

# Specifications



## Eaton 178131

Eaton Moeller® series LS Position switch, Rounded plunger, Basic device, expandable, 1 N/O, 1 NC (late-break), Cage Clamp, Yellow, Insulated material, -25 - +70 °C, with M12 connector, version A

### General specifications

|                      |                                          |
|----------------------|------------------------------------------|
| PRODUCT NAME         | Eaton Moeller® series LS Position switch |
| CATALOG NUMBER       | 178131                                   |
| MODEL CODE           | LS-11DA-M12A                             |
| EAN                  | 4015081734542                            |
| PRODUCT LENGTH/DEPTH | 33.5 mm                                  |
| PRODUCT HEIGHT       | 91.5 mm                                  |
| PRODUCT WIDTH        | 31 mm                                    |
| PRODUCT WEIGHT       | 0.058 kg                                 |
| CERTIFICATIONS       | IEC/EN 60947                             |



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## Features & Functions

|                                 |                                                  |
|---------------------------------|--------------------------------------------------|
| <b>ELECTRIC CONNECTION TYPE</b> | Connector M12                                    |
| <b>ENCLOSURE COLOR</b>          | Yellow Cover                                     |
| <b>ENCLOSURE MATERIAL</b>       | Plastic<br>Insulated material                    |
| <b>FEATURES</b>                 | Positive opening<br>Expandable<br>Forced opening |
| <b>SWITCH FUNCTION TYPE</b>     | Slow-action switch                               |

## Ambient conditions, mechanical

|                               |                                                                        |
|-------------------------------|------------------------------------------------------------------------|
| <b>MOUNTING POSITION</b>      | As required                                                            |
| <b>SHOCK RESISTANCE</b>       | 25 g, Standard-action contact, Mechanical, Half-sinusoidal shock 20 ms |
| <b>TEMPERATURE RESISTANCE</b> | 100 °C, Contact temperature of roller head                             |

## Terminal capacities

|                                                  |                                 |
|--------------------------------------------------|---------------------------------|
| <b>TERMINAL CAPACITY (FLEXIBLE WITH FERRULE)</b> | 1 x (0.5 - 1.5) mm <sup>2</sup> |
| <b>TERMINAL CAPACITY (SOLID)</b>                 | 1 x (0.5 - 2.5) mm <sup>2</sup> |

## General

|                                               |                                                                                                    |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>ACCESSORIES</b>                            | M12 connector included.                                                                            |
| <b>CONNECTION TYPE</b>                        | Cage Clamp                                                                                         |
| <b>DEGREE OF PROTECTION</b>                   | IP66<br>NEMA Other                                                                                 |
| <b>OPERATING FREQUENCY</b>                    | 6000 Operations/h                                                                                  |
| <b>OVERVOLTAGE CATEGORY</b>                   | III                                                                                                |
| <b>POLLUTION DEGREE</b>                       | 3                                                                                                  |
| <b>PRODUCT CATEGORY</b>                       | Rounded plunger                                                                                    |
| <b>RATED IMPULSE WITHSTAND VOLTAGE (UIMP)</b> | 2500 V AC                                                                                          |
| <b>REPETITION ACCURACY</b>                    | 0.15 mm<br>(Contacts/switching capacity)                                                           |
| <b>SUITABLE FOR</b>                           | Safety functions                                                                                   |
| <b>TYPE</b>                                   | <ul style="list-style-type: none"><li>• Position switch</li><li>• Safety position switch</li></ul> |

## Climatic environmental conditions

|                                            |                                                                                |
|--------------------------------------------|--------------------------------------------------------------------------------|
| <b>AMBIENT OPERATING TEMPERATURE - MIN</b> | -25 °C                                                                         |
| <b>AMBIENT OPERATING TEMPERATURE - MAX</b> | 70 °C                                                                          |
| <b>CLIMATIC PROOFING</b>                   | Damp heat, cyclic, to IEC 60068-2-30<br>Damp heat, constant, to IEC 60068-2-78 |

