

# Specifications



## Eaton 169000

Eaton S811 Soft starter, 500 A, 200 - 600 V AC, Us= 24 V DC, with control unit and pump algorithm, Frame size V

### General specifications

|                     |                         |
|---------------------|-------------------------|
| <b>PRODUCT NAME</b> | Eaton S811 Soft starter |
|---------------------|-------------------------|

|                       |        |
|-----------------------|--------|
| <b>CATALOG NUMBER</b> | 169000 |
|-----------------------|--------|

|                   |             |
|-------------------|-------------|
| <b>MODEL CODE</b> | S811+V50P3S |
|-------------------|-------------|

|            |               |
|------------|---------------|
| <b>EAN</b> | 4015081654949 |
|------------|---------------|

|                             |          |
|-----------------------------|----------|
| <b>PRODUCT LENGTH/DEPTH</b> | 187.8 mm |
|-----------------------------|----------|

|                       |          |
|-----------------------|----------|
| <b>PRODUCT HEIGHT</b> | 420.8 mm |
|-----------------------|----------|

|                      |          |
|----------------------|----------|
| <b>PRODUCT WIDTH</b> | 280.6 mm |
|----------------------|----------|

|                       |         |
|-----------------------|---------|
| <b>PRODUCT WEIGHT</b> | 41.4 kg |
|-----------------------|---------|

|                       |                                                                                                                                                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CERTIFICATIONS</b> | GB14048<br>CSA<br>CSA Class No.: 3211-06<br>UL<br>C-Tick<br>CSA22.2-14-1995<br>CCC<br>UL Category Control No.: NMFT<br>UL File No.: E202571<br>CSA File No.: LR 353<br>UL 508<br>CE<br>CSA-C22.2 No. 14<br>IEC/EN 60947-4-2 |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



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## Climatic environmental conditions

|                                                |                                                                                     |
|------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>ALTITUDE</b>                                | Above 2000 m with 0.5 %<br>derating per 100 m<br>Max. 2000 m                        |
| <b>AMBIENT OPERATING<br/>TEMPERATURE - MAX</b> | 50 °C                                                                               |
| <b>AMBIENT STORAGE<br/>TEMPERATURE - MAX</b>   | 70 °C                                                                               |
| <b>AMBIENT OPERATING<br/>TEMPERATURE - MIN</b> | -30 °C                                                                              |
| <b>AMBIENT STORAGE<br/>TEMPERATURE - MIN</b>   | -50 °C                                                                              |
| <b>CLIMATIC PROOFING</b>                       | Damp heat, constant, to<br>IEC 60068-2-3<br>Damp heat, cyclic, to IEC<br>60068-2-30 |

## Control circuit

|                                                              |                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CURRENT<br/>CONSUMPTION</b>                               | 100 mA, Control circuit,<br>Digital inputs, External 24<br>V (no-load)<br>150 mA, Control circuit,<br>Digital inputs, External 24<br>V<br>1400 mA, Control circuit,<br>Regulator supply<br>10 A/150 ms, Control<br>circuit, Regulator supply at<br>peak performance (close<br>bypass) at 24 V DC |
| <b>DROP-OUT TIME</b>                                         | 100 ms, DC operated                                                                                                                                                                                                                                                                              |
| <b>DROP-OUT VOLTAGE</b>                                      | 0 - 3 V, DC operated                                                                                                                                                                                                                                                                             |
| <b>PICK-UP TIME</b>                                          | 100 ms at DC                                                                                                                                                                                                                                                                                     |
| <b>PICK-UP VOLTAGE</b>                                       | 21.6 - 26.4 V DC                                                                                                                                                                                                                                                                                 |
| <b>RATED CONTROL SUPPLY<br/>VOLTAGE (US) AT DC -<br/>MAX</b> | 24 V                                                                                                                                                                                                                                                                                             |
| <b>RATED CONTROL SUPPLY<br/>VOLTAGE (US) AT DC -<br/>MIN</b> | 24 V                                                                                                                                                                                                                                                                                             |

## 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                                                                                                        |

## Features & functions

|                     |                                                                                                                                                                                                                                                                                                                         |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FAULT MEMORY</b> | 10 Faults                                                                                                                                                                                                                                                                                                               |
| <b>FITTED WITH:</b> | Motor overload protection<br>Internal bypass contacts<br>Internal bypass<br>Display                                                                                                                                                                                                                                     |
| <b>FUNCTIONS</b>    | Current limitation<br>Soft start function<br>Underload monitoring<br>Single direction<br>Overload monitoring<br>Suppression of DC components for motors<br>Potential isolation between power and control sections<br>Min. ramp time 1 s - fast switching (semiconductor contactor)<br>Suppression of closing transients |
| <b>INTERFACES</b>   | Modbus RTU (built-in)                                                                                                                                                                                                                                                                                                   |

|                                                                      |                                                                    |
|----------------------------------------------------------------------|--------------------------------------------------------------------|
| <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>            | 25 W                                                               |
| <b>HEAT DISSIPATION CAPACITY PDISS</b>                               | 0 W                                                                |
| <b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID</b>             | 0 W                                                                |
| <b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b> | 500 A                                                              |
| <b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS</b>            | 25 W                                                               |

