

Series G, 15–2500 Amperes for UL, CSA and IEC Applications

2



Contents

| <i>Description</i> | <i>Page</i> |
|---|------------------|
| Series G | |
| Standards and Certifications | V4-T2-143 |
| Product Selection Overview | V4-T2-144 |
| Product Selection Guide | V4-T2-145 |
| Technical Data and Specifications | V4-T2-147 |
| Dimensions and Weights | V4-T2-152 |
| EG-Frame (15–125 Amperes) | V4-T2-153 |
| JG-Frame (63–250 Amperes) | V4-T2-167 |
| LG-Frame (250–630 Amperes) | V4-T2-185 |
| NG-Frame (320–1200 Amperes) | V4-T2-203 |
| RG-Frame (800–2500 Amperes) | V4-T2-212 |
| Motor Circuit Protectors (MCP) | V4-T2-223 |
| Motor Protector Circuit Breakers (MPCB) | V4-T2-227 |
| 30 mA Ground Fault (Earth Leakage) Module | V4-T2-230 |
| Current Limiting Circuit Breaker Module | V4-T2-234 |
| High Instantaneous Circuit Breaker for | |
| Selective Coordination | V4-T2-239 |
| Special Features and Accessories | V4-T2-242 |
| Motor Operators | V4-T2-250 |
| Plug-In Blocks | V4-T2-252 |
| Drawout Cassette | V4-T2-253 |



Product Overview

Series G, 15–2500 Amperes for UL, CSA and IEC Applications

Eaton Series G molded case circuit breakers provide increased performance in considerably less space than standard circuit breakers or comparable fusible devices.

The “G” signifies global applications: Series G circuit breakers are marked with UL, CSA, CE, IEC and KEMA KEUR listings. Other advantages include:

- Field-fit accessories
- Common accessories through 630 amperes
- Electronic trip units from 20 to 2500 amperes
- UL-listed and IEC-rated, 30 mA ground fault/earth leakage modules
- Built-in ground fault protection down to 20 amperes

The EG, JG and LG frames are designed around space-saving footprints. The NG and RG use the proven Eaton Series C ND and RD designs.

The Series G family includes five frame sizes in ratings from 15 to 2500 amperes. Series G offers a choice of several interrupting capacities up to 200 kA at 480 volts AC (200 kA at 240 volts AC).

Series G molded case circuit breakers are also available in direct current options. Please see Specialty Breakers **Section 2.6** for more details.

Standard calibration is 40 °C. For applications in high ambient temperature conditions, 50 °C factory calibration is available on thermal-magnetic breakers (not UL).

The Most Logically Designed Contact Assembly

The flexibility and outstanding performance characteristics of Eaton circuit breakers are made possible by the best contact designs in circuit breaker history. Our technology creates a high-speed “blow-open” action using the electromechanical forces produced by high-level fault currents.

Eaton circuit breakers are operated by a toggle-type mechanism that is mechanically trip-free from the handle so that the contacts cannot be held closed against short circuit currents. Tripping due to overload or short circuits is clearly indicated by the position on the handle. This remarkably fast and dependable contact action is designed to enhance safety.

Thorough In-Plant Testing

The quality, dependability and reliability of every Eaton Circuit Breaker is ensured by a thorough program of in-plant testing. Two calibration tests are conducted on every pole of every circuit breaker to verify the trip mechanism, operating mechanism, continuity and accuracy.

Current Limiting Characteristics

Circuit breakers are current limiting because of their high repulsion contact arrangement and use of state-of-the-art arc extinguishing technology.

Eaton offers one of the most complete lines of current limiting breakers in the industry. The industrial breakers are available in current limiting versions with interrupting capacities up to 200 kA at 480 V without fuses in the same physical size as standard and high interrupting capacity breakers.

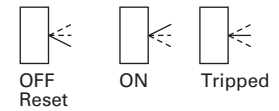
Operating Mechanisms

Eaton circuit breakers have a toggle handle operating mechanism, which also serves as a switching position indicator. The indicator shows the positions of: ON, OFF and TRIPPED.

The toggle handle snaps into the TRIPPED position if the breaker is tripped by one of its overcurrent, short circuit, shunt or undervoltage releases. Before the circuit breaker can be reclosed following a trip-out, the toggle handle must be brought beyond the OFF position (RESET). The circuit breaker can then be reclosed.

As an additional switching position indicator for EG- to RG-Frame circuit breakers, there are two windows on the right and on the left of the toggle handle, in which the switching state is indicated by means of the colors red, green and white corresponding to the ON, OFF and TRIPPED positions respectively.

