

# Specifications



## Eaton 192399

Eaton Moeller® series EMS2 Reversing starter, 24 V DC, 0,18 - 3 A, Screw terminals, Controlled stop, PTB 19 ATEX 3000 EMS2-ROSF-Z-3-24VDC

### General specifications

|                     |                                                 |
|---------------------|-------------------------------------------------|
| <b>PRODUCT NAME</b> | Eaton Moeller® series<br>EMS2 Reversing starter |
|---------------------|-------------------------------------------------|

|                       |        |
|-----------------------|--------|
| <b>CATALOG NUMBER</b> | 192399 |
|-----------------------|--------|

|                   |                     |
|-------------------|---------------------|
| <b>MODEL CODE</b> | EMS2-ROSF-Z-3-24VDC |
|-------------------|---------------------|

|            |               |
|------------|---------------|
| <b>EAN</b> | 4015081930968 |
|------------|---------------|

|                             |          |
|-----------------------------|----------|
| <b>PRODUCT LENGTH/DEPTH</b> | 114.5 mm |
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|                       |        |
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| <b>PRODUCT HEIGHT</b> | 160 mm |
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|                      |         |
|----------------------|---------|
| <b>PRODUCT WIDTH</b> | 22.5 mm |
|----------------------|---------|

|                       |         |
|-----------------------|---------|
| <b>PRODUCT WEIGHT</b> | 0.35 kg |
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|                       |                                                                                                                                                                                                                                                                                                                 |
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| <b>CERTIFICATIONS</b> | IEC 61508<br>UL508<br>IEC/EN 60947-4-2<br>EN ISO 13849<br>UL File No.: E29096<br>UL Category Control No.:<br>NLDX, NLDX7<br>PTB 19 ATEX 3000<br>UL 60947-4-1<br>CSA-C22.2 No. 60947-4-1-<br>14<br>CE marking<br>UL listed<br>Certified by UL for use in<br>Canada<br>UL report applies to both<br>US and Canada |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Climatic environmental conditions

|                                                |       |
|------------------------------------------------|-------|
| <b>AMBIENT OPERATING<br/>TEMPERATURE - MAX</b> | 70 °C |
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|                                              |       |
|----------------------------------------------|-------|
| <b>AMBIENT STORAGE<br/>TEMPERATURE - MAX</b> | 80 °C |
|----------------------------------------------|-------|

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

|                                              |       |
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| <b>AMBIENT STORAGE<br/>TEMPERATURE - MIN</b> | 40 °C |
|----------------------------------------------|-------|

## Contacts

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

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

|                                                          |   |
|----------------------------------------------------------|---|
| <b>NUMBER OF CONTACTS<br/>(CHANGE-OVER<br/>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>RATED ACTUATING CURRENT (IC)</b>                                 | 5 mA                                                                                                                                                                                                                |
| <b>RATED CONTROL SUPPLY CURRENT IS</b>                              | 40 mA                                                                                                                                                                                                               |
| <b>RATED CONTROL SUPPLY VOLTAGE</b>                                 | 19.2 - 30 V DC                                                                                                                                                                                                      |
| <b>RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MAX</b>                | 24 V                                                                                                                                                                                                                |
| <b>RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MIN</b>                | 24 V                                                                                                                                                                                                                |
| <b>RATED CONTROL VOLTAGE (UC)</b>                                   | 24 V (Actuating circuit ON, L, R)                                                                                                                                                                                   |
| <b>RATED OPERATIONAL CURRENT (IE)</b>                               | 3 A                                                                                                                                                                                                                 |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-15, 220 V, 230 V, 240 V</b> | 2 A                                                                                                                                                                                                                 |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-3, 380 V, 400 V, 415 V</b>  | 3 A                                                                                                                                                                                                                 |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-51</b>                      | 3 A                                                                                                                                                                                                                 |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-53A - MAX</b>               | 3 A                                                                                                                                                                                                                 |
| <b>RATED OPERATIONAL CURRENT (IE) AT DC-13, 24 V</b>                | 2 A                                                                                                                                                                                                                 |
| <b>RATED OPERATIONAL POWER AT AC-3, 220/230 V, 50 HZ</b>            | 0.55 kW                                                                                                                                                                                                             |
| <b>RATED OPERATIONAL POWER AT AC-3, 380/400 V, 50 HZ</b>            | 1.1 kW                                                                                                                                                                                                              |
| <b>RATED OPERATIONAL POWER AT AC-53A, 380/400 V, 50 HZ</b>          | 1.1 kW                                                                                                                                                                                                              |
| <b>RATED OPERATIONAL VOLTAGE</b>                                    | 42 - 550 V<br>500 V AC                                                                                                                                                                                              |
| <b>SWITCHING LEVEL</b>                                              | 19.2 - 30 V DC, Switching level "High", Actuating circuit (ON, L, R)<br>< 5 V DC, Switching level "confirm Off", Actuating circuit (ON, L, R)<br>-3 - 9.6 V DC, Switching level "Low", Actuating circuit (ON, L, R) |

