



Soft starter, 720 A, 200 - 600 V AC,  $U_s = 24$  V DC, with control unit and pump algorithm, Frame size V



Part no. **S811+V72P3S**  
 Catalog No. **169006**  
 Alternate Catalog No. **S811PLUSV72P3S**  
 EL-Nummer (Norway) **4137490**

### Delivery program

|   |          |      |  |
|---|----------|------|--|
| Description   |          |      | With internal bypass contacts  |
| Function  |          |      | Soft starter for three-phase loads, with control unit and pump algorithm   |
| Mains supply voltage (50/60 Hz)                             | $U_{LN}$ | V AC | 200 - 600  |
| Supply voltage  | $U_s$    |      | 24 V DC  |
| Control voltage   | $U_c$    |      | 24 V DC  |
| <b>Assigned motor rating (Standard connection, In-Line)</b> |          |      |  |
| at 400 V, 50 Hz   | P        | kW   | 400  |
| at 460 V, 60 Hz   | P        | HP   | 600  |
| <b>Rated operational current</b>                            |          |      |  |
| AC-53   | $I_e$    | A    | 720  |
| AC-53, In-Delta   | $I_e$    | A    | 1246   |
| Startup class   |          |      | CLASS 10 (star-delta replacement)<br>CLASS 20 (heavy starting duty $3 \times I_e$ for 45 s)<br>CLASS 30 ( $6 \times I_e$ for 30 s) |
| Rated operational voltage                                   | $U_e$    |      | 200 V<br>230 V<br>400 V<br>480 V<br>600 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

|  |          |    |   |
|--|----------|----|---|
| <b>General</b>                                 |          |    |   |
| 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 |
| <b>Ambient temperature</b>                     |          |    |   |
| Operation                                      | $\theta$ | °C | -30 - +50   |
| Storage  | $\theta$ | °C | -50 - +70   |
| Altitude                                       |          | m  | 0 - 2000 m, above that each 100 m 0.5% Derating                               |
| Mounting position                              |          |    | As required   |
| <b>Degree of protection</b>                    |          |    |   |
| 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  | 127   |

|  |          |      |                                 |
|--|----------|------|---------------------------------|
| Weight   |          | kg   | 41.4                            |
| <b>Main conducting paths</b>                         |          |      |                                 |
| Rated operating voltage                              | $U_e$    | V AC | 200 - 600                       |
| Supply frequency                                     | $f_{LN}$ | Hz   | 50/60                           |
| Rated operational current                            | $I_e$    | A    |                                 |
| AC-53, In-Delta                                      | $I_e$    | A    | 1246                            |
| AC-53  | $I_e$    | A    | 720                             |
| Assigned motor rating (Standard connection, In-Line) |          |      |                                 |
| at 230 V, 50 Hz                                      | P        | kW   | 250                             |
| at 400 V, 50 Hz                                      | P        | kW   | 400                             |
| at 500 V, 50 Hz                                      | P        | kW   | 500                             |
| at 200 V, 60 Hz                                      | P        | HP   | 200                             |
| at 460 V, 60 Hz                                      | P        | HP   | 600                             |
| at 600 V, 60 Hz                                      | P        | HP   | 750                             |
| Assigned motor rating (delta connection)             |          |      |                                 |
| at 230 V, 50 Hz                                      | P        | kW   | 200                             |
| at 400 V, 50 Hz                                      | P        | kW   | 630                             |
| at 500 V, 50 Hz                                      | P        | kW   | 450                             |
| at 230 V, 60 Hz                                      |          | HP   | 500                             |
| at 480 V, 60 Hz                                      |          | HP   | 850                             |
| at 600 V, 60 Hz                                      | P        | HP   | 1300                            |
| Overload cycle to IEC/EN 60947-4-2                   |          |      |                                 |
| AC-53a   |          |      | 720 A: AC-53a: 4.0 - 32: 99 - 3 |
| Internal bypass contacts                             |          |      | ✓                               |
| Short-circuit rating                                 |          |      |                                 |
| Type "1" coordination                                |          |      | NZMN4-ME875                     |

### Terminal capacities

|                       |  |                 |   |
|-----------------------|--|-----------------|---|
| Cable lengths         |  |                 |   |
| Solid                 |  | mm <sup>2</sup> | 2 x (120 - 240)<br>4 x (70 - 240)<br>6 x (120 - 240)              |
| Flexible with ferrule |  | mm <sup>2</sup> | 2 x (120 - 240)<br>4 x (70 - 240)<br>6 x (120 - 240)              |
| Stranded              |  | mm <sup>2</sup> | 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 <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             | 40 x (12 - 14)<br>2 x (12 - 14)                                   |
| Tightening torque     |  |                 |   |
| Screwdriver           |  | Nm              | 0.4   |
|                       |  | 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 |  |      |                      |
| External 24 V            |  | mA   | 150                  |
| External 24 V (no-load)  |  | mA   | 100                  |
| Pick-up voltage          |  |      |                      |
| 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  | 720  |
| Heat dissipation per pole, current-dependent   | $P_{vid}$  | W  | 0  |
| Equipment heat dissipation, current-dependent  | $P_{vid}$  | W  | 127  |
| Static heat dissipation, non-current-dependent   | $P_{vs}$   | W  | 127  |
| 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

