

# Specifications

## Eaton 136509

Eaton Moeller® series ZEB Overload relay,  
Separate mounting, Earth-fault protection:  
with, Ir= 20 - 100 A, 1 N/O, 1 N/C

### General specifications

|                                 |                                                                                                                                                                                                            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PRODUCT NAME</b>             | Eaton Moeller® series ZEB<br>Electronic overload relay                                                                                                                                                     |
| <b>CATALOG NUMBER</b>           | 136509                                                                                                                                                                                                     |
| <b>MODEL CODE</b>               | ZEB150-100-GF/KK                                                                                                                                                                                           |
| <b>EAN</b>                      | 4015081332892                                                                                                                                                                                              |
| <b>PRODUCT<br/>LENGTH/DEPTH</b> | 140.5 mm                                                                                                                                                                                                   |
| <b>PRODUCT HEIGHT</b>           | 120 mm                                                                                                                                                                                                     |
| <b>PRODUCT WIDTH</b>            | 56 mm                                                                                                                                                                                                      |
| <b>PRODUCT WEIGHT</b>           | 0.84 kg                                                                                                                                                                                                    |
| <b>CERTIFICATIONS</b>           | CSA Class No.: 3211-03<br>CSA-C22.2 No. 14<br>UL<br>UL 508<br>VDE 0660<br>IEC/EN 60947<br>UL File No.: E1230<br>CSA<br>CSA File No.: 2290956<br>UL Category Control No.:<br>NKCR<br>CE<br>IEC/EN 60947-4-1 |
| <b>CATALOG NOTES</b>            | Rated operational current:<br>Switch-on and switch-off<br>conditions based on DC-<br>13, time constant as<br>specified.                                                                                    |

## Climatic environmental conditions

|                                            |       |
|--------------------------------------------|-------|
| <b>AMBIENT OPERATING TEMPERATURE - MAX</b> | 65 °C |
|--------------------------------------------|-------|

|                                            |        |
|--------------------------------------------|--------|
| <b>AMBIENT OPERATING TEMPERATURE - MIN</b> | -25 °C |
|--------------------------------------------|--------|

|                                                       |       |
|-------------------------------------------------------|-------|
| <b>AMBIENT OPERATING TEMPERATURE (ENCLOSED) - MAX</b> | 45 °C |
|-------------------------------------------------------|-------|

|                          |                                                                                |
|--------------------------|--------------------------------------------------------------------------------|
| <b>CLIMATIC PROOFING</b> | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30 |
|--------------------------|--------------------------------------------------------------------------------|

## Contacts

|                                                            |   |
|------------------------------------------------------------|---|
| <b>NUMBER OF AUXILIARY CONTACTS (CHANGE-OVER CONTACTS)</b> | 0 |
|------------------------------------------------------------|---|

|                                                                |   |
|----------------------------------------------------------------|---|
| <b>NUMBER OF AUXILIARY CONTACTS (NORMALLY CLOSED CONTACTS)</b> | 1 |
|----------------------------------------------------------------|---|

|                                                              |   |
|--------------------------------------------------------------|---|
| <b>NUMBER OF AUXILIARY CONTACTS (NORMALLY OPEN CONTACTS)</b> | 1 |
|--------------------------------------------------------------|---|

|                                                      |   |
|------------------------------------------------------|---|
| <b>NUMBER OF CONTACTS (NORMALLY CLOSED CONTACTS)</b> | 1 |
|------------------------------------------------------|---|

|                                                    |   |
|----------------------------------------------------|---|
| <b>NUMBER OF CONTACTS (NORMALLY OPEN CONTACTS)</b> | 1 |
|----------------------------------------------------|---|

## Design verification

|                                                                                         |                                                                                                                                  |
|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <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                                                                                                        |

