

# Specifications

## Eaton 098178

Eaton Moeller® series T0 Step switches, T0, 20 A, service distribution board mounting, 5 contact unit(s), Contacts: 9, 45 °, maintained, Without 0 (Off) position, 1-3, Design number 8270

### General specifications

<b>PRODUCT NAME</b>	Eaton Moeller® series T0 Step switch
<b>CATALOG NUMBER</b>	098178
<b>EAN</b>	4015080981787
<b>PRODUCT LENGTH/DEPTH</b>	120 mm
<b>PRODUCT HEIGHT</b>	55 mm
<b>PRODUCT WIDTH</b>	54 mm
<b>PRODUCT WEIGHT</b>	0.205 kg
<b>CERTIFICATIONS</b>	CSA-C22.2 No. 60947-4-1-14 VDE 0660 IEC/EN 60947-3 UL 60947-4-1 UL File No.: E36332 CE CSA File No.: 012528 UL UL Category Control No.: NLRV CSA CSA-C22.2 No. 94 IEC/EN 60947 CSA Class No.: 3211-05 IEC/EN 60204
<b>CATALOG NOTES</b>	Rated Short-time Withstand Current (Icw) for a time of 1 second
<b>MODEL CODE</b>	T0-5-8270/IVS

## Features & Functions

<b>FITTED WITH:</b>	Black thumb grip and front plate
<b>INSCRIPTION</b>	1-3
<b>NUMBER OF POLES</b>	Three-pole

## General

<b>DEGREE OF PROTECTION</b>	IP30
<b>DEGREE OF PROTECTION (FRONT SIDE)</b>	IP30 NEMA 2
<b>LIFESPAN, MECHANICAL</b>	400,000 Operations
<b>MOUNTING METHOD</b>	Service distribution board mounting
<b>MOUNTING POSITION</b>	As required
<b>NUMBER OF CONTACT UNITS</b>	5
<b>OPERATING FREQUENCY</b>	1200 Operations/h
<b>OVERVOLTAGE CATEGORY</b>	III
<b>POLLUTION DEGREE</b>	3
<b>PRODUCT CATEGORY</b>	Control switches
<b>RATED IMPULSE WITHSTAND VOLTAGE (UIMP)</b>	6000 V AC
<b>SAFE ISOLATION</b>	440 V AC, Between the contacts, According to EN 61140
<b>SAFETY PARAMETER (EN ISO 13849-1)</b>	B10d values as per EN ISO 13849-1, table C.1
<b>SHOCK RESISTANCE</b>	15 g, Mechanical, According to IEC/EN 60068-2-27, Half-sinusoidal shock 20 ms
<b>SUITABLE FOR</b>	Distribution board installation Branch circuits, suitable as motor disconnect, (UL/CSA) Ground mounting Front mounting
<b>SWITCHING ANGLE</b>	45 °
<b>TYPE</b>	Step switch

