

# Specifications



## Eaton 167893

Eaton Moeller series xEffect - FRCdM Type B, B+, Bfq RCCB, 40 A, 4p, 30 mA, type G/B

### General specifications

|                     |                                                           |
|---------------------|-----------------------------------------------------------|
| <b>PRODUCT NAME</b> | Eaton Moeller series xEffect - FRCdM Type B, B+, Bfq RCCB |
|---------------------|-----------------------------------------------------------|

|                       |        |
|-----------------------|--------|
| <b>CATALOG NUMBER</b> | 167893 |
|-----------------------|--------|

|                   |                    |
|-------------------|--------------------|
| <b>MODEL CODE</b> | FRCdM-40/4/003-G/B |
|-------------------|--------------------|

|            |               |
|------------|---------------|
| <b>EAN</b> | 4015081644698 |
|------------|---------------|

|                             |       |
|-----------------------------|-------|
| <b>PRODUCT LENGTH/DEPTH</b> | 76 mm |
|-----------------------------|-------|

|                       |       |
|-----------------------|-------|
| <b>PRODUCT HEIGHT</b> | 80 mm |
|-----------------------|-------|

|                      |       |
|----------------------|-------|
| <b>PRODUCT WIDTH</b> | 70 mm |
|----------------------|-------|

|                       |         |
|-----------------------|---------|
| <b>PRODUCT WEIGHT</b> | 0.32 kg |
|-----------------------|---------|

|                    |              |
|--------------------|--------------|
| <b>COMPLIANCES</b> | RoHS conform |
|--------------------|--------------|

|                       |                                                                      |
|-----------------------|----------------------------------------------------------------------|
| <b>CERTIFICATIONS</b> | IEC/EN 62423<br>IEC/EN 61008<br>ÖVE E 8601<br>EN45545-2<br>IEC 61373 |
|-----------------------|----------------------------------------------------------------------|



Powering Business Worldwide

## Additional information

### FEATURES

Residual current circuit-breakers, digital  
Additional equipment possible  
Selective protection

### FITTED WITH:

Interlocking device

### FUNCTIONS

Short-time delayed tripping

### SPECIAL FEATURES

- Current test marks as per inscription
- Dry auxiliary contact: > 100,000 electrical switching operations per minute at 2 A 30 VDC resistive load
- Dry auxiliary contact: > 5 x 100,000 electrical switching operations per minute at 1 A 30 VDC resistive load
- Maximum operating temperature is 60 °C in accordance with the de-rating table

### USED WITH

Residual current circuit-breakers, digital  
FRCdM  
Type G/B (ÖVE E 8601)

## Delivery programme

### AMPERAGE RATING

40 A

### APPLICATION

xEffect - Switchgear for industrial and advanced commercial applications

### FAULT CURRENT RATING

30 mA

### IMPULSE WITHSTAND CURRENT

3 kA (8/20 µs) surge-proof

### NUMBER OF POLES

Four-pole

### RATED SHORT-CIRCUIT STRENGTH

10 kA

### SENSITIVITY TYPE

All current sensitive

### TRIPPING TIME

10 ms delayed  
Short time-delayed

### TYPE

- FRCdM
- Residual current circuit-breakers, digital
- Type G/B (ÖVE E 8601)

## Design verification to IEC/EN 61439

|                                                                                         |                                                                                                                                  |
|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <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 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</b>                                                                  | Does not apply, since the                                                                                                        |

## Design verification to IEC/EN 61439 - technical data

|                                                                      |        |
|----------------------------------------------------------------------|--------|
| <b>AMBIENT OPERATING TEMPERATURE - MAX</b>                           | 60 °C  |
| <b>AMBIENT OPERATING TEMPERATURE - MIN</b>                           | -25 °C |
| <b>EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT</b>                 | 6.2 W  |
| <b>HEAT DISSIPATION CAPACITY</b>                                     | 6.2 W  |
| <b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT</b>                  | 0 W    |
| <b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b> | 40 A   |
| <b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT</b>                | 0 W    |

|                                                                 |                                                                    |
|-----------------------------------------------------------------|--------------------------------------------------------------------|
| <b>AGAINST ELECTRIC SHOCK</b>                                   | 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.                             |

