



**Soft starter, 304 A, 200 - 600 V AC, U<sub>s</sub>= 24 V DC, with control unit, Frame size T**



**Part no. S811+T30N3S**  
**Catalog No. 168990**  
**Alternate Catalog No. S811PLUST30N3S**  
**EL-Nummer (Norway) 4137474**

## Delivery program

|   |                 |      |   |
|---|-----------------|------|---|
| Description   |                 |      | This item is only available for a limited time and will be replaced by the following item: 168991, S811+T30P3S                            |
| Function  |                 |      | With internal bypass contacts   |
| Mains supply voltage (50/60 Hz)                             | U <sub>LN</sub> | V AC | 200 - 600   |
| Supply voltage  | U <sub>s</sub>  |      | 24 V DC   |
| Control voltage   | U <sub>C</sub>  |      | 24 V DC   |
| <b>Assigned motor rating (Standard connection, In-Line)</b> |                 |      |   |
| at 400 V, 50 Hz   | P               | kW   | 160   |
| at 460 V, 60 Hz   | P               | HP   | 250   |
| <b>Rated operational current</b>                            |                 |      |   |
| AC-53   | I <sub>e</sub>  | A    | 304   |
| AC-53, In-Delta   | I <sub>e</sub>  | A    | 526   |
| Startup class   |                 |      | CLASS 10 (star-delta replacement)<br>CLASS 20 (heavy starting duty 3 x I <sub>e</sub> for 45 s)<br>CLASS 30 (6 x I <sub>e</sub> for 30 s) |
| Rated operational voltage                                   | U <sub>e</sub>  |      | 200 V<br>230 V<br>400 V<br>480 V<br>600 V   |
| Connection to SmartWire-DT                                  |                 |      | no  |
| Frame size  |                 |      | T   |
| Ordering information  |                 |      | Terminal blocks for the terminals are required for frame sizes T, U, and V -> Accessories   |

## Technical data

### General

|                                       |   |    |   |
|---------------------------------------|---|----|---|
| Standards                             |   |    | IEC/EN 60947-4-2<br>UL 508<br>CSA22.2-14-1995<br>GB14048  |
| Approvals                             |   |    | CE  |
| Approvals                             |   |    | UL<br>CSA<br>C-Tick<br>CCC  |
| Climatic proofing                     |   |    | Damp heat, constant, to IEC 60068-2-3<br>Damp heat, cyclic, to IEC 60068-2-10                           |
| Ambient temperature                   |   |    |   |
| Operation                             | θ | °C | -30 - +50   |
| Storage                               | θ | °C | -50 - +70   |
| Altitude                              |   | m  | 0 - 2000 m, above that each 100 m 0.5% Derating   |
| Mounting position                     |   |    | As required   |
| Degree of protection                  |   |    |   |
| Degree of Protection                  |   |    | IP20 (terminals IP00)   |
| Integrated                            |   |    | An IP20 degree of protection can be achieved on all sides by using optional terminal covers SS-IP20-TU. |
| Protection against direct contact     |   |    | Finger- and back-of-hand proof  |
| Overtoltage category/pollution degree |   |    | II/3  |

|  |                 |    |      |
|--|-----------------|----|------|
| Shock resistance                               |                 |    | 15 g |
| Radio interference level (IEC/EN 55011)        |                 |    | A    |
| Static heat dissipation, non-current-dependent | P <sub>vs</sub> | W  | 45   |
| Weight   |                 | kg | 18.6 |

### Main conducting paths

|  |                 |      |                                 |
|--|-----------------|------|---------------------------------|
| Rated operating voltage                              | U <sub>e</sub>  | V AC | 200 - 600                       |
| Supply frequency                                     | f <sub>LN</sub> | Hz   | 50/60                           |
| Rated operational current                            | I <sub>e</sub>  | A    |                                 |
| AC-53, In-Delta                                      | I <sub>e</sub>  | A    | 526                             |
| AC-53  | I <sub>e</sub>  | A    | 304                             |
| Assigned motor rating (Standard connection, In-Line) |                 |      |                                 |
| at 230 V, 50 Hz                                      | P               | kW   | 90                              |
| at 400 V, 50 Hz                                      | P               | kW   | 160                             |
| at 500 V, 50 Hz                                      | P               | kW   | 200                             |
| at 200 V, 60 Hz                                      | P               | HP   | 100                             |
| at 230 V, 60 Hz                                      | P               | HP   | 100                             |
| at 460 V, 60 Hz                                      | P               | HP   | 250                             |
| at 600 V, 60 Hz                                      | P               | HP   | 300                             |
| Assigned motor rating (delta connection)             |                 |      |                                 |
| at 230 V, 50 Hz                                      | P               | kW   | 160                             |
| at 400 V, 50 Hz                                      | P               | kW   | 250                             |
| at 500 V, 50 Hz                                      | P               | kW   | 315                             |
| at 230 V, 60 Hz                                      |                 | HP   | 200                             |
| at 480 V, 60 Hz                                      |                 | HP   | 450                             |
| at 600 V, 60 Hz                                      | P               | HP   | 500                             |
| Overload cycle to IEC/EN 60947-4-2                   |                 |      |                                 |
| AC-53a   |                 |      | 304 A: AC-53a: 4.0 - 32: 99 - 3 |
| Internal bypass contacts                             |                 |      | ✓                               |
| Short-circuit rating                                 |                 |      |                                 |
| Type "1" coordination                                |                 |      | NZMN3-S320                      |