Positions of the Toggle Handle Drive



Standards and Certifications

Eaton Series G circuit breakers meet applicable UL 489 and IEC 60947-2 standards.

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

- Australian Standard AS 2184 and AS 3947-2 molded case circuit breakers
- British Standards Institution Standard EN60947.2
- International Electromechanical Commission Recommendations IEC 60947.2 circuit breakers
- CE
- Japanese T-Mark standard molded case circuit breakers
- National Electrical Manufacturers Association Standards Publication No. AB1-1993 molded case circuit breakers
- South African Bureau of Standards, Standard SANS 156, Standard Specification for molded case circuit breakers
- Swiss Electro-Technical Association Standard SEV 947.2, 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 Elektrotechnike (Association of German Electrical Engineers) Standard VDE 0660, low voltage switchgear and control gear, circuit breakers

Global Third-Party Certification

Certification marks ensure product compliance with the total standard via the third party witnessing of tests by globally recognized independent certification organizations.

KEMA is a highly recognized, independent international organization that offers certification and inspection facilities for equipment in many industries. The KEMA-KEUR mark is the highest certification an electrical product can receive from KEMA. Our IEC 60947-2 molded case circuit breakers are KEMA tested and certified. These breakers are also listed in accordance with UL 489, as well as CSA C22.2 No. 5-02.

KEMA, UL and CSA provide ongoing follow-up testing and inspections to ensure that Eaton molded case circuit breakers continue to meet their exacting standards.

ISO Certification

Eaton circuit breakers are manufactured in ISO® certified facilities.

Product Selection Overview

Electronic Trip Units (Digitrip RMS Trip Units)—Multi-Function Electronic Trip Units for All Applications

2

True rms Sensing

Digitrip RMS trip units use Eaton's microprocessor-based intelligence to provide true rms sensing, permitting increased accuracy and reliable system protection. True rms sensing is not susceptible to nuisance tripping when waveforms containing high harmonic currents are present.

Digitrip RMS 310+

Digitrip RMS 310+ electronic trip units are available with Eaton Series G circuit breakers JG, LG, NG and RG, as well as Series C FD, KD, LD and MDL circuit breakers.

Digitrip 310+ trip units are equipped with an integrated I_r switch that allows users to modify the continuous current rating of the breaker without having to replace a rating plug. This provides further flexibility for coordination in systems. The trip units may be used in 50 Hz or 60 Hz applications. The Digitrip 310+ offers true rms sensing, is front adjustable and has an optional local display of current and cause of trip.

Curve Shaping

When selectively coordinated systems are called for, Digitrip RMS 310+ will provide a cost-effective solution for a variety of applications.

The standard Digitrip RMS 310+ includes an adjustable short time pickup setting encompassing an I^2t ramp function that provides the basic LS curve shaping function.

Digitrip 310+ trip units also include selectable long time delay (t_{LD}) and pickup settings (I_r). A rating plug is not required.

The optional Digitrip RMS 310+ LSI and LSI \bar{G} provide additional flat response short time delay adjustments and an instantaneous setting to provide LSI curve shaping capability.

Digitrip RMS 310+ LSG and LSI \bar{G} units are available with ground fault pickup and flat response ground fault delay. Ground fault alarm options are available with trip and no trip functionality as a means to notify users of a ground fault condition with the option to maintain the breaker online.

Digitrip RMS 310+ trip units can effectively coordinate with both sophisticated upstream power breakers as well as downstream thermal-magnetic breakers, making Digitrip RMS 310+ trip units the cost-effective reliable choice for selectively coordinated systems.

Thermal Memory

All Digitrip RMS trip units incorporate a long delay. Thermal memory prevents the system from cumulative overheating due to repeated overcurrent events that may occur in quick succession.

Field Testing

A field test kit is available for Digitrip RMS 310+ trip units.

Arcflash Reduction Maintenance Mode (ARMS)

ARMS is an available feature on KD, LG, LD, MDL, NG and RG frames with 310+ electronic trip units. This feature increases worker safety by providing an accelerated instantaneous trip unit to reduce arc flash. Additionally, LG, NG and RG frames with the ARMS feature include a fully adjustable instantaneous setting.

Digitrip RMS 610 and 910

Digitrip RMS 610 and 910 trip units are available with Eaton R-Frame circuit breakers 800 through 2500 amperes. Digitrip 610 and 910 trip units provide unparalleled system protection with the added convenience of a local display.

Curve Shaping

Digitrip RMS 610 and 910 trip units are available with up to nine curve shaping choices achieved by adjusting up to seven switches on the front of the unit for optimum system coordination. Maximum curve shaping flexibility is provided by dependent long and short delay adjustments that are long delay pickup (I_r) based, depicted on the front of the unit by the blue portion of the time-current curve.