## Electrical rating

|                                                                              |                                                                                                                                                                                                     |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CONVENTIONAL THERMAL CURRENT ITH OF AUXILIARY CONTACTS (1-POLE, OPEN)</b> | 5 A                                                                                                                                                                                                 |
| <b>RATED FREQUENCY - MAX</b>                                                 | 60 Hz                                                                                                                                                                                               |
| <b>RATED FREQUENCY - MIN</b>                                                 | 50 Hz                                                                                                                                                                                               |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-15, 120 V</b>                        | 1.5 A                                                                                                                                                                                               |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-15, 220 V, 230 V, 240 V</b>          | 1.5 A                                                                                                                                                                                               |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-15, 380 V, 400 V, 415 V</b>          | 0.9 A                                                                                                                                                                                               |
| <b>RATED OPERATIONAL CURRENT (IE) AT DC-13, 110 V</b>                        | 0.4 A                                                                                                                                                                                               |
| <b>RATED OPERATIONAL CURRENT (IE) AT DC-13, 220 V, 230 V</b>                 | 0.2 A                                                                                                                                                                                               |
| <b>RATED OPERATIONAL CURRENT (IE) AT DC-13, 24 V</b>                         | 0.9 A                                                                                                                                                                                               |
| <b>RATED OPERATIONAL CURRENT (IE) AT DC-13, 60 V</b>                         | 0.75 A                                                                                                                                                                                              |
| <b>RATED OPERATIONAL VOLTAGE (UE) AT AC - MAX</b>                            | 690 V                                                                                                                                                                                               |
| <b>SAFE ISOLATION</b>                                                        | 240 V AC, Between auxiliary contacts, According to EN 61140<br>440 V, Between auxiliary contacts and main contacts, According to EN 61140<br>600 V AC, Between main circuits, According to EN 61140 |
| <b>SHORT-CIRCUIT CURRENT RATING (HIGH FAULT AT 600 V)</b>                    | 200 A, Class J, max. Fuse, SCCR (UL/CSA)<br>100 kA, Fuse, SCCR (UL/CSA)                                                                                                                             |
| <b>SHORT-CIRCUIT PROTECTION RATING</b>                                       | Max. 6 A gG/gL, fuse, Without welding, Auxiliary and control circuits                                                                                                                               |
| <b>SWITCHING CAPACITY (AUXILIARY CONTACTS, PILOT DUTY)</b>                   | R300, DC operated (UL/CSA)<br>B600, AC operated (UL/CSA)                                                                                                                                            |

|                                                                      |                                                                    |
|----------------------------------------------------------------------|--------------------------------------------------------------------|
| <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.                             |
| <b>EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID</b>            | 25.4 W                                                             |
| <b>HEAT DISSIPATION CAPACITY PDISS</b>                               | 0 W                                                                |
| <b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID</b>             | 8.47 W                                                             |
| <b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b> | 100 A                                                              |
| <b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS</b>            | 0 W                                                                |

| Features & functions          |                                                                                               |
|-------------------------------|-----------------------------------------------------------------------------------------------|
| <b>EARTH FAULT PROTECTION</b> | Yes<br>Trip at approx. $> 0.5 \times I_r$ in 2 s<br>Trip at approx. $> 1.5 \times I_r$ in 1 s |
| <b>FEATURES</b>               | Phase-failure sensitivity (according to IEC/EN 60947, VDE 0660 Part 102)                      |
| <b>FUNCTIONS</b>              | Filament bulb (24 V)                                                                          |

|                             |       |
|-----------------------------|-------|
| <b>VOLTAGE RATING - MAX</b> | 600 V |
|-----------------------------|-------|

| General information                           |                                                   |
|-----------------------------------------------|---------------------------------------------------|
| <b>CLASS</b>                                  | Adjustable                                        |
| <b>DEGREE OF PROTECTION</b>                   | IP20                                              |
| <b>MOUNTING METHOD</b>                        | Separate positioning<br>Separate mounting         |
| <b>OVERLOAD RELEASE CURRENT SETTING - MAX</b> | 100 A                                             |
| <b>OVERLOAD RELEASE CURRENT SETTING - MIN</b> | 20 A                                              |
| <b>OVERVOLTAGE CATEGORY</b>                   | III                                               |
| <b>POLLUTION DEGREE</b>                       | 3                                                 |
| <b>PRODUCT CATEGORY</b>                       | Electronic overload relays<br>ZEB                 |
| <b>PROTECTION</b>                             | Finger and back-of-hand proof, Protection against |

