

# Specifications



## Eaton 139573

Eaton Moeller® series Z5 Overload relay, Ir= 70 - 100 A, 1 N/O, 1 N/C, For use with: DILM185A, DILM225A

### General specifications

|                     |                                                 |
|---------------------|-------------------------------------------------|
| <b>PRODUCT NAME</b> | Eaton Moeller® series Z5 Thermal overload relay |
|---------------------|-------------------------------------------------|

|                       |        |
|-----------------------|--------|
| <b>CATALOG NUMBER</b> | 139573 |
|-----------------------|--------|

|                   |               |
|-------------------|---------------|
| <b>MODEL CODE</b> | Z5-100/FF225A |
|-------------------|---------------|

|            |               |
|------------|---------------|
| <b>EAN</b> | 4015081363513 |
|------------|---------------|

|                             |        |
|-----------------------------|--------|
| <b>PRODUCT LENGTH/DEPTH</b> | 146 mm |
|-----------------------------|--------|

|                       |        |
|-----------------------|--------|
| <b>PRODUCT HEIGHT</b> | 164 mm |
|-----------------------|--------|

|                      |        |
|----------------------|--------|
| <b>PRODUCT WIDTH</b> | 128 mm |
|----------------------|--------|

|                       |         |
|-----------------------|---------|
| <b>PRODUCT WEIGHT</b> | 1.47 kg |
|-----------------------|---------|

### CERTIFICATIONS

CSA Class No.: 3211-03  
IEC/EN 60947  
UL Category Control No.: NKCR  
UL File No.: E29184  
IEC/EN 60947-4-1  
CSA-C22.2 No. 60947-4-1-14  
VDE 0660  
CE  
CSA  
UL  
CSA File No.: 012528  
UL 60947-4-1



Powering Business Worldwide

## 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

## Design verification

### 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.

### 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 RESIST. OF INSUL. MAT. TO ABNORMAL HEAT/FIRE BY INTERNAL ELECT. 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

Does not apply, since the

|                                                                      |                                                                    |
|----------------------------------------------------------------------|--------------------------------------------------------------------|
| <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>            | 23.7 W                                                             |
| <b>HEAT DISSIPATION CAPACITY PDISS</b>                               | 0 W                                                                |
| <b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID</b>             | 7.9 W                                                              |
| <b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b> | 100 A                                                              |
| <b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS</b>            | 0 W                                                                |

## Electrical rating

**CONVENTIONAL  
THERMAL CURRENT ITH  
OF AUXILIARY CONTACTS  
(1-POLE, OPEN)** 6 A

**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) - MAX** 1000 V

**SAFE ISOLATION** 500 V AC, Between main  
circuits, According to EN  
61140  
240 V AC, Between  
auxiliary contacts,  
According to EN 61140  
440 V, Between auxiliary  
contacts and main  
contacts, According to EN  
61140

**SWITCHING CAPACITY  
(AUXILIARY CONTACTS,  
PILOT DUTY)** B600 at opposite polarity,  
AC operated (UL/CSA)  
R300, DC operated  
(UL/CSA)  
B300 at opposite polarity,  
AC operated (UL/CSA)

**VOLTAGE RATING - MAX** 600 VAC

## Features & functions

### FEATURES

Trip-free release  
Phase-failure sensitivity  
(according to IEC/EN  
60947, VDE 0660 Part 102)  
Test/off button  
Reset pushbutton  
manual/auto

## General information

|                                                       |                                                                                               |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>AMBIENT OPERATING TEMPERATURE - MAX</b>            | 60 °C                                                                                         |
| <b>AMBIENT OPERATING TEMPERATURE - MIN</b>            | -25 °C                                                                                        |
| <b>AMBIENT OPERATING TEMPERATURE (ENCLOSED) - MAX</b> | 40 °C                                                                                         |
| <b>AMBIENT OPERATING TEMPERATURE (ENCLOSED) - MIN</b> | -25 °C                                                                                        |
| <b>CLASS</b>                                          | CLASS 10 A / IEC 60947-4-1, 8.2.1.5.1.1. c) 4 min                                             |
| <b>CLIMATIC PROOFING</b>                              | Damp heat, cyclic, to IEC 60068-2-30<br>Damp heat, constant, to IEC 60068-2-78                |
| <b>DEGREE OF PROTECTION</b>                           | IP00                                                                                          |
| <b>MOUNTING METHOD</b>                                | Direct mounting<br>Direct attachment<br>Separate mounting                                     |
| <b>OVERLOAD RELEASE CURRENT SETTING - MAX</b>         | 100 A                                                                                         |
| <b>OVERLOAD RELEASE CURRENT SETTING - MIN</b>         | 70 A                                                                                          |
| <b>OVERVOLTAGE CATEGORY</b>                           | III                                                                                           |
| <b>POLLUTION DEGREE</b>                               | 3                                                                                             |
| <b>PRODUCT CATEGORY</b>                               | Overload relay Z5                                                                             |
| <b>PROTECTION</b>                                     | With terminal cover,<br>Protection against direct contact when actuated from front (EN 50274) |
| <b>RATED IMPULSE WITHSTAND VOLTAGE (UIMP)</b>         | 8000 V AC<br>4000 V (auxiliary and control circuits)                                          |
| <b>SHOCK RESISTANCE</b>                               | 10 g, Mechanical,<br>Sinusoidal, Shock duration 10 ms                                         |
| <b>SUITABLE FOR</b>                                   | Branch circuits, (UL/CSA)                                                                     |
| <b>TEMPERATURE COMPENSATION</b>                       | Continuous<br>≤ 0.25 %/K, residual error for T > 40°                                          |