Additional coordination capability can be provided by utilizing the short delay and ground fault zone selective interlocking features available on these trip units.

System Diagnostics

Digitrip RMS 610 and 910 models of trip units provide long delay, short delay, instantaneous, and ground fault cause of trip LEDs on the front of the unit. Their display shows a magnitude of trip information, as well as remote signal contacts, for improved system alarming.

System Monitoring

Digitrip 610 and 910 trip units have the capability to monitor phase currents, as well as neutral or ground currents. This information is displayed on a large digital display mounted on the unit.

Digitrip RMS 910 trip units can also provide the user with power and energy monitoring capability. Peak power demand, present power demand, and total energy, as well as forward and reverse energy can be monitored with this unit.

Digitrip RMS 910 trip units have the additional capability of monitoring line-to-line voltage, as well as system power factor. Both parameters are displayed in the digital display window and are supported by LEDs to indicate which parameter is being displayed.

Harmonics Monitoring

Digitrip RMS 910 trip units are capable of displaying values of current harmonics in the digital display window. Percentage of harmonic content can be monitored for each phase, up to the 27th harmonic. Additionally, a total harmonic distortion value can be calculated and displayed.

Communications

Digitrip RMS 910 units have built-in communications options to allow all protection, monitoring, and control information to be transmitted back to a central location via the Eaton PowerNet™ system.

Field Testing

Integral field testing capability is provided on all 610 and 910 trip units. No additional test set is needed to perform both trip and no trip field testing.

EG-Frame (15–125 Amperes)**EG-Frame (15–125 Amperes)****Product Description**

EG breaker is HACR rated.

Contents**Description****Page**

| | |
|--|------------------|
| EG-Frame (15–125 Amperes) | |
| Catalog Number Selection | V4-T2-154 |
| Product Selection | V4-T2-155 |
| Accessories | V4-T2-164 |
| Technical Data and Specifications | V4-T2-165 |
| Dimensions and Weights | V4-T2-165 |
| JG-Frame (63–250 Amperes) | V4-T2-167 |
| LG-Frame (250–630 Amperes) | V4-T2-185 |
| NG-Frame (320–1200 Amperes) | V4-T2-203 |
| RG-Frame (800–2500 Amperes) | V4-T2-212 |
| Motor Circuit Protectors (MCP) | V4-T2-223 |
| Motor Protector Circuit Breakers (MPCB) | V4-T2-227 |
| 30 mA Ground Fault (Earth Leakage) Module | V4-T2-230 |
| Current Limiting Circuit Breaker Module | V4-T2-234 |
| High Instantaneous Circuit Breaker for Selective Coordination | V4-T2-239 |
| Special Features and Accessories | V4-T2-242 |
| Motor Operators | V4-T2-250 |
| Plug-In Blocks | V4-T2-252 |
| Drawout Cassette | V4-T2-253 |

