

# Specifications



## Eaton 136501

Eaton Moeller® series ZEB Overload relay,  
Separate mounting, Earth-fault protection:  
with,  $I_r = 9 - 45 \text{ A}$ , 1 N/O, 1 N/C

### General specifications

|                             |                                                                                                                                                                                                            |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PRODUCT NAME</b>         | Eaton Moeller® series ZEB<br>Electronic overload relay                                                                                                                                                     |
| <b>CATALOG NUMBER</b>       | 136501                                                                                                                                                                                                     |
| <b>EAN</b>                  | 4015081332816                                                                                                                                                                                              |
| <b>PRODUCT LENGTH/DEPTH</b> | 108 mm                                                                                                                                                                                                     |
| <b>PRODUCT HEIGHT</b>       | 110 mm                                                                                                                                                                                                     |
| <b>PRODUCT WIDTH</b>        | 45 mm                                                                                                                                                                                                      |
| <b>PRODUCT WEIGHT</b>       | 0.359 kg                                                                                                                                                                                                   |
| <b>CERTIFICATIONS</b>       | CE<br>UL File No.: E1230<br>CSA File No.: 2290956<br>CSA Class No.: 3211-03<br>UL<br>UL 508<br>CSA-C22.2 No. 14<br>IEC/EN 60947<br>VDE 0660<br>CSA<br>UL Category Control No.:<br>NKCR<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.                                                                                    |
| <b>MODEL CODE</b>           | ZEB32-45-GF/KK                                                                                                                                                                                             |

## Features & Functions

|                               |                                                                          |
|-------------------------------|--------------------------------------------------------------------------|
| <b>EARTH FAULT PROTECTION</b> | Yes                                                                      |
|                               | Trip at approx. $> 0.5 \times I_r$ in 2 s                                |
|                               | 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)                                                     |

## Climatic environmental conditions

|                                                       |                                                                                |
|-------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>AMBIENT OPERATING TEMPERATURE - MIN</b>            | -25 °C                                                                         |
| <b>AMBIENT OPERATING TEMPERATURE - MAX</b>            | 65 °C                                                                          |
| <b>AMBIENT OPERATING TEMPERATURE (ENCLOSED) - MAX</b> | 65 °C                                                                          |
| <b>CLIMATIC PROOFING</b>                              | Damp heat, cyclic, to IEC 60068-2-30<br>Damp heat, constant, to IEC 60068-2-78 |

## General

|                                               |                                                                                                                      |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>CLASS</b>                                  | Adjustable                                                                                                           |
| <b>DEGREE OF PROTECTION</b>                   | IP20                                                                                                                 |
| <b>MOUNTING METHOD</b>                        | Separate positioning<br>Separate mounting                                                                            |
| <b>OVERLOAD RELEASE CURRENT SETTING - MIN</b> | 9 A                                                                                                                  |
| <b>OVERLOAD RELEASE CURRENT SETTING - MAX</b> | 45 A                                                                                                                 |
| <b>OVERVOLTAGE CATEGORY</b>                   | III                                                                                                                  |
| <b>POLLUTION DEGREE</b>                       | 3                                                                                                                    |
| <b>PRODUCT CATEGORY</b>                       | Electronic overload relays 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, According to IEC/EN 60068-2-27, Shock 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                                                                                                         |

## Terminal capacities

|                                                  |                                                                                                         |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>TERMINAL CAPACITY (FLEXIBLE WITH FERRULE)</b> | 2 x (0.75 - 2.5) mm <sup>2</sup> ,<br>Control circuit cables                                            |
| <b>TERMINAL CAPACITY (SOLID)</b>                 | 1 x (1.5 - 16) mm <sup>2</sup> , Main cables<br>2 x (0.75 - 4) mm <sup>2</sup> , Control circuit cables |
| <b>TERMINAL CAPACITY (SOLID/STRANDED AWG)</b>    | 2 x (18 - 12), Control circuit cables<br>1 x (14 - 4), Main cables                                      |
| <b>STRIPPING LENGTH (MAIN CABLE)</b>             | 13 mm                                                                                                   |
| <b>STRIPPING LENGTH (CONTROL CIRCUIT CABLE)</b>  | 8 mm                                                                                                    |
| <b>SCREW SIZE</b>                                | M3.5, Terminal screw, Control circuit cables                                                            |

|                          |                                                                                           |
|--------------------------|-------------------------------------------------------------------------------------------|
| <b>SCREWDRIVER SIZE</b>  | 2, Terminal screw, Pozidriv screwdriver<br>1 x 6 mm, Terminal screw, Standard screwdriver |
| <b>TIGHTENING TORQUE</b> | 0.8 - 1.2 Nm, Screw terminals, Control circuit cables<br>7 lb-in, Screw terminals         |

