# Specifications

**Photo is representative**

## Eaton 088685

Eaton Moeller® series T0 Step switches, T0, 20 A, flush mounting, 2 contact unit(s), Contacts: 3, 45 °, maintained, Without 0 (Off) position, 1-3, Design number 8230

| General specifications | |
|---|---|
| **PRODUCT NAME** | Eaton Moeller® series T0 Step switch |
| **CATALOG NUMBER** | 088685 |
| **EAN** | 4015080886853 |
| **PRODUCT LENGTH/DEPTH** | 86 mm |
| **PRODUCT HEIGHT** | 48 mm |
| **PRODUCT WIDTH** | 48 mm |
| **PRODUCT WEIGHT** | 0.108 kg |
| **CERTIFICATIONS** | UL Category Control No.: NLRV<br>IEC/EN 60947-3<br>IEC/EN 60204<br>UL File No.: E36332<br>CSA Class No.: 3211-05<br>CSA-C22.2 No. 94<br>UL 60947-4-1<br>CSA-C22.2 No. 60947-4-1-14<br>CE<br>IEC/EN 60947<br>VDE 0660<br>UL<br>CSA File No.: 012528<br>CSA |
| **CATALOG NOTES** | Rated Short-time Withstand Current (Icw) for a time of 1 second |
| **MODEL CODE** | T0-2-8230/E |

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## Features & Functions

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|---|---|
| **FITTED WITH:** | Black thumb grip and front plate |
| **INSCRIPTION** | 1-3 |
| **NUMBER OF POLES** | Single-pole |

## General

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|---|---|
| **DEGREE OF PROTECTION** | NEMA 12<br>IP65<br>NEMA 1 |
| **DEGREE OF PROTECTION (FRONT SIDE)** | IP65<br>NEMA 12 |
| **LIFESPAN, MECHANICAL** | 400,000 Operations |
| **MOUNTING METHOD** | Flush mounting |
| **MOUNTING POSITION** | As required |
| **NUMBER OF CONTACT UNITS** | 2 |
| **OPERATING FREQUENCY** | 1200 Operations/h |
| **OVERVOLTAGE CATEGORY** | III |
| **POLLUTION DEGREE** | 3 |
| **PRODUCT CATEGORY** | Control switches |
| **RATED IMPULSE WITHSTAND VOLTAGE (UIMP)** | 6000 V AC |
| **SAFE ISOLATION** | 440 V AC, Between the contacts, According to EN 61140 |
| **SAFETY PARAMETER (EN ISO 13849-1)** | B10d values as per EN ISO 13849-1, table C.1 |
| **SHOCK RESISTANCE** | 15 g, Mechanical, According to IEC/EN 60068-2-27, Half-sinusoidal shock 20 ms |
| **SUITABLE FOR** | Branch circuits, suitable as motor disconnect, (UL/CSA)<br>Front mounting |
| **SWITCHING ANGLE** | 45 ° |
| **TYPE** | Step switch |

## Climatic environmental conditions

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|---|---|
| **AMBIENT OPERATING TEMPERATURE - MIN** | -25 °C |
| **AMBIENT OPERATING TEMPERATURE - MAX** | 50 °C |
| **AMBIENT OPERATING TEMPERATURE (ENCLOSED) - MIN** | -25 °C |
| **AMBIENT OPERATING TEMPERATURE (ENCLOSED) - MAX** | 40 °C |
| **CLIMATIC PROOFING** | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30 |

## Terminal capacities

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|---|---|
| **TERMINAL CAPACITY (FLEXIBLE WITH FERRULE)** | 2 x (0.75 - 2.5) $mm^2$, ferrules to DIN 46228<br>1 x (0.75 - 2.5) $mm^2$, ferrules to DIN 46228 |
| **TERMINAL CAPACITY (SOLID/FLEXIBLE WITH FERRULE AWG)** | 18 - 14 |
| **TERMINAL CAPACITY (SOLID/STRANDED)** | 2 x (1 - 2.5) $mm^2$<br>1 x (1 - 2.5) $mm^2$ |
| **SCREW SIZE** | M3.5, Terminal screw |
| **TIGHTENING TORQUE** | 8.8 lb-in, Screw terminals<br>1 Nm, Screw terminals |