2.3

Molded Case Circuit Breakers

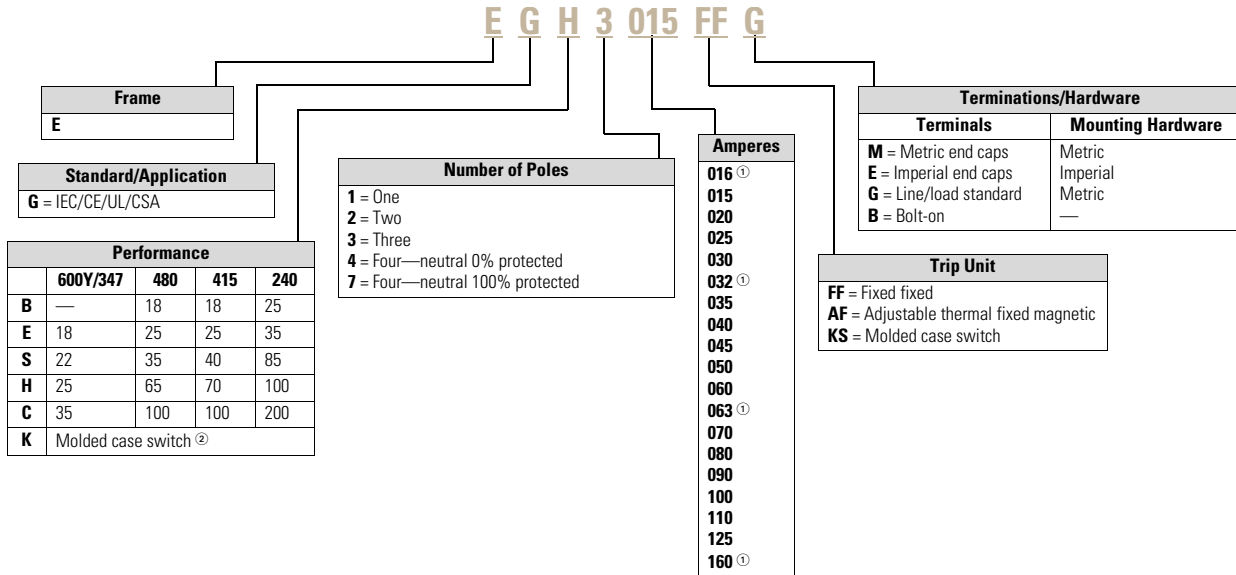
Series G

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.

2

Series G—EG-Frame (15–125 Amperes)



Notes

- ^① Cannot be UL rated.
- ^② Available only as 125 and 160 A sizes.

Product Selection

Complete Breaker (Includes Frame, Trip Unit, Standard Terminals and Mounting Hardware) IC Rating at 415/480 Volts

EG-Frame



EG-Frame—18/18

| Maximum Continuous Amps at 40 °C ① | Single-Pole | Two-Pole | Three-Pole | Adjustable ② Thermal, Fixed Magnetic | Four-Pole ③ | Adjustable ② Thermal, Fixed Magnetic |
|------------------------------------|--|--|--|--|--|--|
| | Fixed Thermal, Fixed Magnetic Catalog Number | Fixed Thermal, Fixed Magnetic Catalog Number | Fixed Thermal, Fixed Magnetic Catalog Number | Fixed Thermal, Fixed Magnetic Catalog Number | Fixed Thermal, Fixed Magnetic Catalog Number | Fixed Thermal, Fixed Magnetic Catalog Number |
| 15 | EGB1015FFG | EGB2015FFG | EGB3015FFG | — | EGB4015FFG | — |
| 16 | EGB1016FFG | EGB2016FFG | EGB3016FFG | — | EGB4016FFG | — |
| 20 | EGB1020FFG | EGB2020FFG | EGB3020FFG | — | EGB4020FFG | EGB4020AFG |
| 25 | EGB1025FFG | EGB2025FFG | EGB3025FFG | EGB3025AFG | EGB4025FFG | EGB4025AFG |
| 30 | EGB1030FFG | EGB2030FFG | EGB3030FFG | — | EGB4030FFG | — |
| 32 | EGB1032FFG | EGB2032FFG | EGB3032FFG | EGB3032AFG | EGB4032FFG | EGB4032AFG |
| 35 | EGB1035FFG | EGB2035FFG | EGB3035FFG | — | EGB4035FFG | — |
| 40 | EGB1040FFG | EGB2040FFG | EGB3040FFG | EGB3040AFG | EGB4040FFG | EGB4040AFG |
| 45 | EGB1045FFG | EGB2045FFG | EGB3045FFG | — | EGB4045FFG | — |
| 50 | EGB1050FFG | EGB2050FFG | EGB3050FFG | EGB3050AFG | EGB4050FFG | EGB4050AFG |
| 60 | EGB1060FFG | EGB2060FFG | EGB3060FFG | — | EGB4060FFG | — |
| 63 | EGB1063FFG | EGB2063FFG | EGB3063FFG | EGB3063AFG | EGB4063FFG | EGB4063AFG |
| 70 | EGB1070FFG | EGB2070FFG | EGB3070FFG | — | EGB4070FFG | — |
| 80 | EGB1080FFG | EGB2080FFG | EGB3080FFG | EGB3080AFG | EGB4080FFG | EGB4080AFG |
| 90 | EGB1090FFG | EGB2090FFG | EGB3090FFG | — | EGB4090FFG | — |
| 100 | EGB1100FFG | EGB2100FFG | EGB3100FFG | EGB3100AFG | EGB4100FFG | EGB4100AFG |
| 110 | EGB1110FFG | EGB2110FFG | EGB3110FFG | — | EGB4110FFG | — |
| 125 | EGB1125FFG | EGB2125FFG | EGB3125FFG | EGB3125AFG | EGB4125FFG | EGB4125AFG |
| 160 | — | — | EGB3160FFG | EGB3160AFG | EGB4160FFG | EGB4160AFG |

Notes

① 16, 32, 63 and 160 A are not UL listed ratings.

② Adjustable thermal are not UL listed.

③ Change the fourth digit to 7 for 100% neutral protection. Neutral is on the LH side.