## Technical data - electrical

|                                                    |                                     |
|----------------------------------------------------|-------------------------------------|
| <b>ADMISSIBLE BACK-UP FUSE</b>                     | 63 A gG/gL                          |
| <b>ADMISSIBLE BACK-UP FUSE OVERLOAD - MAX</b>      | 40 A gG/gL                          |
| <b>FREQUENCY RATING</b>                            | 50 Hz                               |
| <b>LEAKAGE CURRENT TYPE</b>                        | B                                   |
| <b>LIFESPAN, ELECTRICAL</b>                        | 4000 operations                     |
| <b>POLLUTION DEGREE</b>                            | 2                                   |
| <b>RATED FAULT CURRENT - MAX</b>                   | 0.03 A                              |
| <b>RATED FAULT CURRENT - MIN</b>                   | 0.03 A                              |
| <b>RATED IMPULSE WITHSTAND VOLTAGE (UIMP)</b>      | 4 kV                                |
| <b>RATED INSULATION VOLTAGE (UI)</b>               | 440 V                               |
| <b>RATED OPERATIONAL VOLTAGE (UE) - MAX</b>        | 415 V                               |
| <b>RATED RESIDUAL MAKING AND BREAKING CAPACITY</b> | 500 A                               |
| <b>RATED SHORT-TIME WITHSTAND CURRENT (ICW)</b>    | 10 kA                               |
| <b>SHORT-CIRCUIT RATING</b>                        | 63 A (max. admissible back-up fuse) |
| <b>SURGE CURRENT CAPACITY</b>                      | 3 kA                                |
| <b>TEST CIRCUIT RANGE</b>                          | 196 V AC - 264 V AC                 |
| <b>VOLTAGE RATING - MAX</b>                        | 456 VAC                             |
| <b>VOLTAGE RATING - MIN</b>                        | 50 VAC                              |
| <b>VOLTAGE RATING (IEC/EN 60947-2)</b>             | 240 V AC / 415 V AC                 |

## Technical Data - electrical - dry auxiliary contact

|                                                                                   |                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------|
| <b>RATED SWITCHING CAPACITY (RESISTIVE LOAD) OF AUXILIARY CONTACT AT 240 V AC</b> | 0.25 A                                     |
| <b>RATED SWITCHING CAPACITY (RESISTIVE LOAD) OF AUXILIARY CONTACT AT 30 V DC</b>  | 2 A                                        |
| <b>SWITCHING CAPACITY OF AUXILIARY CONTACT - MIN</b>                              | 10 µA, 10 mV DC                            |
| <b>SWITCHING CURRENT OF AUXILIARY CONTACT - MAX</b>                               | 2 A                                        |
| <b>SWITCHING DUTY WITH RESISTIVE LOAD OF AUXILIARY CONTACT - MAX</b>              | 60 W                                       |
| <b>SWITCHING VOLTAGE AT AC OF AUXILIARY CONTACT - MAX</b>                         | 240 V                                      |
| <b>SWITCHING VOLTAGE AT DC OF AUXILIARY CONTACT - MAX</b>                         | 220 V                                      |
| <b>TERMINAL CAPACITY OF AUXILIARY CONTACT</b>                                     | 0.25 mm <sup>2</sup> - 1.5 mm <sup>2</sup> |

## Technical data - mechanical

|                                                                            |                                                                               |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| <b>BUILT-IN DEPTH</b>                                                      | 70.5 mm                                                                       |
| <b>BUILT-IN WIDTH<br/>(NUMBER OF UNITS)</b>                                | 70 mm (4 SU)                                                                  |
| <b>BUSBAR MATERIAL<br/>THICKNESS</b>                                       | 0.8 mm - 2 mm                                                                 |
| <b>CLIMATIC PROOFING</b>                                                   | 25-55 °C / 90-95% relative humidity according to IEC 60068-2                  |
| <b>CONNECTABLE<br/>CONDUCTOR CROSS<br/>SECTION (MULTI-WIRED)<br/>- MAX</b> | 16 mm <sup>2</sup>                                                            |
| <b>CONNECTABLE<br/>CONDUCTOR CROSS<br/>SECTION (MULTI-WIRED)<br/>- MIN</b> | 1.5 mm <sup>2</sup>                                                           |
| <b>CONNECTABLE<br/>CONDUCTOR CROSS<br/>SECTION (SOLID-CORE) -<br/>MAX</b>  | 35 mm <sup>2</sup>                                                            |
| <b>CONNECTABLE<br/>CONDUCTOR CROSS<br/>SECTION (SOLID-CORE) -<br/>MIN</b>  | 1.5 mm <sup>2</sup>                                                           |
| <b>CONTACT POSITION<br/>INDICATOR COLOR</b>                                | Red / green                                                                   |
| <b>DEGREE OF PROTECTION</b>                                                | IP20, IP40 with suitable enclosure<br>IP20                                    |
| <b>FRAME</b>                                                               | 45 mm                                                                         |
| <b>LIFESPAN, MECHANICAL</b>                                                | 20000 operations                                                              |
| <b>MOUNTING METHOD</b>                                                     | DIN rail<br>Quick attachment with 2 latch positions for DIN-rail IEC/EN 60715 |
| <b>MOUNTING POSITION</b>                                                   | As required                                                                   |
| <b>PERMITTED STORAGE<br/>AND TRANSPORT<br/>TEMPERATURE - MAX</b>           | 60 °C                                                                         |
| <b>PERMITTED STORAGE<br/>AND TRANSPORT<br/>TEMPERATURE - MIN</b>           | -35 °C                                                                        |
| <b>STATUS INDICATION</b>                                                   | White / blue                                                                  |
| <b>TERMINAL CAPACITY<br/>(CABLE)</b>                                       | M5 (with cross-recessed screw as defined in EN ISO 4757-Z2, PZ2)              |
| <b>TERMINAL CAPACITY<br/>(SOLID WIRE)</b>                                  | 1.5 mm <sup>2</sup> - 35 mm <sup>2</sup>                                      |
| <b>TERMINAL CAPACITY<br/>(STRANDED CABLE)</b>                              | 16 mm <sup>2</sup> (2x)                                                       |

