# DATASHEET - S811+V42V3S

**Soft starter, 420 A, 200 - 690 V AC, Us= 24 V DC, with control unit and pump algorithm, for 690-V grids, Frame size V**

Powering Business Worldwide™

| | |
|---|---|
| **Part no.** | **S811+V42V3S** |
| **Catalog No.** | **168998** |
| **Alternate Catalog No.** | **S811PLUSV42V3S** |
| **EL-Nummer (Norway)** | **4137482** |

## Delivery program

| | | | |
|---|---|---|---|
| Description | | | With internal bypass contacts |
| Function | | | Soft starter for three-phase loads, with control unit and pump algorithm, for 690-V grids |
| Mains supply voltage (50/60 Hz) | $U_{LN}$ | V AC | 200 - 690 |
| Supply voltage | $U_s$ | | 24 V DC |
| Control voltage | $U_C$ | | 24 V DC |
| **Assigned motor rating (Standard connection, In-Line)** | | | |
| at 400 V, 50 Hz | P | kW | 200 |
| at 690 V, 50 Hz | P | kW | 400 |
| at 460 V, 60 Hz | P | HP | 350 |
| **Rated operational current** | | | |
| AC-53 | $I_e$ | A | 420 |
| Startup class | | | CLASS 10 (star-delta replacement)<br>CLASS 20 (heavy starting duty 3 x $I_e$ for 45 s)<br>CLASS 30 (6 x $I_e$ for 30 s) |
| Rated operational voltage | $U_e$ | | 200 V<br>230 V<br>400 V<br>480 V<br>600 V<br>690 V |
| Connection to SmartWire-DT | | | no |
| Frame size | | | V |
| 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 | | | Protection type IP40 can be achieved on all sides with covers SS-IP20-N. |
| Protection against direct contact | | | Finger- and back-of-hand proof |
| Overvoltage category/pollution degree | | | II/3 |
| Shock resistance | | | 15 g |
| Radio interference level (IEC/EN 55011) | | | A |

| | | | |
|---|---|---|---|
| Static heat dissipation, non-current-dependent | $P_{vs}$ | W | 64 |
| Weight | | kg | 41.4 |

## Main conducting paths

| | | | |
|---|---|---|---|
| Rated operating voltage | $U_e$ | V AC | 200 - 690 |
| Supply frequency | $f_{LN}$ | Hz | 50/60 |
| Rated operational current | $I_e$ | A | |
| AC-53 | $I_e$ | A | 420 |
| Assigned motor rating (Standard connection, In-Line) | | | |
| at 230 V, 50 Hz | P | kW | 132 |
| at 400 V, 50 Hz | P | kW | 200 |
| at 500 V, 50 Hz | P | kW | 250 |
| at 690 V, 50 Hz | P | kW | 400 |
| at 200 V, 60 Hz | P | HP | 150 |
| at 230 V, 60 Hz | P | HP | 150 |
| at 460 V, 60 Hz | P | HP | 350 |
| at 600 V, 60 Hz | P | HP | 450 |
| at 690 V, 60 Hz | P | HP | 500 |
| Assigned motor rating (delta connection) | | | |
| at 690 V, 60 Hz | P | HP | 850 |
| Overload cycle to IEC/EN 60947-4-2 | | | |
| AC-53a | | | 420 A: AC-53a: 4.0 - 32: 99 - 3 |
| Internal bypass contacts | | | ✓ |
| Short-circuit rating | | | |
| Type “1” coordination | | | NZMN3-S500 |

## Terminal capacities

| | | | |
|---|---|---|---|
| Cable lengths | | | |
| Solid | | $mm^2$ | 2 x (120 - 240)<br>4 x (70 - 240)<br>6 x (120 - 240) |
| Flexible with ferrule | | $mm^2$ | 2 x (120 - 240)<br>4 x (70 - 240)<br>6 x (120 - 240) |
| Stranded | | $mm^2$ | 2 x (120 - 240)<br>4 x (70 - 240)<br>6 x (120 - 240) |
| Solid or stranded | | AWG | 2 x (4 - 500 kcmil)<br>4 x (4 - 500 kcmil)<br>6 x (4 - 500 kcmil) |
| Control cables | | | |
| Solid | | $mm^2$ | 1 x (2.5 - 4)<br>2 x (1.0 - 2.5) |
| Flexible with ferrule | | $mm^2$ | 1 x (2.5 - 4)<br>2 x (1.0 - 2.5) |
| Stranded | | $mm^2$ | 1 x (2.5 - 4)<br>2 x (1.0 - 2.5) |
| Solid or stranded | | AWG | 32 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 | 1400 |
| 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 | 360 |
| Deceleration | | s | 0 - 120 |
| 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 | 420 |
| Heat dissipation per pole, current-dependent | $P_{vid}$ | W | 0 |
| Equipment heat dissipation, current-dependent | $P_{vid}$ | W | 64 |
| Static heat dissipation, non-current-dependent | $P_{vs}$ | W | 64 |
| 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

