



**Digital residual current circuit-breaker, all-current sensitive, 40 A, 4p, 300 mA, type S/BFQ**

**Part no.** FRCDM-40/4/03-S/BFQ  
**Catalog No.** 167909  
**Alternate Catalog No.** FRCDM-40/4/03-S/BFQ  
**EL-Nummer (Norway)** 1664178

Similar to illustration

## Delivery program

|                              |                |      |                                                              |
|------------------------------|----------------|------|--------------------------------------------------------------|
| Basic function               |                |      | Residual current circuit-breakers , digital                  |
| Number of poles              |                |      | 4 pole                                                       |
| Application                  |                |      | Residual current circuit-breaker - frequency converter-proof |
| Rated current                | $I_n$          | A    | 40                                                           |
| Rated short-circuit strength | $I_{cn}$       | kA   | 10                                                           |
| Rated fault current          | $I_{\Delta N}$ | A    | 0.3                                                          |
| Type                         |                |      | Type S/Bfq                                                   |
| Tripping                     |                | s... | selective switch off                                         |
| Product range                |                |      | FRCDM                                                        |
| Sensitivity                  |                |      | All current sensitive - frequency converter-proof            |
| Impulse withstand current    |                |      | surge-proof 5 kA                                             |
| Contact sequence             |                |      |                                                              |

## Technical data

### Electrical

|                                                                                  |                      |      |                                                   |
|----------------------------------------------------------------------------------|----------------------|------|---------------------------------------------------|
| Types conform to                                                                 |                      |      | IEC/EN 61008<br>IEC/EN 62423                      |
| Standards                                                                        |                      |      | IEC/EN 61008<br>EN 45545-2; IEC 61373             |
| Current test marks                                                               |                      |      | As per inscription                                |
| Tripping                                                                         |                      | s... | 40 ms delay - selective switch off                |
| Rated voltage according to IEC/EN 60947-2                                        | $U_n$                | V AC | 240/415                                           |
| Rated frequency                                                                  | f                    | Hz   | 50                                                |
| Limit values of the operating voltage                                            |                      |      |                                                   |
| electronic                                                                       |                      | V AC | 50 - 456                                          |
| Test circuit                                                                     |                      | V AC | 196 - 456                                         |
| Rated fault current                                                              | $I_{\Delta n}$       | mA   | 300                                               |
| Sensitivity                                                                      |                      |      | All current sensitive - frequency converter-proof |
| Enhanced sensitivity                                                             |                      |      | Suitable for variable frequency drives            |
| Rated insulation voltage                                                         | $U_i$                | V    | 440                                               |
| Rated impulse withstand voltage                                                  | $U_{imp}$            | kV   | 4                                                 |
| Rated short-circuit strength                                                     | $I_{cn}$             | kA   | 10                                                |
| Impulse withstand current                                                        |                      |      | 5 kA (8/20 $\mu$ s) surge-proof                   |
| Max. admissible back-up fuse                                                     |                      |      |                                                   |
| Short-circuit                                                                    | gG/gL                | A    | 63                                                |
| Overload                                                                         | gG/gL                | A    | 40                                                |
| Rated making and breaking capacity / Rated residual making and breaking capacity | $I_m / I_{\Delta m}$ | A    | 500                                               |
| lifespan                                                                         |                      |      |                                                   |

|            |            |         |
|------------|------------|---------|
| Electrical | Operations | ≥ 4000  |
| Mechanical | Operations | ≥ 20000 |

### Dry auxiliary contact

|                                                                              |                 |                       |
|------------------------------------------------------------------------------|-----------------|-----------------------|
| Rated switching capacity                                                     |                 |                       |
| 30 VDC (resistive load)                                                      | A               | 2                     |
| 240 VAC (resistive load)                                                     | A               | 0.25                  |
| Max. switching duty (resistive load)                                         | W               | 60                    |
| Max. switching voltage AC                                                    | V               | 240                   |
| Max. switching voltage DC                                                    | V               | 220                   |
| Maximum switching current                                                    | A               | 2                     |
| Min. switching capacity (reference value)                                    |                 | 10 µA, 10 mV DC       |
| lifespan                                                                     |                 |                       |
| Electrical (at 20 switching operations per minute) 2 A 30 VDC resistive load | Operations      | ≥ 10 <sup>5</sup>     |
| Electrical (at 20 switching operations per minute) 1 A 30 VDC resistive load | Operations      | ≥ 5 x 10 <sup>5</sup> |
| Terminal capacity                                                            | mm <sup>2</sup> | 0.25 - 1.5            |

