC	
		Volts AC (50/60 Hz)					480Y/277	125 ②	250 ③④
		120	240	277	480				
GDB	2, 3	—	—	—	14	—	—	—	10
GD	2	—	65	—	14	—	—	—	10
GD	3	—	65	—	22	—	—	—	10
GHQ	—	65	—	14	—	—	—	—	—
GHB	1	65	—	14	—	—	14	14	—
GHB	2, 3	—	65	—	—	14	14	14	—
HGHB	1	65	—	25	—	—	14	14	—
GHC	1	65	—	14	—	—	14	14	—
GHC	2, 3	—	65	—	—	14	14	14	—
HGHC	1	65	—	25	—	—	14	14	—

Terminal Types

For line and load-side. Terminals are UL listed as suitable for wire type and size given below.

Terminal Types

Circuit Breaker Amperes	Terminal Type Material	Screw Head Type	Wire Type	AWG Wire Range	Metric Wire Range (mm ²) ⑤
Standard					
15–20	Clamp (plated steel)	Slotted	Cu/Al	14–10	2.5–4
25–100	Pressure (aluminum body)	Slotted	Cu/Al	10–1/0	4–50
Optional—GD, GHB, GHC					
15–100	Pressure (steel body)	Slotted	Cu	14–3	—

Notes

- ① HID suffix only applies to the GHB and GHC single-pole, 15–20 A circuit breakers.
 ② Single-pole breakers can be applied in DC systems up to 70 A.
 ③ Time constant is 8 milliseconds minimum.
 ④ Two poles of three-pole circuit breaker.
 ⑤ Not UL listed sizes.