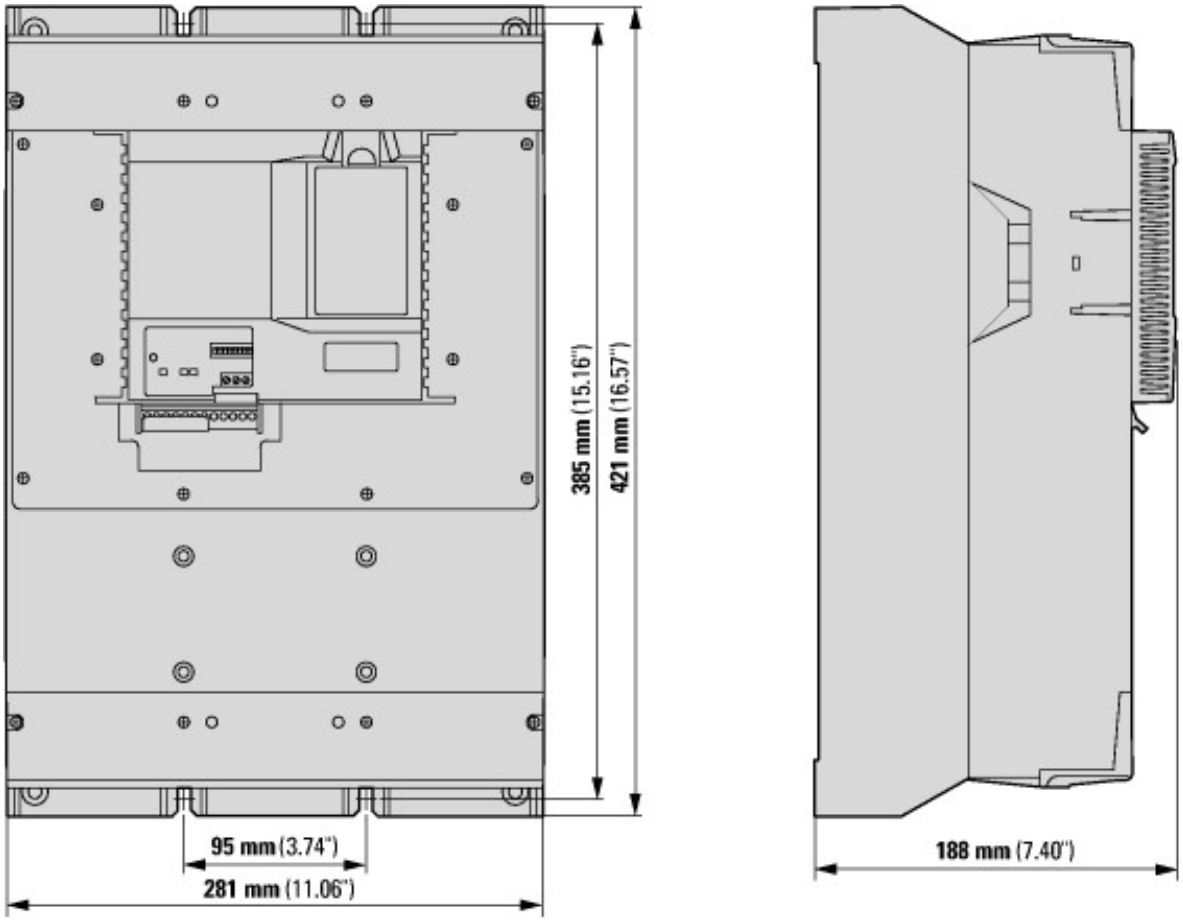
| | | | |
|---|---|---|---|
| Low-voltage industrial components (EG000017) / Soft starter (EC000640) | | | |
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Load breakout, motor breakout / Semiconductor motor controller or soft starter (ecl@ss10.0.1-27-37-09-07 [ACO300011]) | | | |
| Rated operation current Ie at 40 °C Tu | | A | 420 |
| Rated operating voltage Ue | | V | 200 - 690 |
| Rated power three-phase motor, inline, at 230 V | | kW | 132 |
| Rated power three-phase motor, inline, at 400 V | | kW | 200 |
| Rated power three-phase motor, inside delta, at 230 V | | kW | 200 |
| Rated power three-phase motor, inside delta, at 400 V | | kW | 400 |
| 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; CE marking |
| UL File No. | E202571 |
| UL Category Control No. | NMFT |
| North America Certification | UL listed |
| Suitable for | Branch Circuits, not as BCPD |
| Max. Voltage Rating | 690 Vac |
| Degree of Protection | IP20 with kit |

## Dimensions




## Additional product information (links)

| | |
|---|---|
| Documentation | http://www.eaton.eu/Europe/Electrical/ProductsServices/AutomationControl/SwitchingProtectingDrivingMotors/SoftStarters/S811/index.htm#tabs-4 |