## General information

|                                               |                                                                                                                                    |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>CLASS</b>                                  | Adjustable                                                                                                                         |
| <b>CONNECTION TO SMARTWIRE-DT</b>             | No                                                                                                                                 |
| <b>DEGREE OF PROTECTION</b>                   | IP00<br>NEMA Other                                                                                                                 |
| <b>FRAME SIZE</b>                             | V                                                                                                                                  |
| <b>MAINS VOLTAGE - MAX</b>                    | 600 V                                                                                                                              |
| <b>MAINS VOLTAGE - MIN</b>                    | 200 V                                                                                                                              |
| <b>MOUNTING POSITION</b>                      | As required                                                                                                                        |
| <b>OVERVOLTAGE CATEGORY</b>                   | II                                                                                                                                 |
| <b>POLLUTION DEGREE</b>                       | 3                                                                                                                                  |
| <b>RADIO INTERFERENCE CLASS</b>               | Class A (EN 55011)                                                                                                                 |
| <b>RATED IMPULSE WITHSTAND VOLTAGE (UIMP)</b> | 4000 V                                                                                                                             |
| <b>RATED INSULATION VOLTAGE (UI)</b>          | 660 V                                                                                                                              |
| <b>SHOCK RESISTANCE</b>                       | 15 g, Mechanical                                                                                                                   |
| <b>STARTUP CLASS</b>                          | CLASS 20 (heavy starting duty $3 \times I_e$ for 45 s)<br>CLASS 10 (star-delta replacement)<br>CLASS 30 ( $6 \times I_e$ for 30 s) |
| <b>SUITABLE FOR</b>                           | Branch circuits, not as BCPD, (UL/CSA)                                                                                             |
| <b>TYPE</b>                                   | Soft starter for three-phase loads, with control unit and pump algorithm                                                           |
| <b>VOLTAGE TYPE</b>                           | DC                                                                                                                                 |

## Input/Output

|                                                |                                                                  |
|------------------------------------------------|------------------------------------------------------------------|
| <b>INPUT CURRENT</b>                           | 4 - 20 mA (Analog inputs)                                        |
| <b>NUMBER OF INPUTS</b>                        | 1 (current input)                                                |
| <b>NUMBER OF OUTPUTS</b>                       | 2 Relay Outputs (programmable)                                   |
| <b>OUTPUT VOLTAGE</b>                          | 120 V AC/DC (relay outputs)                                      |
| <b>PROTECTION</b>                              | Finger and back-of-hand proof, Protection against direct contact |
| <b>RATED CONTROL VOLTAGE (UC)</b>              | 24 V DC<br>24 V DC (-10 %/+10 %)                                 |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-11</b> | 3 A                                                              |

## Main conducting paths

|                                                          |                                                          |
|----------------------------------------------------------|----------------------------------------------------------|
| <b>OVERLOAD CYCLE</b>                                    | AC-53a: 4.0 - 32: 99 - 3                                 |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-53</b>           | 500 A                                                    |
| <b>RATED OPERATIONAL CURRENT (IE) AT AC-53, IN-DELTA</b> | 865 A                                                    |
| <b>RATED OPERATIONAL VOLTAGE (UE) - MAX</b>              | 600 V                                                    |
| <b>RATED OPERATIONAL VOLTAGE (UE) - MIN</b>              | 200 V                                                    |
| <b>SHORT-CIRCUIT PROTECTION RATING</b>                   | NZMN3-S500, Type "1" coordination, Main conducting paths |
| <b>SUPPLY FREQUENCY</b>                                  | 50/60 Hz, fLN, Main circuit                              |
| <b>VOLTAGE RATING - MAX</b>                              | 600 V                                                    |