## Short-circuit rating

|                                                    |                                                                                                                                                                                                                                                |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SHORT-CIRCUIT CURRENT RATING (BASIC RATING)</b> | 10 kA, SCCR (UL/CSA)<br>400 A Class J, max. Fuse, SCCR (UL/CSA)<br>400 A, max. CB, SCCR (UL/CSA)                                                                                                                                               |
| <b>SHORT-CIRCUIT PROTECTION RATING</b>             | Max. 6 A gG/gL, fuse, Without welding, Auxiliary and control circuits<br>315 A gG/gL, Fuse, Type "1" coordination<br>200 A gG/gL, Fuse, Type "2" coordination<br>Information on Type "1" and Type "2" coordination applies to 100 kA and 690 V |

## Terminal capacities

|                                                            |                                                                                                                                                       |
|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SCREW SIZE</b>                                          | M10 x 35, Terminal screw,<br>Main connections<br>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>TERMINAL CAPACITY<br/>(BUSBAR)</b>                      | 25 mm width, Main<br>connection                                                                                                                       |
| <b>TERMINAL CAPACITY<br/>(FLEXIBLE WITH CABLE<br/>LUG)</b> | 185 mm <sup>2</sup>                                                                                                                                   |
| <b>TERMINAL CAPACITY<br/>(FLEXIBLE WITH<br/>FERRULE)</b>   | 2 x (0.75 - 2.5) mm <sup>2</sup> ,<br>Control circuit cables<br>1 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 (0.75 - 4) mm <sup>2</sup> , Control<br>circuit cables                              |
| <b>TERMINAL CAPACITY<br/>(SOLID/STRANDED AWG)</b>          | 2/0 - 500 MCM, Main<br>cables<br>2 x (18 - 14), Control circuit<br>cables                                                                             |
| <b>TERMINAL CAPACITY<br/>(STRANDED WITH CABLE<br/>LUG)</b> | 185 mm <sup>2</sup>                                                                                                                                   |
| <b>TIGHTENING TORQUE</b>                                   | 1.2 Nm, Screw terminals,<br>Control circuit cables<br>18 Nm, Main cable<br>connection screw/bolt                                                      |
| <b>WIDTH ACROSS FLATS</b>                                  | 16 mm (Hexagon head<br>spanner SW)                                                                                                                    |

## Resources

|                            |                                                                                                                                                                                    |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CATALOGUES                 | <a href="#">eaton-product-overview-for-machinery-catalogue-ca08103003zen-en-us.pdf</a>                                                                                             |
| CHARACTERISTIC CURVE       | <a href="#">eaton-tripping-z5-overload-relay-characteristic-curve-003.eps</a><br><br><a href="#">eaton-tripping-z5-overload-relay-characteristic-curve.eps</a>                     |
| DECLARATIONS OF CONFORMITY | <a href="#">eaton-thermal-overload-relay-declaration-of-conformity-uk251268en.pdf</a><br><br><a href="#">eaton-thermal-overload-relay-declaration-of-conformity-eu250785en.pdf</a> |
| DRAWINGS                   | <a href="#">eaton-tripping-devices-overload-relay-z5-overload-relay-dimensions.eps</a><br><br><a href="#">eaton-tripping-devices-z5-overload-relay-3d-drawing.eps</a>              |
| ECAD MODEL                 | <a href="#">ETN.139573.edz</a>                                                                                                                                                     |
| INSTALLATION INSTRUCTIONS  | <a href="#">IL03407139Z</a><br><br><a href="#">eaton-overload-relays-z5-zb150-il03407006z.pdf</a><br><br><a href="#">z5_100_ff225a.stp</a>                                         |
| MCAD MODEL                 | <a href="#">eaton-thermal-overload-relay-mcad-drawings-z5-100-ff225a.dwg</a>                                                                                                       |
| SYSTEM OVERVIEW            | <a href="#">eaton-contactors-system55-dilm-explosion-drawing.eps</a>                                                                                                               |
| WIRING DIAGRAMS            | <a href="#">eaton-tripping-devices-overload-relay-zeb-overload-relay-wiring-diagram.eps</a><br><br><a href="#">eaton-general-release-zeb-overload-relay-wiring-diagram.eps</a>     |

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



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