## Electrical rating

|                                                                     |       |
|---------------------------------------------------------------------|-------|
| <b>RATED CONDITIONAL SHORT-CIRCUIT CURRENT (IQ)</b>                 | 1 kA  |
| <b>RATED INSULATION VOLTAGE (UI)</b>                                | 250 V |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-15, 115 V</b>               | 4 A   |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-15, 220 V, 230 V, 240 V</b> | 6 A   |

|                                                                     |                                |
|---------------------------------------------------------------------|--------------------------------|
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-15, 24 V</b>                | 6 A                            |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-15, 380 V, 400 V, 415 V</b> | 4 A                            |
| <b>RATED OPERATIONAL CURRENT (IE) AT DC-13, 110 V</b>               | 0.8 A                          |
| <b>RATED OPERATIONAL CURRENT (IE) AT DC-13, 125 V</b>               | 0.6 A                          |
| <b>RATED OPERATIONAL CURRENT (IE) AT DC-13, 220 V, 230 V</b>        | 0.3 A                          |
| <b>RATED OPERATIONAL CURRENT (IE) AT DC-13, 24 V</b>                | 3 A                            |
| <b>SHORT-CIRCUIT PROTECTION RATING</b>                              | Max. 4 A gG/gL, Fuse, Contacts |
| <b>SUPPLY FREQUENCY</b>                                             | Max. 400 Hz, Contacts          |

## Actuator

|                                          |                                                                                                           |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>ACTUATING TORQUE OF ROTARY DRIVES</b> | 0.2 Nm                                                                                                    |
| <b>ACTUATOR TYPE</b>                     | Plunger                                                                                                   |
| <b>OPERATING SPEED</b>                   | Max. 1/0.5 m/s (with DIN cam, mechanical actuation)<br>For angle of actuation $\alpha = 0^\circ/30^\circ$ |

## Safety

|                                           |      |
|-------------------------------------------|------|
| <b>EXPLOSION SAFETY CATEGORY FOR GAS</b>  | None |
| <b>EXPLOSION SAFETY CATEGORY FOR DUST</b> | None |

## Contacts

|                                                      |                                                                                                                                                                                      |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CONTROL CIRCUIT RELIABILITY</b>                   | 1 failure per 10,000,000 switching operations (Statistically determined, at 24 V DC/5 mA)<br>1 failure per 5,000,000 switching operations (statistically determined, at 5 V DC/1 mA) |
| <b>NUMBER OF CONTACTS (CHANGE-OVER CONTACTS)</b>     | 0                                                                                                                                                                                    |
| <b>NUMBER OF CONTACTS (NORMALLY CLOSED CONTACTS)</b> | 1                                                                                                                                                                                    |
| <b>NUMBER OF CONTACTS (NORMALLY OPEN CONTACTS)</b>   | 1                                                                                                                                                                                    |

## Design verification

|                                                           |     |
|-----------------------------------------------------------|-----|
| <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>                                | 0.17 W                                                             |
| <b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b>                    | 6 A                                                                |
| <b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS</b>                               | 0 W                                                                |
| <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 AGAINST ELECTRIC SHOCK</b>                                           | 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</b>                                                             | Is the panel builder's                                             |

|                                                                 |                                                                                                                                  |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>EXTERNAL CONDUCTORS</b>                                      | 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

|                            |                                                                                                          |
|----------------------------|----------------------------------------------------------------------------------------------------------|
| CATALOGUES                 | <a href="#">eaton-pushbuttons-signal-towers-sensors-assortment-overview-catalog-ca047003en-en-us.pdf</a> |
|                            | <a href="#">eaton-product-overview-for-machinery-catalogue-ca08103003zen-en-us.pdf</a>                   |
| CONTROL TRAVEL DIAGRAM     | <a href="#">eaton-position-switches-diagram-ls-contact-travel-diagram.eps</a>                            |
| DECLARATIONS OF CONFORMITY | <a href="#">eaton-position-switch-declaration-of-conformity-uk251032en.pdf</a>                           |
|                            | <a href="#">DA-DC-00004160.pdf</a>                                                                       |
|                            | <a href="#">DA-DC-00004133.pdf</a>                                                                       |
|                            | <a href="#">eaton-position-switch-declaration-of-conformity-eu250549en.pdf</a>                           |
| DRAWINGS                   | <a href="#">eaton-position-switches-ls-dimensions-004.eps</a>                                            |
|                            | <a href="#">eaton-position-switches-ls-3d-drawing-002.eps</a>                                            |
|                            | <a href="#">eaton-operating-button-symbol-008.eps</a>                                                    |
| ECAD MODEL                 | <a href="#">ETN.178131.edz</a>                                                                           |
| INSTALLATION INSTRUCTIONS  | <a href="#">IL053001ZU</a>                                                                               |
| MCAD MODEL                 | <a href="#">DA-CS-ls_4a</a> <a href="#">DA-CD-ls_4a</a>                                                  |
| SALES NOTES                | <a href="#">eaton-safety-switches-rs-titan-flyer-fl053001en-en-us.pdf</a>                                |
| WIRING DIAGRAMS            | <a href="#">eaton-position-switches-contact-ls-wiring-diagram-004.eps</a>                                |

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



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