### Mechanical

|                                                |                 |                                                                           |
|------------------------------------------------|-----------------|---------------------------------------------------------------------------|
| Standard front dimension                       | mm              | 45                                                                        |
| Device height                                  | mm              | 80                                                                        |
| Built-in width                                 | mm              | 70 (4TE)                                                                  |
| Mounting                                       |                 | Quick attachment with 2 latch positions for DIN-rail IEC/EN 60715         |
| Degree of Protection                           |                 | IP20, IP40 with suitable enclosure                                        |
| Terminals top and bottom                       |                 | Twin-purpose terminals                                                    |
| Terminal protection                            |                 | finger and hand touch safe, DGUV VS3, EN 50274                            |
| Terminal cross-section                         |                 |                                                                           |
| Solid                                          | mm <sup>2</sup> | 1.5 - 35                                                                  |
| Stranded                                       | mm <sup>2</sup> | 2 x 16                                                                    |
| Terminal cross-section                         |                 | M5 (with cross-recessed screw as defined in EN ISO 4757-Z2, Pozidriv PZ2) |
| Tightening torque of fixing screws             | N/m             | 2 - 2.4                                                                   |
| Thickness of busbar material                   | mm              | 0.8 - 2                                                                   |
| Admissible ambient temperature range           | °C              | -25 - +60                                                                 |
| Permissible storage and transport temperatures | °C              | -35 - +60                                                                 |
| Climatic proofing                              |                 | 25-55°C/90-95% relative humidity according to IEC 60068-2                 |
| Mounting position                              |                 | As required                                                               |
| Contact position indicator                     |                 | red / green                                                               |
| Trip indication                                |                 | white / blue                                                              |

## Design verification as per IEC/EN 61439

|                                                                                                                        |                   |    |                                                                               |
|------------------------------------------------------------------------------------------------------------------------|-------------------|----|-------------------------------------------------------------------------------|
| Technical data for design verification                                                                                 |                   |    |                                                                               |
| Rated operational current for specified heat dissipation                                                               | I <sub>n</sub>    | A  | 40                                                                            |
| Heat dissipation per pole, current-dependent                                                                           | P <sub>vid</sub>  | W  | 0                                                                             |
| Equipment heat dissipation, current-dependent                                                                          | P <sub>vid</sub>  | W  | 6.2                                                                           |
| Static heat dissipation, non-current-dependent                                                                         | P <sub>vs</sub>   | W  | 0                                                                             |
| Heat dissipation capacity                                                                                              | P <sub>diss</sub> | W  | 0                                                                             |
| Operating ambient temperature min.                                                                                     |                   | °C | -25                                                                           |
| Operating ambient temperature max.                                                                                     |                   | °C | 60                                                                            |
|                                                                                                                        |                   |    | Maximum operating temperature is 60 °C in accordance with the de-rating table |
| IEC/EN 61439 design verification                                                                                       |                   |    |                                                                               |
| 10.2 Strength of materials and parts                                                                                   |                   |    |                                                                               |
| 10.2.2 Corrosion resistance                                                                                            |                   |    | Meets the product standard's requirements.                                    |
| 10.2.3.1 Verification of thermal stability of enclosures                                                               |                   |    | Meets the product standard's requirements.                                    |
| 10.2.3.2 Verification of resistance of insulating materials to normal heat                                             |                   |    | Meets the product standard's requirements.                                    |
| 10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects |                   |    | Meets the product standard's requirements.                                    |
| 10.2.4 Resistance to ultra-violet (UV) radiation                                                                       |                   |    | Meets the product standard's requirements.                                    |
| 10.2.5 Lifting                                                                                                         |                   |    | Does not apply, since the entire switchgear needs to be evaluated.            |

|                                                          |  |                                                                                                                                  |
|----------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------|
| 10.2.6 Mechanical impact                                 |  | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.2.7 Inscriptions                                      |  | Meets the product standard's requirements.                                                                                       |
| 10.3 Degree of protection of ASSEMBLIES                  |  | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.4 Clearances and creepage distances                   |  | Meets the product standard's requirements.                                                                                       |
| 10.5 Protection against electric shock                   |  | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.6 Incorporation of switching devices and components   |  | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.7 Internal electrical circuits and connections        |  | Is the panel builder's responsibility.                                                                                           |
| 10.8 Connections for external conductors                 |  | Is the panel builder's responsibility.                                                                                           |
| 10.9 Insulation properties                               |  |                                                                                                                                  |
| 10.9.2 Power-frequency electric strength                 |  | Is the panel builder's responsibility.                                                                                           |
| 10.9.3 Impulse withstand voltage                         |  | Is the panel builder's responsibility.                                                                                           |
| 10.9.4 Testing of enclosures made of insulating material |  | Is the panel builder's responsibility.                                                                                           |
| 10.10 Temperature rise                                   |  | The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices. |
| 10.11 Short-circuit rating                               |  | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| 10.12 Electromagnetic compatibility                      |  | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| 10.13 Mechanical function                                |  | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.                         |