## Electrical rating

| | |
|---|---|
| **RATED BREAKING CAPACITY AT 220/230 V (COS PHI TO IEC 60947-3)** | 100 A |
| **RATED BREAKING CAPACITY AT 400/415 V (COS PHI TO IEC 60947-3)** | 110 A |
| **RATED BREAKING CAPACITY AT 500 V (COS PHI TO IEC 60947-3)** | 80 A |
| **RATED BREAKING CAPACITY AT 660/690 V (COS PHI TO IEC 60947-3)** | 60 A |
| **RATED OPERATING VOLTAGE (UE) AT AC - MAX** | 690 V |
| **RATED OPERATIONAL CURRENT (IE) AT AC-3, 220 V, 230 V, 240 V** | 11.5 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-3, 380 V, 400 V, 415 V** | 11.5 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-3, 500 V** | 9 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-3, 660 V, 690 V** | 4.9 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-21, 440 V** | 20 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-23A, 230 V** | 13.3 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-23A, 400 V, 415 V** | 13.3 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-23A, 500 V** | 13.3 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-23A, 690 V** | 7.6 A |
| **RATED OPERATIONAL CURRENT (IE) AT DC-1, LOAD-BREAK SWITCHES L/R = 1 MS** | 10 A |
| **RATED OPERATIONAL CURRENT (IE) AT DC-13, CONTROL SWITCHES L/R** | 10 A |

## Short-circuit rating

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|---|---|
| **RATED CONDITIONAL SHORT-CIRCUIT CURRENT (IQ)** | 6 kA |
| **RATED SHORT-TIME WITHSTAND CURRENT (ICW)** | 320 A, Contacts, 1 second |
| **SHORT-CIRCUIT CURRENT RATING (BASIC RATING)** | 5 kA, SCCR (UL/CSA)<br>50A, max. Fuse, SCCR (UL/CSA) |
| **SHORT-CIRCUIT CURRENT RATING (HIGH FAULT)** | 10 kA, SCCR (UL/CSA)<br>20 A, Class J, max. Fuse, SCCR (UL/CSA) |
| **SHORT-CIRCUIT PROTECTION RATING** | 20 A gG/gL, Fuse, Contacts |

| = 50 MS | |
|---|---|
| **RATED OPERATIONAL CURRENT (IE) AT DC-21, 240 V** | 1 A |
| **RATED OPERATIONAL CURRENT (IE) AT DC-23A, 24 V** | 10 A |
| **RATED OPERATIONAL CURRENT (IE) AT DC-23A, 48 V** | 10 A |
| **RATED OPERATIONAL CURRENT (IE) AT DC-23A, 60 V** | 10 A |
| **RATED OPERATIONAL CURRENT (IE) AT DC-23A, 120 V** | 5 A |
| **RATED OPERATIONAL CURRENT (IE) AT DC-23A, 240 V** | 5 A |
| **RATED OPERATIONAL CURRENT (IE) STAR-DELTA AT AC-3, 230 V** | 20 A |
| **RATED OPERATIONAL CURRENT (IE) STAR-DELTA AT AC-3, 400 V** | 20 A |
| **RATED OPERATIONAL CURRENT (IE) STAR-DELTA AT AC-3, 500 V** | 15.6 A |
| **RATED OPERATIONAL CURRENT (IE) STAR-DELTA AT AC-3, 690 V** | 8.5 A |
| **RATED OPERATIONAL POWER AT AC-3, 415 V, 50 HZ** | 5.5 kW |
| **RATED OPERATIONAL POWER AT AC-3, 690 V, 50 HZ** | 4 kW |
| **RATED OPERATIONAL POWER AT AC-23A, 220/230 V, 50 HZ** | 3 kW |
| **RATED OPERATIONAL POWER AT AC-23A, 400 V, 50 HZ** | 5.5 kW |
| **RATED OPERATIONAL POWER AT AC-23A, 500 V, 50 HZ** | 7.5 kW |
| **RATED OPERATIONAL POWER AT AC-23A, 690 V, 50 HZ** | 5.5 kW |
| **RATED OPERATIONAL** | 5.5 kW |

| | |
|---|---|
| **POWER STAR-DELTA AT 220/230 V, 50 HZ** | |
| **RATED OPERATIONAL POWER STAR-DELTA AT 380/400 V, 50 HZ** | 7.5 kW |
| **RATED OPERATIONAL POWER STAR-DELTA AT 500 V, 50 HZ** | 7.5 kW |
| **RATED OPERATIONAL POWER STAR-DELTA AT 690 V, 50 HZ** | 5.5 kW |
| **RATED UNINTERRUPTED CURRENT (IU)** | 20 A |
| **UNINTERRUPTED CURRENT** | Rated uninterrupted current Iu is specified for max. cross-section. |