### Terminal capacities

|                            |  |                 |  |
|----------------------------|--|-----------------|--|
| Cable lengths              |  |                 |  |
| Solid                      |  | mm <sup>2</sup> | 1 x (70 - 240)<br>2 x (25 - 240)                             |
| Flexible with ferrule      |  | mm <sup>2</sup> | 1 x (70 - 240)<br>2 x (25 - 240)                             |
| Stranded                   |  | mm <sup>2</sup> | 1 x (70 - 240)<br>2 x (25 - 240)                             |
| Solid or stranded          |  | AWG             | 1 x (4 - 500 kcmil)<br>2 x (4 - 500 kcmil)                   |
| Tightening torque          |  | Nm              | 25.5 (≤ 150 mm <sup>2</sup> ); 28.3 (> 150 mm <sup>2</sup> ) |
| Screwdriver (PZ: Pozidriv) |  | mm              | 4 mm Innensechskant  |
| Control cables             |  |                 |  |
| Solid                      |  | mm <sup>2</sup> | 1 x (2.5 - 4)<br>2 x (1.0 - 2.5)                             |
| Flexible with ferrule      |  | mm <sup>2</sup> | 1 x (2.5 - 4)<br>2 x (1.0 - 2.5)                             |
| Stranded                   |  | mm <sup>2</sup> | 1 x (2.5 - 4)<br>2 x (1.0 - 2.5)                             |
| Solid or stranded          |  | AWG             | 15 x (12 - 14)<br>2 x (12 - 14)                              |
| Tightening torque          |  | Nm              | 0.4  |
| Screwdriver                |  | mm              | 0,6 x 3,5  |

### Control circuit

|                          |  |      |                      |
|--------------------------|--|------|----------------------|
| Digital inputs           |  |      |                      |
| Control voltage          |  |      |                      |
| DC-operated              |  | V DC | 24 V DC +10 %/- 10 % |
| Current consumption 24 V |  | mA   |                      |
| External 24 V            |  | mA   | 150                  |

|   |            |   |         |                         |
|---|------------|---|---------|-------------------------|
| External 24 V (no-load)   |            |   | mA      | 100                     |
| Pick-up voltage   |            |   | $x U_s$ |                         |
| DC-operated   |            |   | V DC    | 21.6 - 26.4             |
| Drop-out voltage  | $x U_s$    |   |         |                         |
| DC operated   |            |   | V DC    |                         |
| Drop-out voltage, DC-operated, max.                               |            |   | V DC    | 3                       |
| Pick-up time  |            |   |         |                         |
| DC operated   |            |   | ms      | 100                     |
| Drop-out time   |            |   |         |                         |
| DC operated   |            |   | ms      | 100                     |
| Regulator supply  |            |   |         |                         |
| Voltage   | $U_s$      | V |         | 24 V DC +10 %/- 10 %    |
| Current consumption   | $I_e$      |   | mA      | 1000                    |
| Current consumption at peak performance (close bypass) at 24 V DC | $I_{Peak}$ |   | A/ms    | 10/150                  |
| Notes   |            |   |         | External supply voltage |
| Analog inputs   |            |   |         |                         |
| Number of current inputs  |            |   |         | 1                       |
| Current input   |            |   | mA      | 4 - 20                  |
| Relay outputs   |            |   |         |                         |
| Number  |            |   |         | 2                       |
| of which programmable   |            |   |         | 2                       |
| Voltage range   |            |   | V AC    | 120 V AC/DC             |
| AC-11 current range   |            |   | A       | 3 A, AC-11              |