## Resources

|                            |                                                                                                                                                                                                          |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| APPLICATION NOTES          | <a href="#">eaton-quality-standards-for-railway-applications-application-paper-ap003005en-en-us.pdf</a>                                                                                                  |
| BROCHURES                  | <a href="#">eaton-xeffect-digital-switchgear-brochure-br003004en-en-us.pdf</a>                                                                                                                           |
| CATALOGUES                 | <a href="#">eaton-xeffect-frcdm-rccb-catalog-ca003017en-en-us.pdf</a>                                                                                                                                    |
| CHARACTERISTIC CURVE       | <a href="#">eaton-mcb-xeffect-frcdm-rccb-characteristic-curve.eps</a><br><a href="#">eaton-current-xeffect-frcdm-rccb-characteristic-curve-003.jpg</a>                                                   |
| DECLARATIONS OF CONFORMITY | <a href="#">eaton-rccb-declaration-of-conformity-eu250053en.pdf</a><br><a href="#">eaton-rccb-declaration-of-conformity-uk251415en.pdf</a>                                                               |
| DRAWINGS                   | <a href="#">eaton-current-xeffect-frcdm-rccb-dimensions.jpg</a>                                                                                                                                          |
| ECAD MODEL                 | <a href="#">DA-CE-ETN.FRCDM-40 4 003-G B</a>                                                                                                                                                             |
| INSTALLATION INSTRUCTIONS  | <a href="#">eaton-residual-current-circuit-breakers-frcdm-instruction-leaflet-il019013zu.pdf</a>                                                                                                         |
| INSTALLATION VIDEOS        | <a href="#">xEffect Digital Switchgear</a>                                                                                                                                                               |
| MCAD MODEL                 | <a href="#">eaton-rccb-mcad-drawings-frcdm-rccb-4p.dwg</a><br><a href="#">eaton-residual-current-circuit-breakers-3d-models-frcdm-rccb-4p.stp</a><br><a href="#">eaton-rccb-mcad-drawings-167880.dwg</a> |
| PEP ECO-PASSPORT           | <a href="#">eaton-residual-current-circuit-breakers-pep-eato-00110-v0101-en.pdf</a>                                                                                                                      |
| WIRING DIAGRAMS            | <a href="#">eaton-xeffect-frcdm-rccb-wiring-diagram.jpg</a><br><a href="#">eaton-xeffect-frcdm-rccb-wiring-diagram-002.jpg</a><br><a href="#">eaton-current-xeffect-frcdm-rccb-wiring-diagram.jpg</a>    |

|                                            |                                                |
|--------------------------------------------|------------------------------------------------|
| <b>TERMINAL PROTECTION</b>                 | Finger and hand touch safe, DGUV VS3, EN 50274 |
| <b>TERMINALS (TOP AND BOTTOM)</b>          | Twin-purpose terminals                         |
| <b>TIGHTENING TORQUE</b>                   | 2 Nm - 2.4 Nm                                  |
| <b>WIDTH IN NUMBER OF MODULAR SPACINGS</b> | 4                                              |

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



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