## Electrical rating

**CONVENTIONAL  
THERMAL CURRENT ITH  
OF AUXILIARY CONTACTS  
(1-POLE, OPEN)** 5 A

**RATED CONTROL SUPPLY  
VOLTAGE (US) AT AC, 50  
HZ - MIN** 0 V

**RATED CONTROL SUPPLY  
VOLTAGE (US) AT AC, 50  
HZ - MAX** 0 V

**RATED CONTROL SUPPLY  
VOLTAGE (US) AT AC, 60  
HZ - MIN** 0 V

**RATED CONTROL SUPPLY  
VOLTAGE (US) AT AC, 60  
HZ - MAX** 0 V

**RATED CONTROL SUPPLY  
VOLTAGE (US) AT DC -  
MIN** 0 V

**RATED CONTROL SUPPLY  
VOLTAGE (US) AT DC -  
MAX** 0 V

**RATED FREQUENCY - MIN** 50 Hz

**RATED FREQUENCY -  
MAX** 60 Hz

**RATED OPERATIONAL  
CURRENT (IE) AT AC-15,  
120 V** 1.5 A

**RATED OPERATIONAL  
CURRENT (IE) AT AC-15,  
220 V, 230 V, 240 V** 1.5 A

**RATED OPERATIONAL  
CURRENT (IE) AT AC-15,  
380 V, 400 V, 415 V** 0.9 A

**RATED OPERATIONAL  
CURRENT (IE) AT DC-13,  
110 V** 0.4 A

**RATED OPERATIONAL  
CURRENT (IE) AT DC-13,  
220 V, 230 V** 0.2 A

**RATED OPERATIONAL  
CURRENT (IE) AT DC-13,  
24 V** 0.9 A

**RATED OPERATIONAL  
CURRENT (IE) AT DC-13,  
60 V** 0.75 A

**RATED OPERATIONAL  
VOLTAGE (UE) AT AC -  
MAX** 690 V

**SHORT-CIRCUIT  
PROTECTION RATING** Max. 6 A gG/gL, fuse,  
Without welding, Auxiliary

## Contacts

**NUMBER OF AUXILIARY  
CONTACTS (CHANGE-  
OVER CONTACTS)** 0

**NUMBER OF AUXILIARY  
CONTACTS (NORMALLY  
CLOSED CONTACTS)** 1

**NUMBER OF AUXILIARY  
CONTACTS (NORMALLY  
OPEN CONTACTS)** 1

**NUMBER OF CONTACTS  
(NORMALLY CLOSED  
CONTACTS)** 1

**NUMBER OF CONTACTS  
(NORMALLY OPEN  
CONTACTS)** 1

|                                                            |                                                                        |
|------------------------------------------------------------|------------------------------------------------------------------------|
|                                                            | and control circuits                                                   |
| <b>SHORT-CIRCUIT CURRENT RATING (HIGH FAULT AT 600 V)</b>  | 100 kA, Fuse, SCCR (UL/CSA)<br>60 A, Class J, max. Fuse, SCCR (UL/CSA) |
| <b>SWITCHING CAPACITY (AUXILIARY CONTACTS, PILOT DUTY)</b> | R300, DC operated (UL/CSA)<br>B600, AC operated (UL/CSA)               |
| <b>VOLTAGE RATING - MAX</b>                                | 600 V                                                                  |

## Design verification

|                                                           |       |
|-----------------------------------------------------------|-------|
| <b>EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID</b> | 4.3 W |
|-----------------------------------------------------------|-------|

|                                        |     |
|----------------------------------------|-----|
| <b>HEAT DISSIPATION CAPACITY PDISS</b> | 0 W |
|----------------------------------------|-----|

|                                                          |        |
|----------------------------------------------------------|--------|
| <b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID</b> | 1.43 W |
|----------------------------------------------------------|--------|

|                                                                      |      |
|----------------------------------------------------------------------|------|
| <b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b> | 45 A |
|----------------------------------------------------------------------|------|

|                                                           |     |
|-----------------------------------------------------------|-----|
| <b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS</b> | 0 W |
|-----------------------------------------------------------|-----|

|                                    |                                            |
|------------------------------------|--------------------------------------------|
| <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 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. |
|---------------------------------------------------------------|--------------------------------------------------------------------|

## ETIM only

|                                                   |                  |
|---------------------------------------------------|------------------|
| <b>ELECTRICAL CONNECTION TYPE OF MAIN CIRCUIT</b> | Screw connection |
|---------------------------------------------------|------------------|

|                                       |     |
|---------------------------------------|-----|
| <b>ADJUSTABLE CURRENT RANGE - MIN</b> | 9 A |
|---------------------------------------|-----|

|                                       |      |
|---------------------------------------|------|
| <b>ADJUSTABLE CURRENT RANGE - MAX</b> | 45 A |
|---------------------------------------|------|

|                       |                       |
|-----------------------|-----------------------|
| <b>RESET FUNCTION</b> | Automatic Push-button |
|-----------------------|-----------------------|

|                                                                 |                                                                                                                                  |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <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>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.                         |

## Resources

### BROCHURES

[eaton-motor-starters-system-xstart-brochure-br03407001en-en-us.pdf](#)

[Electronic overload relay ZEB](#)

### DRAWINGS

[eaton-tripping-devices-relay-zeb-overload-relay-dimensions.eps](#)

[eaton-tripping-devices-zeb-overload-relay-characteristic-curve.eps](#)

[eaton-tripping-devices-relay-zeb-overload-relay-3d-drawing.eps](#)

### ECAD MODEL

[ETN.136501.edz](#)

### INSTALLATION INSTRUCTIONS

[IL04210002E](#)

### MCAD MODEL

[zeb32\\_kk.stp](#)

[zeb32\\_kk.dwg](#)

### WIRING DIAGRAMS

[eaton-general-release-zeb-overload-relay-wiring-diagram.eps](#)

[eaton-tripping-devices-overload-relay-zeb-overload-relay-wiring-diagram.eps](#)

**PROJECT NAME:**

**PROJECT NUMBER:**

**PREPARED BY:**

**DATE:**



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