### Soft start function

|                                    |  |  |    |  |
|------------------------------------|--|--|----|--|
| Ramp times                         |  |  |    |  |
| Acceleration                       |  |  | s  |  |
| Ramp time, max.                    |  |  | s  | 180  |
| Deceleration                       |  |  | s  | 0 - 60   |
| Start voltage (= turn-off voltage) |  |  | %  |  |
| Start voltage, max.                |  |  | %  | 85   |
| Start pedestal                     |  |  | %  |  |
| Start voltage, max.                |  |  | %  | 85   |
| Kickstart                          |  |  |    |  |
| Voltage                            |  |  | %  |  |
| Kickstart voltage, max.            |  |  | %  | 100  |
| Duration                           |  |  |    |  |
| 50 Hz                              |  |  | ms |  |
| Kickstart Duration 50 Hz max.      |  |  | ms | 2000   |
| 60 Hz                              |  |  | ms |  |
| Kickstart Duration 60 Hz max.      |  |  | ms | 2000   |
| Fields of application              |  |  |    |  |
| Fields of application              |  |  |    | Soft starting of three-phase asynchronous motors |
| 3-phase motors                     |  |  |    | ✓  |

### Functions

|  |  |  |        |  |
|--|--|--|--------|--|
| Fast switching (semiconductor contactor)               |  |  |        | - (minimum ramp time 1s)                         |
| Soft start function                                    |  |  |        | ✓  |
| Reversing starter                                      |  |  |        | External solution required (reversing contactor) |
| Suppression of closing transients                      |  |  |        | ✓  |
| Current limitation                                     |  |  |        | ✓  |
| Overload monitoring                                    |  |  |        | ✓  |
| Underload monitoring                                   |  |  |        | ✓  |
| Fault memory   |  |  | Faults | 10   |
| Suppression of DC components for motors                |  |  |        | ✓  |
| Potential isolation between power and control sections |  |  |        | ✓  |

|                          |  |            |
|--------------------------|--|------------|
| Communication Interfaces |  | Modbus RTU |
|--------------------------|--|------------|

## Design verification as per IEC/EN 61439

| Technical data for design verification   |            |    |  |
|--|------------|----|--|
| Rated operational current for specified heat dissipation   | $I_n$      | A  | 304  |
| Heat dissipation per pole, current-dependent   | $P_{vid}$  | W  | 0  |
| Equipment heat dissipation, current-dependent  | $P_{vid}$  | W  | 45   |
| Static heat dissipation, non-current-dependent   | $P_{vs}$   | W  | 45   |
| Heat dissipation capacity  | $P_{diss}$ | W  | 0  |
| Operating ambient temperature min.   |            | °C | -30  |
| Operating ambient temperature max.   |            | °C | 50   |
| IEC/EN 61439 design verification   |            |    |  |
| 10.2 Strength of materials and parts   |            |    |  |
| 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 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric 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.   |
| 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 Insulation properties   |            |    |  |
| 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.                         |

