

# Specifications

## Eaton 031884

Eaton Moeller® series ETR4 Timing relay, star-delta, 50 ms, 1W, 3-60s, 24-240VAC/DC

### General specifications

|                             |                                                                                                                                                                                                                                                                           |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PRODUCT NAME</b>         | Eaton Moeller® series ETR4 Timing relay                                                                                                                                                                                                                                   |
| <b>CATALOG NUMBER</b>       | 031884                                                                                                                                                                                                                                                                    |
| <b>EAN</b>                  | 4015080318842                                                                                                                                                                                                                                                             |
| <b>PRODUCT LENGTH/DEPTH</b> | 103 mm                                                                                                                                                                                                                                                                    |
| <b>PRODUCT HEIGHT</b>       | 83 mm                                                                                                                                                                                                                                                                     |
| <b>PRODUCT WIDTH</b>        | 23 mm                                                                                                                                                                                                                                                                     |
| <b>PRODUCT WEIGHT</b>       | 0.115 kg                                                                                                                                                                                                                                                                  |
| <b>CERTIFICATIONS</b>       | UL 508<br>UL File No.: E29184<br>CE<br>CSA Class No.: 3211-03<br>CSA<br>CSA File No.: 012528<br>IEC/EN 61812-1<br>CSA-22.2 No. 14<br>IEC/EN 60947-5-1<br>IEC/EN 61000-4-3<br>UL<br>UL Category Control No.: NKCR<br>IEC/EN 61000-4-2<br>VDE 0435<br>Standard IEC/EN 61812 |
| <b>MODEL CODE</b>           | ETR4-51-A                                                                                                                                                                                                                                                                 |

## Climatic environmental conditions

|                                                       |                                                                                |
|-------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>AMBIENT OPERATING TEMPERATURE - MAX</b>            | 60 °C                                                                          |
| <b>AMBIENT STORAGE TEMPERATURE - MAX</b>              | 85 °C                                                                          |
| <b>AMBIENT OPERATING TEMPERATURE - MIN</b>            | -25 °C                                                                         |
| <b>AMBIENT OPERATING TEMPERATURE (ENCLOSED) - MAX</b> | 45 °C                                                                          |
| <b>AMBIENT OPERATING TEMPERATURE (ENCLOSED) - MIN</b> | 25 °C                                                                          |
| <b>AMBIENT STORAGE TEMPERATURE - MIN</b>              | 45 °C                                                                          |
| <b>CLIMATIC PROOFING</b>                              | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30 |

## 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                                                                                                        |

|                                                                      |                                                                    |
|----------------------------------------------------------------------|--------------------------------------------------------------------|
| <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>            | 0 W                                                                |
| <b>HEAT DISSIPATION CAPACITY PDISS</b>                               | 0 W                                                                |
| <b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID</b>             | 1.4 W                                                              |
| <b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b> | 6 A                                                                |
| <b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS</b>            | 1.8 W                                                              |

## Electrical rating

|                                                                              |                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CONVENTIONAL THERMAL CURRENT ITH OF AUXILIARY CONTACTS (1-POLE, OPEN)</b> | 6 A                                                                                                                                                                                                                                       |
| <b>MAINS VOLTAGE TOLERANCE</b>                                               | 24 - 240 V AC (at 50/60 Hz)<br>24 – 240 V DC                                                                                                                                                                                              |
| <b>NOMINAL CURRENT</b>                                                       | 3 A                                                                                                                                                                                                                                       |
| <b>RATED BREAKING CAPACITY</b>                                               | 3 A at AC-15 ( $\cos \phi = 0.3$ 220 V)<br>3 A at AC-14 ( $\cos \phi = 0.3$ 440 V)<br>1.1 x I <sub>e</sub> (DC-11 L/R - 40 ms)                                                                                                            |
| <b>RATED MAKING CAPACITY</b>                                                 | 50 A (AC-15 $\cos \phi = 0.3$ 220 V)<br>48 A (AC-14 $\cos \phi = 0.3$ 400 V)<br>1.1 x I <sub>e</sub> (DC-11 L/R - 40 ms)                                                                                                                  |
| <b>RATED OPERATIONAL CURRENT (IE)</b>                                        | 3 A at AC-15, 300 V<br>3 A at AC-14, 380 V 400 V 415 V<br>1.5 A at DC-11, 24 V<br>3 A at AC-15, 380 V 400 V 415 V<br>3 A at AC-14, 440 V<br>1.2 A at DC-11, L/R max. 50 ms<br>3 A at AC-15, 220 V 230 V 240 V<br>3 A at AC-14, 300 V (NC) |
| <b>RATED OPERATIONAL VOLTAGE (UE) AT AC - MAX</b>                            | 440 V                                                                                                                                                                                                                                     |
| <b>SAFE ISOLATION</b>                                                        | 250 V AC, Between coil and auxiliary contacts, According to EN 61140<br>250 V AC, Between auxiliary contacts, According to EN 61140                                                                                                       |
| <b>SHORT-CIRCUIT PROTECTION RATING</b>                                       | Max. 6 A gG/gL, fuse, Without welding, Contacts<br>Max. 6 A gG/gL, Fuse, Short-circuit rating without welding, Contacts                                                                                                                   |

