

# Specifications



Photo is representative

## Eaton 170431

Eaton Moeller series xEffect - FRCmM Type AC, A, U, R RCCB. Residual current circuit breaker (RCCB), 25A, 2p, 30mA, type A

### General specifications

|                             |                                                                  |
|-----------------------------|------------------------------------------------------------------|
| <b>PRODUCT NAME</b>         | Eaton Moeller series<br>xEffect - FRCmM Type AC,<br>A, U, R RCCB |
| <b>CATALOG NUMBER</b>       | 170431                                                           |
| <b>MODEL CODE</b>           | FRCMM-25/2/003-A                                                 |
| <b>EAN</b>                  | 4015081669189                                                    |
| <b>PRODUCT LENGTH/DEPTH</b> | 76 mm                                                            |
| <b>PRODUCT HEIGHT</b>       | 80 mm                                                            |
| <b>PRODUCT WIDTH</b>        | 35 mm                                                            |
| <b>PRODUCT WEIGHT</b>       | 0.187 kg                                                         |
| <b>COMPLIANCES</b>          | RoHS conform                                                     |
| <b>CERTIFICATIONS</b>       | IEC/EN 61008<br>EN45545-2<br>IEC 61373                           |



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## Additional information

### FEATURES

Residual current circuit breaker  
Additional equipment possible

### FITTED WITH:

Interlocking device

### SPECIAL FEATURES

- Current test marks as per inscription
- Maximum operating temperature is 55 °C: Starting at 40 °C, the max. permissible continuous current decreases by 3% for every 1 °C

### USED WITH

FRCmM  
Type A  
Residual current circuit breakers

## Delivery programme

### AMPERAGE RATING

25 A

### APPLICATION

- Switchgear for industrial and advanced commercial applications
- xEffect - Switchgear for industrial and advanced commercial applications

### FAULT CURRENT RATING

30 mA

### IMPULSE WITHSTAND CURRENT

250 A (8/20 µs) surge-proof  
Partly surge-proof 250 A

### NUMBER OF POLES

Two-pole

### RATED SHORT-CIRCUIT STRENGTH

10 kA with back-up fuse

### SENSITIVITY TYPE

Pulse-current sensitive

### TRIPPING TIME

Non-delayed

### TYPE

- FRCmM
- Residual current circuit breakers
- Type A

## 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>                           | 40 °C  |
| <b>AMBIENT OPERATING TEMPERATURE - MIN</b>                           | -25 °C |
| <b>EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT</b>                 | 2 W    |
| <b>HEAT DISSIPATION CAPACITY</b>                                     | 0 W    |
| <b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT</b>                  | 1 W    |
| <b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b> | 25 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 OVERLOAD - MAX</b>      | 25 A gG/gL                          |
| <b>FREQUENCY RATING</b>                            | 50 Hz / 60 Hz                       |
| <b>LEAKAGE CURRENT TYPE</b>                        | A                                   |
| <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>        | 240 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>                      | 0.25 kA                             |
| <b>TEST CIRCUIT RANGE</b>                          | 184 V AC - 250 V AC                 |
| <b>VOLTAGE RATING (IEC/EN 60947-2)</b>             | 240 V AC                            |

## Technical data - mechanical

|                                                                |                                                                                  |
|----------------------------------------------------------------|----------------------------------------------------------------------------------|
| <b>BUILT-IN DEPTH</b>                                          | 70.5 mm                                                                          |
| <b>BUILT-IN WIDTH (NUMBER OF UNITS)</b>                        | 35 mm (2 SU)                                                                     |
| <b>BUSBAR MATERIAL 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 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>CONTACT POSITION 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>                                         | Quick attachment with 2 latch positions for DIN-rail<br>IEC/EN 60715<br>DIN rail |
| <b>MOUNTING POSITION</b>                                       | As required                                                                      |
| <b>PERMITTED STORAGE AND TRANSPORT TEMPERATURE - MAX</b>       | 60 °C                                                                            |
| <b>PERMITTED STORAGE AND TRANSPORT TEMPERATURE - MIN</b>       | -35 °C                                                                           |
| <b>STATUS INDICATION</b>                                       | White / blue                                                                     |
| <b>TERMINAL CAPACITY (CABLE)</b>                               | M5 (with cross-recessed screw as defined in EN ISO 4757-Z2, PZ2)                 |
| <b>TERMINAL CAPACITY (SOLID WIRE)</b>                          | 1.5 mm <sup>2</sup> - 35 mm <sup>2</sup>                                         |
| <b>TERMINAL CAPACITY (STRANDED CABLE)</b>                      | 16 mm <sup>2</sup> (2x)                                                          |

|                                            |                                                |
|--------------------------------------------|------------------------------------------------|
| <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> | 2                                              |

## Resources

|                            |                                                                                                                                                                                                                  |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BROCHURES                  | <a href="#">eaton-pdd-railrolling-stock-brochure-br011002en-en-us.pdf</a>                                                                                                                                        |
| DECLARATIONS OF CONFORMITY | <a href="#">eaton-rccb-declaration-of-conformity-uk251420en.pdf</a><br><a href="#">eaton-rccb-declaration-of-conformity-eu250057en.pdf</a>                                                                       |
| DRAWINGS                   | <a href="#">eaton-xeffect-faz-na-mcb-dimensions.jpg</a><br><a href="#">eaton-circuit-breaker-xeffect-frcmm-na-rccb-dimensions.eps</a><br><a href="#">eaton-circuit-breaker-xeffect-frcmm-rccb-dimensions.jpg</a> |
| ECAD MODEL                 | <a href="#">ETN.FRCMM-25 2 003-A.edz</a>                                                                                                                                                                         |
| INSTALLATION INSTRUCTIONS  | <a href="#">eaton-mcb-rccb-rcbo-g9-il019140zu.pdf</a>                                                                                                                                                            |
| MCAD MODEL                 | <a href="#">eaton-residual-current-circuit-breakers-3d-models-f9-ul1053-2p.stp</a><br><a href="#">eaton-residual-current-circuit-breakers-3d-models-frcmm-2p.stp</a>                                             |
| PEP ECO-PASSPORT           | <a href="#">eaton-residual-current-circuit-breakers-pep-eato-00111-v0101-en.pdf</a>                                                                                                                              |
| WIRING DIAGRAMS            | <a href="#">eaton-circuit-breaker-xeffect-frcmm-rccb-wiring-diagram.eps</a><br><a href="#">eaton-xeffect-frcmm-rccb-wiring-diagram.jpg</a>                                                                       |

|                 |
|-----------------|
| PROJECT NAME:   |
| PROJECT NUMBER: |
| PREPARED BY:    |
| DATE:           |



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