## Climatic environmental conditions

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

## Terminal capacities

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

## Electrical rating

### RATED BREAKING

**CAPACITY AT 220/230 V** 100 A  
(COS PHI TO IEC 60947-3)

### RATED BREAKING

**CAPACITY AT 400/415 V** 110 A  
(COS PHI TO IEC 60947-3)

### RATED BREAKING

**CAPACITY AT 500 V (COS PHI TO IEC 60947-3)** 80 A

### RATED BREAKING

**CAPACITY AT 660/690 V** 60 A  
(COS PHI TO IEC 60947-3)

### 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

### 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)  
50A, max. Fuse, SCCR (UL/CSA)

**SHORT-CIRCUIT CURRENT RATING (HIGH FAULT)** 20 A, Class J, max. Fuse,  
SCCR (UL/CSA)  
10 kA, SCCR (UL/CSA)

**SHORT-CIRCUIT PROTECTION RATING** 20 A gG/gL, Fuse, Contacts

**= 50 MS**

**RATED OPERATIONAL**

**CURRENT (IE) AT DC-21, 1 A  
240 V**

**RATED OPERATIONAL**

**CURRENT (IE) AT DC-23A, 10 A  
24 V**

**RATED OPERATIONAL**

**CURRENT (IE) AT DC-23A, 10 A  
48 V**

**RATED OPERATIONAL**

**CURRENT (IE) AT DC-23A, 10 A  
60 V**

**RATED OPERATIONAL**

**CURRENT (IE) AT DC-23A, 5 A  
120 V**

**RATED OPERATIONAL**

**CURRENT (IE) AT DC-23A, 5 A  
240 V**

**RATED OPERATIONAL**

**CURRENT (IE) STAR-  
DELTA AT AC-3, 230 V**

**RATED OPERATIONAL**

**CURRENT (IE) STAR-  
DELTA AT AC-3, 400 V**

**RATED OPERATIONAL**

**CURRENT (IE) STAR-  
DELTA AT AC-3, 500 V**

**RATED OPERATIONAL**

**CURRENT (IE) STAR-  
DELTA AT AC-3, 690 V**

**RATED OPERATIONAL**

**POWER AT AC-3, 415 V, 50  
HZ**

**RATED OPERATIONAL**

**POWER AT AC-3, 690 V, 50  
HZ**

**RATED OPERATIONAL**

**POWER AT AC-23A,  
220/230 V, 50 HZ**

**RATED OPERATIONAL**

**POWER AT AC-23A, 400 V, 5.5 kW  
50 HZ**

**RATED OPERATIONAL**

**POWER AT AC-23A, 500 V, 7.5 kW  
50 HZ**

**RATED OPERATIONAL**

**POWER AT AC-23A, 690 V, 5.5 kW  
50 HZ**

**RATED OPERATIONAL**

**5.5 kW**

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**POWER STAR-DELTA AT**

**220/230 V, 50 HZ**

**RATED OPERATIONAL**

**POWER STAR-DELTA AT 7.5 kW**  
**380/400 V, 50 HZ**

**RATED OPERATIONAL**

**POWER STAR-DELTA AT 7.5 kW**  
**500 V, 50 HZ**

**RATED OPERATIONAL**

**POWER STAR-DELTA AT 5.5 kW**  
**690 V, 50 HZ**

**RATED UNINTERRUPTED**

**CURRENT (IU) 20 A**

**UNINTERRUPTED**  
**CURRENT**

Rated uninterrupted  
current lu is specified for  
max. cross-section.

## Switching capacity

LOAD RATING	2 x $I_e$ (with intermittent operation class 12, 25 % duty factor) 1.6 x $I_e$ (with intermittent operation class 12, 40 % duty factor) 1.3 x $I_e$ (with intermittent operation class 12, 60 % 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) 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

## Contacts

CONTROL CIRCUIT RELIABILITY	1 failure per 100,000 switching operations statistically determined, at 24 V DC, 10 mA)
NUMBER OF CONTACTS	9

## Motor rating

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

## Actuator

ACTUATOR FUNCTION	Without 0 (Off) position Maintained
ACTUATOR TYPE	Toggle
NUMBER OF STEPS	3 (45°)
NUMBER OF SWITCH POSITIONS	3

## Design verification

### EQUIPMENT HEAT

DISSIPATION, CURRENT- 0 W

### DEPENDENT PVID

HEAT DISSIPATION 0 W  
CAPACITY PDISS

HEAT DISSIPATION PER  
POLE, CURRENT- 0.6 W  
DEPENDENT PVID

RATED OPERATIONAL  
CURRENT FOR SPECIFIED 20 A  
HEAT DISSIPATION (IN)

STATIC HEAT  
DISSIPATION, NON- 0 W  
CURRENT-DEPENDENT  
PVS

**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  
AGAINST ELECTRIC  
SHOCK** 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.
<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** [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-006.eps](#)

<a href="#">eaton-rotary-switches-mounting-t0-step-switch-dimensions.eps</a>
<a href="#">eaton-rotary-switches-mounting-t0-changeover-switch-3d-drawing.eps</a>
<a href="#">eaton-rotary-switches-front-plate-t0-step-switch-symbol-013.eps</a>
<a href="#">eaton-general-rotary-switch-t0-step-switch-symbol-005.eps</a>
<b>ECAD MODEL</b> <a href="#">ETN.098178.edz</a>
<b>INSTALLATION INSTRUCTIONS</b> <a href="#">IL03801006Z</a>
<b>INSTALLATION VIDEOS</b> <a href="#">Eaton's P Switch-disconnectors used in a factory</a>
<b>MCAD MODEL</b> <a href="#">DA-CS-t0_5_ivs DA-CD-t0_5_ivs</a>
<b>PRODUCT NOTIFICATIONS</b> <a href="#">MZ008005ZU_Orderform_Customized_Switch.pdf</a> <a href="#">MZ008006ZU_Orderform_Customized_Switch.pdf</a>
<b>WIRING DIAGRAMS</b> <a href="#">eaton-rotary-switches-switch-t0-step-switch-wiring-diagram-011.eps</a>

**PROJECT NAME:**

**PROJECT NUMBER:**

**PREPARED BY:**

**DATE:**



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