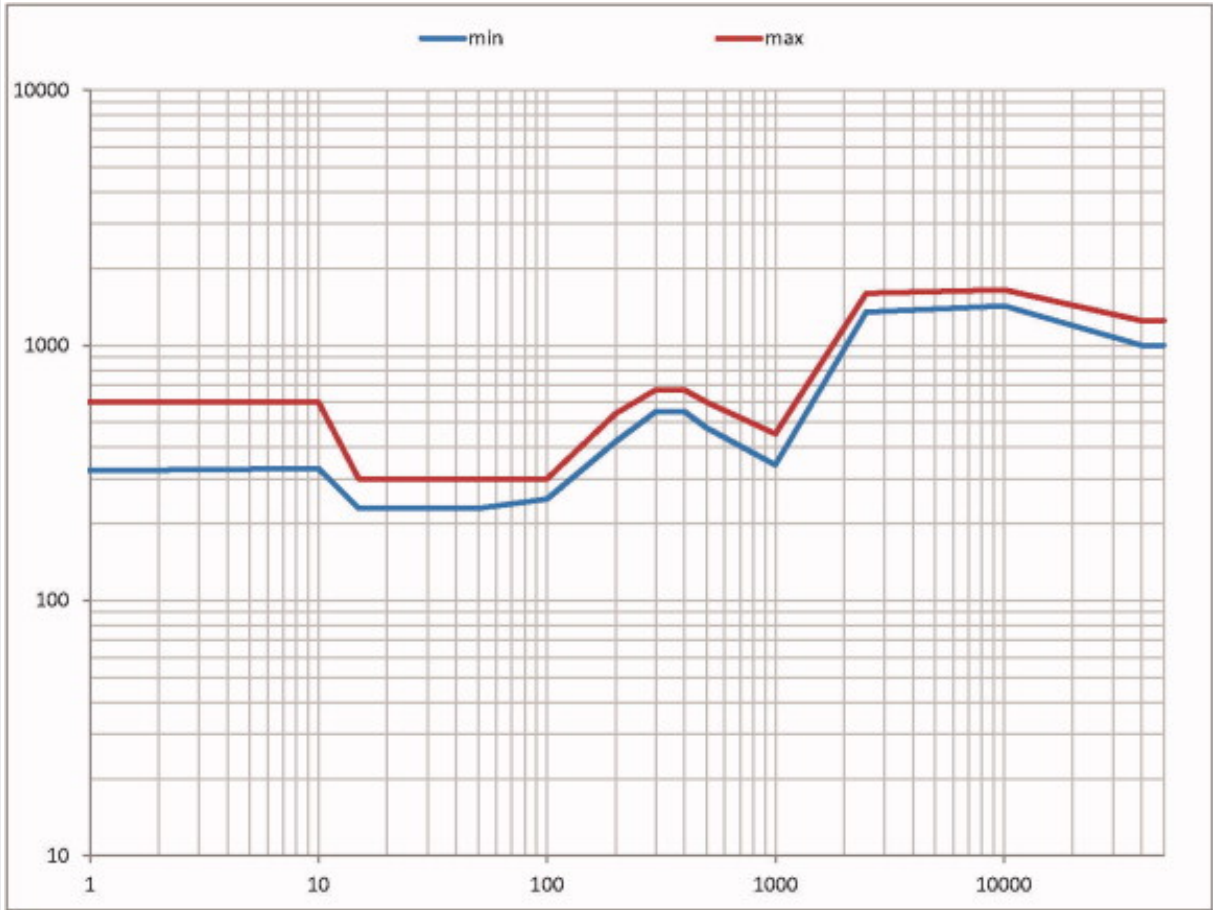
## Technical data ETIM 7.0

Circuit breakers and fuses (EG000020) / Residual current circuit breaker (RCCB) (EC000003)

Electric engineering, automation, process control engineering / Electrical installation, device / Residual current protection system / Residual current circuit breaker (RCCB)  
(ecI@ss10.0.1-27-14-22-01 [AAB906014])

|                                                    |                 |          |
|----------------------------------------------------|-----------------|----------|
| Number of poles                                    |                 | 4        |
| Rated voltage                                      | V               | 415      |
| Rated current                                      | A               | 40       |
| Rated fault current                                | mA              | 300      |
| Rated insulation voltage U <sub>i</sub>            | V               | 440      |
| Rated impulse withstand voltage U <sub>imp</sub>   | kV              | 4        |
| Mounting method                                    |                 | DIN rail |
| Leakage current type                               |                 | B        |
| Selective protection                               |                 | Yes      |
| Short-time delayed tripping                        |                 | No       |
| Short-circuit breaking capacity (I <sub>cn</sub> ) | kA              | 10       |
| Surge current capacity                             | kA              | 5        |
| Frequency                                          |                 | 50 Hz    |
| Additional equipment possible                      |                 | Yes      |
| With interlocking device                           |                 | Yes      |
| Degree of protection (IP)                          |                 | IP20     |
| Width in number of modular spacings                |                 | 4        |
| Built-in depth                                     | mm              | 70.5     |
| Ambient temperature during operating               | °C              | -25 - 60 |
| Pollution degree                                   |                 | 2        |
| Connectable conductor cross section multi-wired    | mm <sup>2</sup> | 1.5 - 16 |
| Connectable conductor cross section solid-core     | mm <sup>2</sup> | 1.5 - 35 |