|                                                                      |                                                                    |
|----------------------------------------------------------------------|--------------------------------------------------------------------|
| <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>            | 3.5 W                                                              |
| <b>HEAT DISSIPATION CAPACITY PDISS</b>                               | 0 W                                                                |
| <b>HEAT DISSIPATION DETAILS</b>                                      | If necessary, Allow for derating                                   |
| <b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID</b>             | 0 W                                                                |
| <b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b> | 3 A                                                                |
| <b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS</b>            | 2 W                                                                |

## Electro magnetic compatibility

|                                 |                                                                    |
|---------------------------------|--------------------------------------------------------------------|
| <b>RADIO INTERFERENCE CLASS</b> | Class A (EN 61000-6-3, emitted interference, radiated)<br>EN 55011 |
|---------------------------------|--------------------------------------------------------------------|

## Features & functions

|                     |                                                                                                                       |
|---------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>FITTED WITH:</b> | fuse                                                                                                                  |
| <b>FUNCTIONS</b>    | Temperature compensated overload protection<br>DOL starting<br>Motor protection<br>Controlled stop<br>Reversing start |

## General information

|                                               |                                                                                                                                                                         |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CLASS</b>                                  | CLASS 10                                                                                                                                                                |
| <b>CONNECTION TO SMARTWIRE-DT</b>             | No                                                                                                                                                                      |
| <b>DEGREE OF PROTECTION</b>                   | IP20<br>NEMA Other                                                                                                                                                      |
| <b>MODEL</b>                                  | Reversing starter                                                                                                                                                       |
| <b>MOUNTING METHOD</b>                        | Mounting on Busbar 60 mm<br>Rail mounting possible<br>Motor starter Feeder System<br>Mounting on Busbar 30 mm<br>Top-hat rail fixing (according to IEC/EN 60715, 35 mm) |
| <b>MOUNTING POSITION</b>                      | Vertical<br>Motor feeder at bottom                                                                                                                                      |
| <b>OVERLOAD RELEASE CURRENT SETTING - MAX</b> | 3 A                                                                                                                                                                     |
| <b>OVERLOAD RELEASE CURRENT SETTING - MIN</b> | 0.18 A                                                                                                                                                                  |
| <b>PRODUCT CATEGORY</b>                       | Electronic motor starter                                                                                                                                                |
| <b>RESIDUAL RIPPLE</b>                        | ≤ 5 % (input voltage)                                                                                                                                                   |
| <b>TERMINAL CAPACITY</b>                      | 0.2 - 2.5 mm <sup>2</sup> , Main cables<br>0.14 - 2.5 mm <sup>2</sup> , Control circuit cables                                                                          |
| <b>TERMINAL CAPACITY (AWG)</b>                | 26 - 14, Control circuit cables<br>24 - 14, Main cables                                                                                                                 |
| <b>TYPE</b>                                   | Reversing starter (complete device)                                                                                                                                     |
| <b>VOLTAGE TYPE</b>                           | DC                                                                                                                                                                      |