## Technical data ETIM 7.0

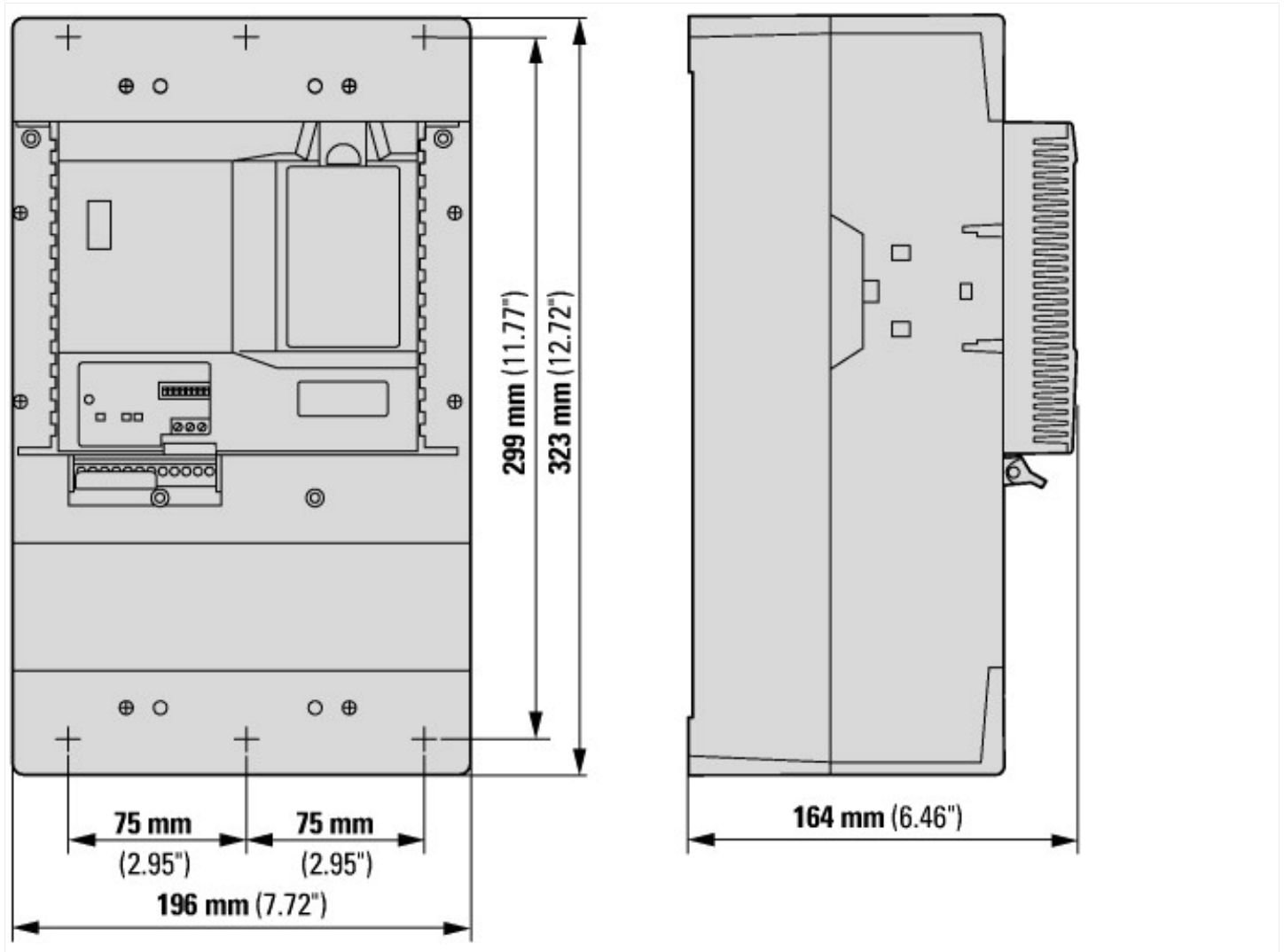
| Low-voltage industrial components (EG000017) / Soft starter (EC000640)   |  |    |                  |
|--|--|----|------------------|
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Load breakout, motor breakout / Semiconductor motor controller or soft starter (ec@ss10.0.1-27-37-09-07 [ACO300011]) |  |    |                  |
| Rated operation current $I_e$ at 40 °C $T_u$   |  | A  | 304              |
| Rated operating voltage $U_e$  |  | V  | 200 - 600        |
| Rated power three-phase motor, inline, at 230 V  |  | kW | 90               |
| Rated power three-phase motor, inline, at 400 V  |  | kW | 160              |
| Rated power three-phase motor, inside delta, at 230 V  |  | kW | 160              |
| Rated power three-phase motor, inside delta, at 400 V  |  | kW | 250              |
| Function   |  |    | Single direction |
| Internal bypass  |  |    | Yes              |
| With display   |  |    | Yes              |
| Torque control   |  |    | No               |
| Rated surrounding temperature without derating   |  | °C | 50               |

|  |   |            |
|--|---|------------|
| Rated control supply voltage Us at AC 50HZ | V | 0 - 0      |
| Rated control supply voltage Us at AC 60HZ | V | 0 - 0      |
| Rated control supply voltage Us at DC      | V | 24 - 24    |
| Voltage type for actuating                 |   | DC         |
| Integrated motor overload protection       |   | Yes        |
| Release class                              |   | Adjustable |
| Degree of protection (IP)                  |   | IP00       |
| Degree of protection (NEMA)                |   | Other      |

## Approvals

|                             |  |  |
|-----------------------------|--|--|
| Product Standards           |  | IEC/EN 60947-4-2; UL 508; CSA C22.2 No. 14; CE marking |
| UL File No.                 |  | E202571  |
| UL Category Control No.     |  | NMFT   |
| CSA File No.                |  | LR 353   |
| CSA Class No.               |  | 3211-06, 2411-01                                       |
| North America Certification |  | UL listed, CSA certified                               |
| Suitable for                |  | Branch Circuits, not as BCPD                           |
| Max. Voltage Rating         |  | 600 Vac  |
| Degree of Protection        |  | IP20 with kit  |

## Dimensions



## Additional product information (links)

|               |   |
|---------------|---|
| Documentation | <a href="http://www.eaton.eu/Europe/Electrical/ProductsServices/AutomationControl/SwitchingProtectingDrivingMotors/SoftStarters/S811/index.htm#tabs-4">http://www.eaton.eu/Europe/Electrical/ProductsServices/AutomationControl/SwitchingProtectingDrivingMotors/SoftStarters/S811/index.htm#tabs-4</a> |
|---------------|---|