

# Specifications

## Eaton 167123

Eaton Moeller series xEffect - FRCmM-NA RCCB. Residual current circuit breaker (RCCB), 40A, 2p, 300mA, type G/A, UL

### General specifications

|                             |                                                                                                                |
|-----------------------------|----------------------------------------------------------------------------------------------------------------|
| <b>PRODUCT NAME</b>         | Eaton Moeller series<br>xEffect - FRCmM-NA RCCB                                                                |
| <b>CATALOG NUMBER</b>       | 167123                                                                                                         |
| <b>MODEL CODE</b>           | FRCMM-40/2/03-G/A-NA                                                                                           |
| <b>EAN</b>                  | 4015081636242                                                                                                  |
| <b>PRODUCT LENGTH/DEPTH</b> | 76 mm                                                                                                          |
| <b>PRODUCT HEIGHT</b>       | 80 mm                                                                                                          |
| <b>PRODUCT WIDTH</b>        | 35 mm                                                                                                          |
| <b>PRODUCT WEIGHT</b>       | 0.22 kg                                                                                                        |
| <b>COMPLIANCES</b>          | RoHS conform                                                                                                   |
| <b>CERTIFICATIONS</b>       | UL 1053<br>IEC 61008<br>EN 61008<br>ÖVE E 8601<br>EN45545-2<br>IEC 61373                                       |
| <b>CATALOG NOTES</b>        | Additionally protects<br>against special forms of<br>residual pulsating DC<br>which have not been<br>smoothed. |
| <b>GLOBAL CATALOG</b>       | 167123                                                                                                         |
| <b>PRODUCT TYPE</b>         | RCCB                                                                                                           |

## Product specifications

|                                                                                         |                                                                                                                                  |
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| <b>USED WITH</b>                                                                        | FRCmM-NA<br>Residual current circuit breakers<br>Type G/A (☛VE E 8601)                                                           |
| <b>AMPERAGE RATING</b>                                                                  | 40 A                                                                                                                             |
| <b>FEATURES</b>                                                                         | Residual current circuit breaker<br>Additional equipment possible                                                                |
| <b>10.10 TEMPERATURE RISE</b>                                                           | The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices. |
| <b>10.11 SHORT-CIRCUIT RATING</b>                                                       | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| <b>10.12 ELECTROMAGNETIC COMPATIBILITY</b>                                              | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| <b>10.13 MECHANICAL FUNCTION</b>                                                        | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.                         |
| <b>10.2.2 CORROSION RESISTANCE</b>                                                      | Meets the product standard's requirements.                                                                                       |
| <b>10.2.3.1 VERIFICATION OF THERMAL STABILITY OF ENCLOSURES</b>                         | Meets the product standard's requirements.                                                                                       |
| <b>10.2.3.2 VERIFICATION OF RESISTANCE OF INSULATING MATERIALS TO NORMAL HEAT</b>       | Meets the product standard's requirements.                                                                                       |
| <b>10.2.3.3 RESIST. OF INSUL. MAT. TO ABNORMAL HEAT/FIRE BY INTERNAL ELECT. EFFECTS</b> | Meets the product standard's requirements.                                                                                       |
| <b>10.2.4 RESISTANCE TO ULTRA-VIOLET (UV) RADIATION</b>                                 | Meets the product standard's requirements.                                                                                       |
| <b>10.2.5 LIFTING</b>                                                                   | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| <b>10.2.6 MECHANICAL IMPACT</b>                                                         | Does not apply, since the entire switchgear needs to                                                                             |