## Features & functions

|                                 |                                                             |
|---------------------------------|-------------------------------------------------------------|
| <b>ELECTRIC CONNECTION TYPE</b> | Screw connection                                            |
| <b>FUNCTIONS</b>                | Fixed timing function<br>Star-delta<br>Star-delta switching |

## Electro magnetic compatibility

|                                                |                                                                                                                                                                           |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AIR DISCHARGE</b>                           | 8 kV                                                                                                                                                                      |
| <b>BURST IMPULSE</b>                           | 2 kV, Supply cable<br>1 kV, Signal cable<br>According to IEC/EN 61000-4-4                                                                                                 |
| <b>CONTACT DISCHARGE</b>                       | 6 kV                                                                                                                                                                      |
| <b>ELECTROMAGNETIC FIELDS</b>                  | 3 V/m at 1.4 - 2 GHz (according to IEC EN 61000-4-3)<br>10 V/m at 80 - 1000 MHz (according to IEC EN 61000-4-3)<br>1 V/m at 2.0 - 2.7 GHz (according to IEC EN 61000-4-3) |
| <b>IMMUNITY TO LINE-CONDUCTED INTERFERENCE</b> | 10 V (according to IEC/EN 61000-4-6)                                                                                                                                      |
| <b>RADIO INTERFERENCE CLASS</b>                | Class B (EN 55011, conducted)<br>Class B (EN 55011, radiated)                                                                                                             |
| <b>SURGE RATING</b>                            | 2 kV, symmetrical, power pulses (Surge), EMC<br>4 kV, asymmetrical, power pulses (Surge), EMC<br>According to IEC/EN 61000-4-5, power pulses (Surge), EMC                 |

## General information

|                             |                                                                            |
|-----------------------------|----------------------------------------------------------------------------|
| <b>DEGREE OF PROTECTION</b> | IP20<br>Terminals: IP20                                                    |
| <b>LIFESPAN, MECHANICAL</b> | 30,000,000 Operations (AC operated)<br>30,000,000 Operations (DC operated) |

|                                                          |                                                                                                                                                                                                                                                           |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MOUNTING POSITION</b>                                 | As required                                                                                                                                                                                                                                               |
| <b>NUMBER OF CONTACTS<br/>(CHANGE-OVER<br/>CONTACTS)</b> | 1                                                                                                                                                                                                                                                         |
| <b>OVERVOLTAGE<br/>CATEGORY</b>                          | III                                                                                                                                                                                                                                                       |
| <b>POLLUTION DEGREE</b>                                  | 2                                                                                                                                                                                                                                                         |
| <b>PRODUCT CATEGORY</b>                                  | ETR4 timing relays                                                                                                                                                                                                                                        |
| <b>RATED IMPULSE<br/>WITHSTAND VOLTAGE<br/>(UIMP)</b>    | 6000 V AC<br>4000 V AC                                                                                                                                                                                                                                    |
| <b>SHOCK RESISTANCE</b>                                  | 4 g, Make contact,<br>Mechanical, according to<br>IEC/EN 60068-2-27, Half-<br>sinusoidal shock 20 ms                                                                                                                                                      |
| <b>SUITABLE FOR</b>                                      | DIN rail (top hat rail)<br>mounting                                                                                                                                                                                                                       |
| <b>TERMINAL CAPACITY</b>                                 | 1 x (20 - 14) AWG, solid or<br>stranded<br>2 x (0.5 - 1.5) mm <sup>2</sup> , flexible<br>with ferrule<br>2 x (0.5 - 1.5) mm <sup>2</sup> , solid<br>1 x (0.5 - 2.5) mm <sup>2</sup> , solid<br>1 x (0.5 - 2.5) mm <sup>2</sup> , flexible<br>with ferrule |
| <b>TIME RANGE - MAX</b>                                  | 60 s                                                                                                                                                                                                                                                      |
| <b>TIME RANGE - MIN</b>                                  | 3 s                                                                                                                                                                                                                                                       |
| <b>TYPE</b>                                              | Timer relay                                                                                                                                                                                                                                               |
| <b>VOLTAGE TYPE</b>                                      | AC/DC                                                                                                                                                                                                                                                     |