## Motor rating

|                                                             |        |
|-------------------------------------------------------------|--------|
| <b>ASSIGNED MOTOR POWER AT 200/208 V, 60 HZ, 3-PHASE</b>    | 150 HP |
| <b>ASSIGNED MOTOR POWER AT 220/230 V, 60 HZ, 3-PHASE</b>    | 200 HP |
| <b>ASSIGNED MOTOR POWER AT 460/480 V, 60 HZ, 3-PHASE</b>    | 400 HP |
| <b>ASSIGNED MOTOR POWER AT 600 V, 60 HZ, 3-PHASE</b>        | 500 HP |
| <b>ASSIGNED MOTOR POWER IN-DELTA AT 220/230 V, 60 HZ</b>    | 350 HP |
| <b>ASSIGNED MOTOR POWER IN-DELTA AT 460/480 V, 60 HZ</b>    | 750 HP |
| <b>ASSIGNED MOTOR POWER IN-DELTA AT 575/600 V, 60 HZ</b>    | 850 HP |
| <b>RATED OPERATIONAL POWER AT 220/230 V, 50 HZ</b>          | 160 kW |
| <b>RATED OPERATIONAL POWER AT 400 V, 50 HZ</b>              | 250 kW |
| <b>RATED OPERATIONAL POWER AT 500 V, 50 HZ</b>              | 315 kW |
| <b>RATED OPERATIONAL POWER IN-DELTA AT 220/230 V, 50 HZ</b> | 200 kW |
| <b>RATED OPERATIONAL POWER IN-DELTA AT 400 V, 50 HZ</b>     | 450 kW |
| <b>RATED OPERATIONAL POWER IN-DELTA AT 500 V, 50 HZ</b>     | 450 kW |

## Soft start function

### APPLICATION

- 3-phase motors: Yes
- Soft starting of three-phase asynchronous motors

### DELAY TIME

0 - 120 s, Soft start function, Ramp times

### KICKSTART

Max. 2000 ms (Kickstart Duration)  
100% (Kickstart voltage)

### RAMP/RUN-UP TIME

360 s

### START VOLTAGE

Max. 85 %, Soft start function, Start voltage = turn-off voltage

## Terminal capacities

### SCREWDRIVER SIZE

0.6 x 3.5 mm, Terminal screws, Control circuit cables

### TERMINAL CAPACITY (FLEXIBLE WITH FERRULE)

2 x (1 - 2.5) mm<sup>2</sup>, Control circuit cables  
1 x (2.5 - 4) mm<sup>2</sup>, Control circuit cables  
4 x (70 - 240) mm<sup>2</sup>, Main cables  
6 x (120 - 240) mm<sup>2</sup>, Main cables  
2 x (120 - 240) mm<sup>2</sup>, Main cables

### TERMINAL CAPACITY (SOLID)

2 x (1 - 2.5) mm<sup>2</sup>, Control circuit cables  
2 x (120 - 240) mm<sup>2</sup>, Main cables  
4 x (70 - 240) mm<sup>2</sup>, Main cables  
1 x (2.5 - 4) mm<sup>2</sup>, Control circuit cables  
6 x (120 - 240) mm<sup>2</sup>, Main cables

### TERMINAL CAPACITY (SOLID/STRANDED AWG)

2 x (14 - 12), Control circuit cables  
6 x (4 - 500 kcmil), Main cables  
2 x (4 - 500 kcmil), Main cables  
1 x (14 - 12), Control circuit cables  
4 x (4 - 500 kcmil), Main cables

### TERMINAL CAPACITY (STRANDED)

2 x (1 - 2.5) mm<sup>2</sup>, Control circuit cables  
2 x (120 - 240) mm<sup>2</sup>, Main cables  
6 x (120 - 240) mm<sup>2</sup>, Main cables  
4 x (70 - 240) mm<sup>2</sup>, Main cables  
1 x (2.5 - 4) mm<sup>2</sup>, Control circuit cables

### TIGHTENING TORQUE

0.4 Nm, Screw terminals, Control circuit cables

## Resources

|                            |                                                                                                                                                                            |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| APPLICATION NOTES          | <a href="#">eaton-softstarter-s801-to-s811-ap039013-en-us.pdf</a>                                                                                                          |
| BROCHURES                  | <a href="#">eaton-softstarter-s811-ds7-brochure-br039001en-en-us.pdf</a>                                                                                                   |
| CATALOGUES                 | <a href="#">eaton-drives-soft-starter-catalog-ca04020001zen-us.pdf</a>                                                                                                     |
| DECLARATIONS OF CONFORMITY | <a href="#">eaton-soft-starter-declaration-of-conformity-eu260065en.pdf</a>                                                                                                |
| DRAWINGS                   | <a href="#">eaton-semiconductor-contactors-s811-soft-starter-dimensions-005.eps</a><br><a href="#">eaton-semiconductor-contactors-s811-soft-starter-3d-drawing-005.eps</a> |
| ECAD MODEL                 | <a href="#">DA-CE-ETN.S811_V50P3S</a>                                                                                                                                      |
| INSTALLATION INSTRUCTIONS  | <a href="#">s801+-soft-starter-frame-v-IL03901024E.pdf</a>                                                                                                                 |
| MCAD MODEL                 | <a href="#">eaton-low-voltage-soft-starters-mcad-drawings-s811-v.dwg</a><br><a href="#">DA-CS-s811_v</a>                                                                   |

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**PROJECT NAME:**

**PROJECT NUMBER:**

**PREPARED BY:**

**DATE:**

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