## Resources

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| APPLICATION NOTES             | <a href="#">eaton-rcd-application-guide-br019003en-en-us.pdf</a>                                                                                                                                                                                                                           |
| CATALOGS                      | <a href="#">eaton-xeffect-industrial-switchgear-range-catalog-ca003002en-en-us.pdf</a><br><br><a href="#">Circuit Protection, Miniature Circuit Breakers and Supplementary Protectors, Volume 4, Tab 1</a><br><br><a href="#">eaton-xeffect-frcmm-na-rccb-catalog-ca003019en-en-us.pdf</a> |
| DECLARATIONS OF CONFORMITY    | <a href="#">eaton-rccb-declaration-of-conformity-eu250057en.pdf</a><br><br><a href="#">eaton-rccb-declaration-of-conformity-uk251420en.pdf</a>                                                                                                                                             |
| DRAWINGS                      | <a href="#">eaton-circuit-breaker-xeffect-frcmm-na-rccb-dimensions.eps</a>                                                                                                                                                                                                                 |
| ECAD MODEL                    | <a href="#">ETN.FRCMM-40_2_03-G_A-NA</a>                                                                                                                                                                                                                                                   |
| INSTALLATION INSTRUCTIONS     | <a href="#">MA180503312</a>                                                                                                                                                                                                                                                                |
| MCAD MODEL                    | <a href="#">eaton-residual-current-circuit-breakers-drawings-f9-ul1053-2p.dwg</a><br><br><a href="#">eaton-residual-current-circuit-breakers-3d-models-f9-ul1053-2p.stp</a>                                                                                                                |
| SPECIFICATIONS AND DATASHEETS | <a href="#">Eaton Specification Sheet - 167123</a>                                                                                                                                                                                                                                         |
| WIRING DIAGRAMS               | <a href="#">eaton-circuit-breaker-xeffect-frcmm-na-rccb-wiring-diagram.eps</a><br><br><a href="#">eaton-xeffect-frcmm-rccb-wiring-diagram.jpg</a>                                                                                                                                          |

|                                                                 |                                                                                  |
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|                                                                 | be evaluated.                                                                    |
| <b>10.2.7 INSCRIPTIONS</b>                                      | Meets the product standard's requirements.                                       |
| <b>10.3 DEGREE OF PROTECTION OF ASSEMBLIES</b>                  | Does not apply, since the entire switchgear needs to be evaluated.               |
| <b>10.4 CLEARANCES AND CREEPAGE DISTANCES</b>                   | Meets the product standard's requirements.                                       |
| <b>10.5 PROTECTION AGAINST ELECTRIC SHOCK</b>                   | Does not apply, since the entire switchgear needs to be evaluated.               |
| <b>10.6 INCORPORATION OF SWITCHING DEVICES AND COMPONENTS</b>   | Does not apply, since the entire switchgear needs to be evaluated.               |
| <b>10.7 INTERNAL ELECTRICAL CIRCUITS AND CONNECTIONS</b>        | Is the panel builder's responsibility.                                           |
| <b>10.8 CONNECTIONS FOR EXTERNAL CONDUCTORS</b>                 | Is the panel builder's responsibility.                                           |
| <b>10.9.2 POWER-FREQUENCY ELECTRIC STRENGTH</b>                 | Is the panel builder's responsibility.                                           |
| <b>10.9.3 IMPULSE WITHSTAND VOLTAGE</b>                         | Is the panel builder's responsibility.                                           |
| <b>10.9.4 TESTING OF ENCLOSURES MADE OF INSULATING MATERIAL</b> | Is the panel builder's responsibility.                                           |
| <b>FITTED WITH:</b>                                             | Interlocking device                                                              |
| <b>FRAME</b>                                                    | 45 mm                                                                            |
| <b>FREQUENCY RATING</b>                                         | 50 Hz / 60 Hz                                                                    |
| <b>POLLUTION DEGREE</b>                                         | 2                                                                                |
| <b>LIFESPAN, MECHANICAL</b>                                     | 10000 operations                                                                 |
| <b>MOUNTING METHOD</b>                                          | Quick attachment with 2 latch positions for DIN-rail<br>IEC/EN 60715<br>DIN rail |
| <b>CLIMATIC PROOFING</b>                                        | 25-55 °C / 90-95% relative humidity according to IEC 60068-2                     |
| <b>EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT</b>            | 7.8 W                                                                            |
| <b>RATED IMPULSE WITHSTAND VOLTAGE (UIMP)</b>                   | 4 kV                                                                             |
| <b>RATED SHORT-TIME WITHSTAND CURRENT (ICW)</b>                 | 10 kA                                                                            |
| <b>ADMISSIBLE BACK-UP FUSE OVERLOAD - MAX</b>                   | 40 A gG/gL                                                                       |
| <b>AMBIENT HUMDITY</b>                                          | 5 - 95 %                                                                         |