Characteristics

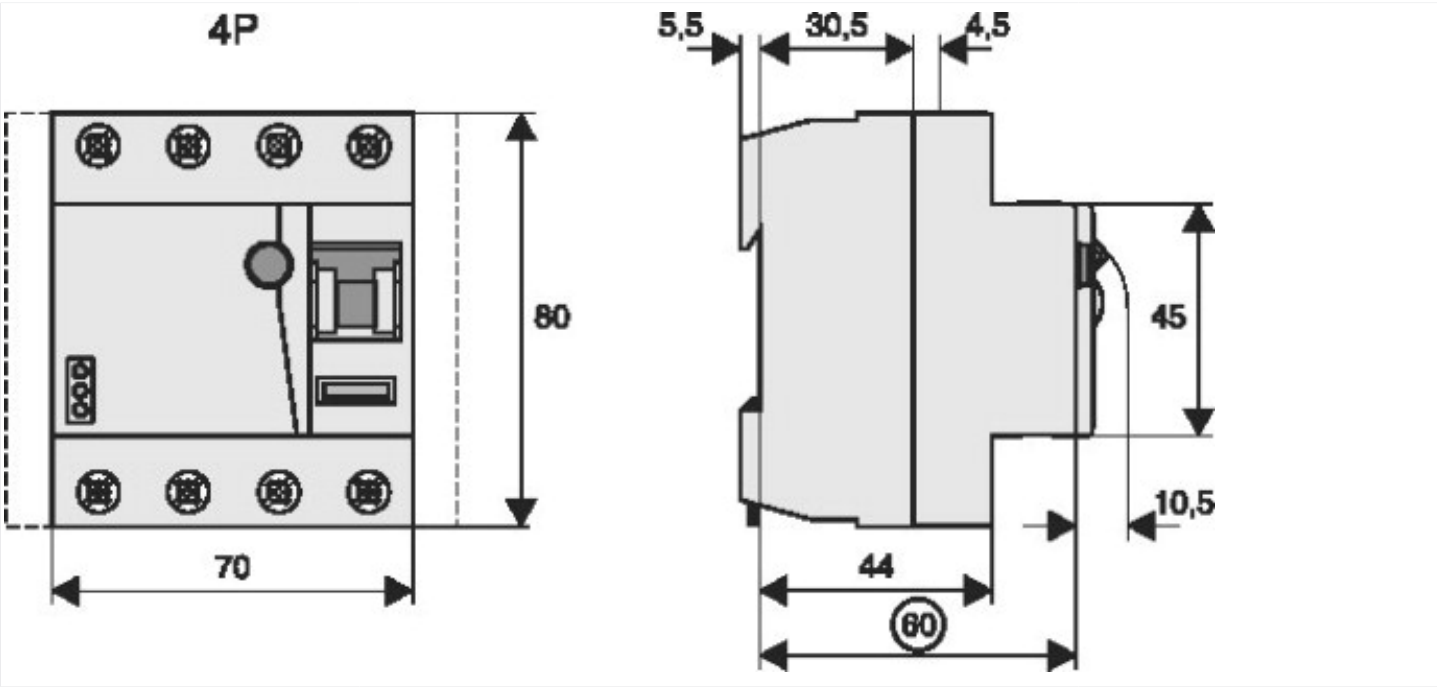


Tripping current frequency range: | FRCdM, 300 mA, type Bfq

| Influence of the ambient temperature<br>to the maximum continuous current<br>(A) |                       |                       |                       |
|----------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|
| Range                                                                            | FRCdM type B, Bfq, B+ |                       |                       |
| Ambient<br>temperature                                                           | Amperage              |                       |                       |
|                                                                                  | RCCB<br>rating<br>25A | RCCB<br>rating<br>40A | RCCB<br>rating<br>63A |
| 40°                                                                              | 25                    | 40                    | 63                    |
| 45°                                                                              | 25                    | 40                    | 56                    |
| 50°                                                                              | 25                    | 40                    | 50                    |
| 55°                                                                              | 25                    | 35                    | 45                    |
| 60°                                                                              | 25                    | 30                    | 40                    |

Derating - table FRCdM\_B

Dimensions



Additional product information (links)

Product overview (Web)

<http://www.eaton.eu/Europe/Electrical/ProductsServices/CircuitProtection/DigitalCircuitBreakers/index.htm>