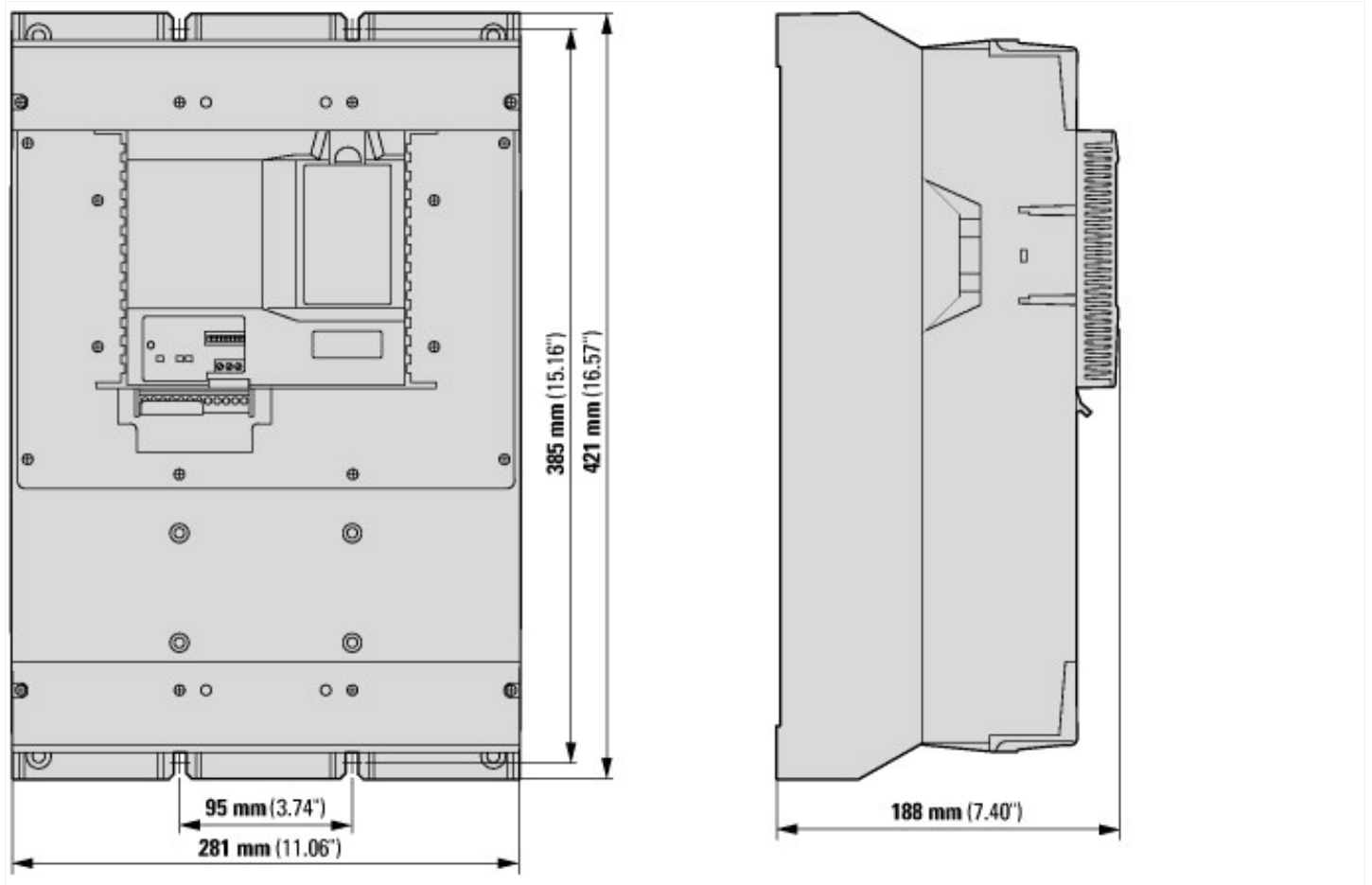
| Low-voltage industrial components (EG000017) / Soft starter (EC000640)  |  |    |                  |
|---|--|----|------------------|
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Load breakout, motor breakout / Semiconductor motor controller or soft starter (ec1@ss10.0.1-27-37-09-07 [ACO300011]) |  |    |                  |
| Rated operation current $I_e$ at 40 °C $T_u$  |  | A  | 720              |
| Rated operating voltage $U_e$   |  | V  | 200 - 600        |
| Rated power three-phase motor, inline, at 230 V   |  | kW | 200              |
| Rated power three-phase motor, inline, at 400 V   |  | kW | 400              |
| Rated power three-phase motor, inside delta, at 230 V   |  | kW | 200              |
| Rated power three-phase motor, inside delta, at 400 V   |  | kW | 630              |
| Function  |  |    | Single direction |
| Internal bypass   |  |    | Yes              |
| With display  |  |    | Yes              |
| Torque control  |  |    | No               |
| Rated surrounding temperature without derating  |  | °C | 50               |
| Rated control supply voltage $U_s$ at AC 50HZ   |  | V  | 0 - 0            |
| Rated control supply voltage $U_s$ at AC 60HZ   |  | V  | 0 - 0            |
| Rated control supply voltage $U_s$ 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  |
| 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> |
|---------------|---|