| RANGE                                                          |                                                                  |
|----------------------------------------------------------------|------------------------------------------------------------------|
| <b>BUILT-IN WIDTH<br/>(NUMBER OF UNITS)</b>                    | 35 mm (2 SU)                                                     |
| <b>SHORT-CIRCUIT RATING</b>                                    | Max. admissible back-up fuse: 63 A gG/gL, 70 A class J fuse (UL) |
| <b>STATUS INDICATION</b>                                       | White / blue                                                     |
| <b>TERMINAL PROTECTION</b>                                     | Finger and hand touch safe, DGUV VS3, EN 50274                   |
| <b>TERMINALS (TOP AND BOTTOM)</b>                              | Lift terminals                                                   |
| <b>TEST CIRCUIT RANGE</b>                                      | 184 V AC - 250 V AC, 196 V AC - 305 V AC (UL)                    |
| <b>AMBIENT OPERATING TEMPERATURE - MAX</b>                     | 40 °C                                                            |
| <b>AMBIENT OPERATING TEMPERATURE - MIN</b>                     | -25 °C                                                           |
| <b>BUILT-IN DEPTH</b>                                          | 70.5 mm                                                          |
| <b>CONNECTABLE CONDUCTOR CROSS SECTION (MULTI-WIRED) - MAX</b> | 16 mm <sup>2</sup>                                               |
| <b>CONNECTABLE CONDUCTOR CROSS SECTION (MULTI-WIRED) - MIN</b> | 1.5 mm <sup>2</sup>                                              |
| <b>CONNECTABLE CONDUCTOR CROSS SECTION (SOLID-CORE) - MAX</b>  | 35 mm <sup>2</sup>                                               |
| <b>CONNECTABLE CONDUCTOR CROSS SECTION (SOLID-CORE) - MIN</b>  | 1.5 mm <sup>2</sup>                                              |
| <b>FAULT CURRENT RATING</b>                                    | 300 mA                                                           |
| <b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT</b>            | 3.9 W                                                            |
| <b>OVERVOLTAGE TESTED - MAX</b>                                | 530 V                                                            |
| <b>PERMITTED STORAGE AND TRANSPORT TEMPERATURE - MAX</b>       | 60 °C                                                            |
| <b>PERMITTED STORAGE AND TRANSPORT TEMPERATURE - MIN</b>       | -35 °C                                                           |
| <b>CONTACT POSITION INDICATOR COLOR</b>                        | Red / green                                                      |
| <b>MOUNTING POSITION</b>                                       | As required                                                      |
| <b>DEGREE OF PROTECTION</b>                                    | IP20, IP40 with suitable enclosure                               |