## Switching capacity

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| **LOAD RATING** | 1.3 x $I_e$ (with intermittent operation class 12, 60 % duty factor)<br>2 x $I_e$ (with intermittent operation class 12, 25 % duty factor)<br>1.6 x $I_e$ (with intermittent operation class 12, 40 % duty factor) |
| **NUMBER OF CONTACTS IN SERIES AT DC-21A, 240 V** | 1 |
| **NUMBER OF CONTACTS IN SERIES AT DC-23A, 24 V** | 1 |
| **NUMBER OF CONTACTS IN SERIES AT DC-23A, 48 V** | 2 |
| **NUMBER OF CONTACTS IN SERIES AT DC-23A, 60 V** | 3 |
| **NUMBER OF CONTACTS IN SERIES AT DC-23A, 120 V** | 3 |
| **NUMBER OF CONTACTS IN SERIES AT DC-23A, 240 V** | 5 |
| **SWITCHING CAPACITY (MAIN CONTACTS, GENERAL USE)** | 16 A, Rated uninterrupted current max. (UL/CSA) |
| **SWITCHING CAPACITY (AUXILIARY CONTACTS, GENERAL USE)** | 10A, IU, (UL/CSA) |
| **SWITCHING CAPACITY (AUXILIARY CONTACTS, PILOT DUTY)** | A600 (UL/CSA)<br>P300 (UL/CSA) |
| **RATED MAKING CAPACITY UP TO 690 V (COS PHI TO IEC/EN 60947-3)** | 130 A |
| **VOLTAGE PER CONTACT PAIR IN SERIES** | 60 V |

## Motor rating

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|---|---|
| **ASSIGNED MOTOR POWER AT 115/120 V, 60 HZ, 1-PHASE** | 0.5 HP |
| **ASSIGNED MOTOR POWER AT 200/208 V, 60 HZ, 1-PHASE** | 1 HP |
| **ASSIGNED MOTOR POWER AT 200/208 V, 60 HZ, 3-PHASE** | 3 HP |
| **ASSIGNED MOTOR POWER AT 230/240 V, 60 HZ, 1-PHASE** | 1.5 HP |
| **ASSIGNED MOTOR POWER AT 230/240 V, 60 HZ, 3-PHASE** | 3 HP |
| **ASSIGNED MOTOR POWER AT 460/480 V, 60 HZ, 3-PHASE** | 7.5 HP |
| **ASSIGNED MOTOR POWER AT 575/600 V, 60 HZ, 3-PHASE** | 7.5 HP |

## Contacts

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| **CONTROL CIRCUIT RELIABILITY** | 1 failure per 100,000 switching operations statistically determined, at 24 V DC, 10 mA) |
| **NUMBER OF CONTACTS** | 3 |

## Actuator

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| **ACTUATOR FUNCTION** | Maintained<br>Without 0 (Off) position |
| **ACTUATOR TYPE** | Toggle |
| **NUMBER OF STEPS** | 3 (45°) |
| **NUMBER OF SWITCH POSITIONS** | 3 |

## Design verification

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|---|---|
| **EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID** | 0 W |
| **HEAT DISSIPATION CAPACITY PDISS** | 0 W |
| **HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID** | 0.6 W |
| **RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)** | 20 A |
| **STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS** | 0 W |
| **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** | UV resistance only in connection with protective shield. |
| **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 AGAINST ELECTRIC SHOCK** | Does not apply, since the entire switchgear needs to be evaluated. |

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| **10.6 INCORPORATION OF SWITCHING DEVICES AND COMPONENTS** | Does not apply, since the entire switchgear needs to be evaluated. |
| **10.7 INTERNAL ELECTRICAL CIRCUITS AND CONNECTIONS** | Is the panel builder's responsibility. |
| **10.8 CONNECTIONS FOR EXTERNAL CONDUCTORS** | Is the panel builder's responsibility. |
| **10.9.2 POWER-FREQUENCY ELECTRIC STRENGTH** | Is the panel builder's responsibility. |
| **10.9.3 IMPULSE WITHSTAND VOLTAGE** | Is the panel builder's responsibility. |
| **10.9.4 TESTING OF ENCLOSURES MADE OF INSULATING MATERIAL** | Is the panel builder's responsibility. |
| **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. |

## Resources

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| **BROCHURES** | Brochure - T Rotary Cam switch and P Switch-disconnector |
| **CATALOGUES** | P Switch-disconnectors and T Rotary cam switches catalogue CA042001EN |
| **DECLARATIONS OF CONFORMITY** | DA-DC-00004895.pdf DA-DC-00004927.pdf |
| **DRAWINGS** | eaton-rotary-switches-mounting-t0-step-switch-dimensions-025.eps |

| | |
|---|---|
| | eaton-general-rotary-switch-t0-step-switch-symbol-002.eps<br>eaton-rotary-switches-front-plate-t0-step-switch-symbol-013.eps<br>eaton-rotary-switches-mounting-t0-changeover-switch-3d-drawing-002.eps |
| **ECAD MODEL** | ETN.088685.edz |
| **INSTALLATION INSTRUCTIONS** | IL03801020Z |
| **INSTALLATION VIDEOS** | Eaton's P Switch-disconnectors used in a factory |
| **MCAD MODEL** | DA-CS-t0_2_e DA-CD-t0_2_e |
| **PRODUCT NOTIFICATIONS** | MZ008005ZU_Orderform_Customized_Switch.pdf<br>MZ008006ZU_Orderform_Customized_Switch.pdf |
| **WIRING DIAGRAMS** | eaton-rotary-switches-switch-t0-step-switch-wiring-diagram-007.eps |

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

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