## Safety

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EXPLOSION SAFETY CATEGORY FOR DUST</b> | ATEX dust-ex-protection, II (2) G [Ex e] [Ex d] [Ex px]<br>ATEX dust-ex-protection, II (2) D [Ex t] [Ex p]                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>SAFETY PARAMETER (EN ISO 13849-1)</b>  | PL e, Performance level (safe switch off)<br>3 (safe switch off), Category 60 (safe switch off) / 70 (motor protection) years; MTTFD                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>SAFETY PARAMETER (IEC 62061)</b>       | <p> <math>\Lambda</math>sd [FIT]: 0<br/> <math>\Lambda</math>su [FIT]: 1072 (Safe switch off) / 969 (Motor protection)<br/> 99 % (safe switch off) / 98 % (motor protection), DC<br/> Opening delay [ms]: 200 (safe switch off) / Class 10 (motor protection)<br/> SIL 3 (Safe switch off) / SIL 2 (Motor protection)<br/> PFHd [FIT]: 2.3 (Safe switch off)<br/> <math>\Lambda</math>dd [FIT]: 580 (Safe switch off) / 601 (Motor protection)<br/> 99 %, SFF<br/> <math>\Lambda</math>du [FIT]: 2.3 (Safe switch off) / 11 (Motor protection) </p> |

## Resources

|                            |                                                                                                                                                                      |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| APPLICATION NOTES          | <a href="#">eaton-motor-starter-ems2-setting-motor-protection-twincat3-ap034001-en-us.pdf</a>                                                                        |
| BROCHURES                  | <a href="#">eaton-ems2-electronic-motorstarter-brochure-br034001en-en-us.pdf</a>                                                                                     |
| CHARACTERISTIC CURVE       | <a href="#">eaton-contactors-ems2-reversing-starter-characteristic-curve-006.eps</a>                                                                                 |
|                            | <a href="#">eaton-contactors-ems2-reversing-starter-characteristic-curve.eps</a>                                                                                     |
|                            | <a href="#">eaton-contactors-ems2-reversing-starter-characteristic-curve-005.eps</a>                                                                                 |
|                            | <a href="#">eaton-contactors-ems2-reversing-starter-characteristic-curve-007.eps</a>                                                                                 |
| DECLARATIONS OF CONFORMITY | <a href="#">eaton-reversing-starter-declaration-of-conformity-uk251116en.pdf</a><br><a href="#">eaton-reversing-starter-declaration-of-conformity-eu250633en.pdf</a> |
| DRAWINGS                   | <a href="#">eaton-contactors-ems2-reversing-starter-dimensions-004.eps</a><br><a href="#">eaton-contactors-ems2-reversing-starter-3d-drawing-004.eps</a>             |
| ECAD MODEL                 | <a href="#">DA-CE-ETN.EMS2-ROSF-Z-3-24VDC</a>                                                                                                                        |
| INSTALLATION INSTRUCTIONS  | <a href="#">IL034089ZU</a>                                                                                                                                           |
| INSTALLATION VIDEOS        | <a href="#">Eaton's electronic motor starter EMS2</a>                                                                                                                |
| MANUALS AND USER GUIDES    | <a href="#">eaton-electronic-motor-starter-ems2-manual-mn034003en-us.pdf</a>                                                                                         |
| MCAD MODEL                 | <a href="#">eaton-motor-starter-mcad-drawings-ems2-rosf-z-24vdc.dwg</a><br><a href="#">DA-CS-ems2 rosf z 24vdc</a>                                                   |

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SALES NOTES

[eaton-ems2-electronic-  
motorstarter-flyer-  
f1034007en-en-us.pdf](#)

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**PROJECT NAME:**

**PROJECT NUMBER:**

**PREPARED BY:**

**DATE:**

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**Eaton Corporation plc** Eaton House  
30 Pembroke Road  
Dublin 4, Ireland  
Eaton.com

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