|                                               |                                                                                                                            |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
|                                               | direct contact when actuated from front (EN 50274)                                                                         |
| <b>RATED IMPULSE WITHSTAND VOLTAGE (UIMP)</b> | 6000 V (auxiliary circuits)<br>6000 V AC                                                                                   |
| <b>SHOCK RESISTANCE</b>                       | 15 g, Mechanical,<br>According to IEC/EN 60068-2-27, Shock<br>duration 10 ms<br>Mechanical, According to IEC/EN 60068-2-27 |
| <b>SUITABLE FOR</b>                           | Branch circuits, (UL/CSA)                                                                                                  |
| <b>VOLTAGE TYPE</b>                           | Self powered<br>AC                                                                                                         |

## Terminal capacities

|                                                          |                                                                                                                                                       |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SCREW SIZE</b>                                        | M3.5, Terminal screw,<br>Control circuit cables                                                                                                       |
| <b>SCREWDRIVER SIZE</b>                                  | 2, Terminal screw, Control<br>circuit cables, Pozidriv<br>screwdriver<br>1 x 6 mm, Terminal screw,<br>Control circuit cables,<br>Standard screwdriver |
| <b>STRIPPING LENGTH<br/>(CONTROL CIRCUIT<br/>CABLE)</b>  | 8 mm                                                                                                                                                  |
| <b>STRIPPING LENGTH<br/>(MAIN CABLE)</b>                 | 14 mm                                                                                                                                                 |
| <b>TERMINAL CAPACITY<br/>(FLEXIBLE WITH<br/>FERRULE)</b> | 2 x (0.75 - 2.5) mm <sup>2</sup> ,<br>Control circuit cables                                                                                          |
| <b>TERMINAL CAPACITY<br/>(SOLID)</b>                     | 2 x (0.75 - 4) mm <sup>2</sup> , Control<br>circuit cables<br>1 x (16 - 50) mm <sup>2</sup> , Main<br>cables                                          |
| <b>TERMINAL CAPACITY<br/>(SOLID/STRANDED AWG)</b>        | 2 x (18 - 12), Control circuit<br>cables<br>1 x (6 - 1), Main cables                                                                                  |
| <b>TIGHTENING TORQUE</b>                                 | 7 lb-in, Screw terminals<br>0.8 - 1.2 Nm, Screw<br>terminals, Control circuit<br>cables                                                               |

## Resources

|                                   |                                                                                                                                                                                                                                                            |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BROCHURES</b>                  | <a href="#">eaton-motor-starters-system-xstart-brochure-br03407001en-en-us.pdf</a><br><br><a href="#">Electronic overload relay ZEB</a>                                                                                                                    |
| <b>DECLARATIONS OF CONFORMITY</b> | <a href="#">eaton-electronic-overload-relay-declaration-of-conformity-eu260060en.pdf</a>                                                                                                                                                                   |
| <b>DRAWINGS</b>                   | <a href="#">eaton-tripping-devices-zeb-overload-relay-dimensions-004.eps</a><br><br><a href="#">eaton-tripping-devices-zeb-overload-relay-characteristic-curve.eps</a><br><br><a href="#">eaton-tripping-devices-zeb-overload-relay-3d-drawing-008.eps</a> |
| <b>ECAD MODEL</b>                 | <a href="#">ETN.136509.edz</a>                                                                                                                                                                                                                             |
| <b>INSTALLATION INSTRUCTIONS</b>  | <a href="#">IL04210002E</a>                                                                                                                                                                                                                                |
| <b>MCAD MODEL</b>                 | <a href="#">zeb150_100_kk.stp</a><br><br><a href="#">eaton-overload-relays-mcad-drawings-zeb150-100-kk.dwg</a><br><br><a href="#">eaton-general-release-zeb-overload-relay-wiring-diagram.eps</a>                                                          |
| <b>WIRING DIAGRAMS</b>            | <a href="#">eaton-tripping-devices-overload-relay-zeb-overload-relay-wiring-diagram.eps</a>                                                                                                                                                                |

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



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