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|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | IP20                                                                                                                                                                                                                                                                                                                                                                               |
| <b>IMPULSE WITHSTAND CURRENT</b>                                     | 3 kA (8/20 µs) surge-proof                                                                                                                                                                                                                                                                                                                                                         |
| <b>NUMBER OF POLES</b>                                               | Two-pole                                                                                                                                                                                                                                                                                                                                                                           |
| <b>LEAKAGE CURRENT TYPE</b>                                          | A                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>LIFESPAN, ELECTRICAL</b>                                          | 4000 operations                                                                                                                                                                                                                                                                                                                                                                    |
| <b>TYPE</b>                                                          | <ul style="list-style-type: none"> <li>• Current test marks as per inscription</li> <li>• Maximum operating temperature is 75 °C: Starting at 40 °C, the max. permissible continuous current decreases by 2.5% for every 1 °C</li> <li>• The maximum operating current of back-up fuse must not exceed the residual current circuit breaker's rated operational current</li> </ul> |
| <b>SPECIAL FEATURES</b>                                              | <ul style="list-style-type: none"> <li>• FRCmM-NA</li> <li>• Residual current circuit breakers</li> <li>• Type G/A (ÖVE E 8601)</li> </ul>                                                                                                                                                                                                                                         |
| <b>APPLICATION</b>                                                   | Switchgear for export to North America (UL-listed)                                                                                                                                                                                                                                                                                                                                 |
| <b>FUNCTIONS</b>                                                     | Short-time delayed tripping                                                                                                                                                                                                                                                                                                                                                        |
| <b>PICK-UP CURRENT</b>                                               | 200 mA                                                                                                                                                                                                                                                                                                                                                                             |
| <b>SENSITIVITY TYPE</b>                                              | Pulse-current sensitive                                                                                                                                                                                                                                                                                                                                                            |
| <b>TERMINAL CAPACITY (CABLE)</b>                                     | M5 (with cross-recessed screw as defined in EN ISO 4757-Z2, PZ2)                                                                                                                                                                                                                                                                                                                   |
| <b>RATED FAULT CURRENT - MAX</b>                                     | 0.3 A                                                                                                                                                                                                                                                                                                                                                                              |
| <b>RATED FAULT CURRENT - MIN</b>                                     | 0.3 A                                                                                                                                                                                                                                                                                                                                                                              |
| <b>RATED INSULATION VOLTAGE (UI)</b>                                 | 440 V                                                                                                                                                                                                                                                                                                                                                                              |
| <b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b> | 40 A                                                                                                                                                                                                                                                                                                                                                                               |
| <b>RATED OPERATIONAL VOLTAGE (UE) - MAX</b>                          | 277 V                                                                                                                                                                                                                                                                                                                                                                              |

|                                                            |                                                                   |
|------------------------------------------------------------|-------------------------------------------------------------------|
| <b>RATED RESIDUAL<br/>MAKING AND BREAKING<br/>CAPACITY</b> | 500 A                                                             |
| <b>SURGE CURRENT<br/>CAPACITY</b>                          | 3 kA                                                              |
| <b>WIDTH IN NUMBER OF<br/>MODULAR SPACINGS</b>             | 2                                                                 |
| <b>VOLTAGE RATING (IEC/EN<br/>60947-2)</b>                 | 240 V AC / 415 V AC                                               |
| <b>VOLTAGE RATING (UL)</b>                                 | 480Y/277 V, 60 Hz                                                 |
| <b>VOLTAGE TYPE</b>                                        | AC                                                                |
| <b>TERMINAL CAPACITY<br/>(SOLID WIRE)</b>                  | 1.5 mm <sup>2</sup> - 35 mm <sup>2</sup>                          |
| <b>TRIPPING TIME</b>                                       | Short time-delayed<br>10 ms delay at 50 Hz<br>8 ms delay at 60 Hz |
| <b>RATED SHORT-CIRCUIT<br/>STRENGTH</b>                    | 10 kA with back-up fuse<br>5 kA (UL, as per CSA)                  |
| <b>TERMINAL CAPACITY<br/>(STRANDED CABLE)</b>              | 16 mm <sup>2</sup> (2x)                                           |
| <b>RAL-NUMBER</b>                                          | 7035                                                              |
| <b>COLOR</b>                                               | Gray                                                              |

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|------------------------|
| <b>PROJECT NAME:</b>   |
| <b>PROJECT NUMBER:</b> |
| <b>PREPARED BY:</b>    |
| <b>DATE:</b>           |