## Magnet system

|                                                             |                                                                                                                        |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>COMMAND TIME</b>                                         | 30 ms, DC<br>50 ms, AC                                                                                                 |
| <b>CONTACT CHANGEOVER TIME</b>                              | 50 ms                                                                                                                  |
| <b>DUTY FACTOR</b>                                          | 100 %                                                                                                                  |
| <b>OPERATING FREQUENCY</b>                                  | 4000 Operations/h                                                                                                      |
| <b>PICK-UP VOLTAGE</b>                                      | 0.7 - 1.1 V DC x U <sub>c</sub><br>0.85 - 1.1 V AC x U <sub>c</sub>                                                    |
| <b>POWER CONSUMPTION</b>                                    | 1.8 W at DC (Pick-up power)<br>2 VA at AC (Sealing power)<br>2 VA at AC (Pick-up power)<br>1.8 W at DC (Sealing power) |
| <b>RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MAX</b> | 240 V                                                                                                                  |
| <b>RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MIN</b> | 24 V                                                                                                                   |
| <b>RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 60 HZ - MAX</b> | 240 V                                                                                                                  |
| <b>RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 60 HZ - MIN</b> | 24 V                                                                                                                   |
| <b>RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MAX</b>        | 240 V                                                                                                                  |
| <b>RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MIN</b>        | 24 V                                                                                                                   |
| <b>RECOVERY TIME</b>                                        | 70 ms (after 100 % time delay)                                                                                         |
| <b>REPETITION ACCURACY</b>                                  | ≤ 0.5 % (deviation)                                                                                                    |

## Resources

|                            |                                                                                                                                                                                                                                                                                                 |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BROCHURES                  | <a href="#">EMR6 - EMT6 - ETR4 brochure</a>                                                                                                                                                                                                                                                     |
| CATALOGUES                 | <a href="#">eaton-product-overview-for-machinery-catalogue-ca08103003zen-en-us.pdf</a>                                                                                                                                                                                                          |
| CHARACTERISTIC CURVE       | <a href="#">eaton-timers-diagram-etr4-timing-relay-characteristic-curve-009.eps</a>                                                                                                                                                                                                             |
| DECLARATIONS OF CONFORMITY | <a href="#">eaton-timing-relay-declaration-of-conformity-uk250986en.pdf</a><br><a href="#">eaton-timing-relay-declaration-of-conformity-eu251564en.pdf</a>                                                                                                                                      |
| DRAWINGS                   | <a href="#">eaton-timers-contactor-etr4-timing-relay-dimensions.eps</a><br><a href="#">eaton-electronic-timers-relay-etr4-timing-relay-dimensions.eps</a><br><a href="#">eaton-general-m22-symbol.eps</a><br><a href="#">eaton-electronic-timers-relay-etr4-timing-relay-3d-drawing-003.eps</a> |
| ECAD MODEL                 | <a href="#">eaton-etr4-timing-relay-eplan-031884.edz</a>                                                                                                                                                                                                                                        |
| INSTALLATION INSTRUCTIONS  | <a href="#">eaton-etr4-xttr6-timing-relays-instruction-leaflet-il04910001z.pdf</a>                                                                                                                                                                                                              |
| MCAD MODEL                 | <a href="#">eaton-timer-relays-mcad-drawings-etr4-51.dwg</a><br><a href="#">DA-CS-etr4_51</a>                                                                                                                                                                                                   |
| WIRING DIAGRAMS            | <a href="#">eaton-timers-star-delta-etr4-timing-relay-wiring-diagram.eps</a>                                                                                                                                                                                                                    |

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



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

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