



**Variable frequency drive SPX 3-/3-phase 480 V 37 kW ; dynamic vector control; degree of protection IP21; integrated EMC filter**

**Part no.** SPX050A1-4A1N1  
**Article no.** 125331  
**Catalog No.** SPX050A1-4A1N1

## Delivery program

|                                    |                 |    |                                                                             |
|------------------------------------|-----------------|----|-----------------------------------------------------------------------------|
| Product range                      |                 |    | Variable frequency drives                                                   |
| Part group reference (e.g. DIL)    |                 |    | SPX                                                                         |
| Rated operational voltage          | U <sub>e</sub>  |    | 400 V AC, 3-phase<br>480 V AC, 3-phase<br>500 V AC, 3-phase                 |
| Output voltage with V <sub>e</sub> | U <sub>2</sub>  |    | 400 V AC, 3-phase<br>480 V AC, 3-phase<br>500 V AC, 3-phase                 |
| Mains voltage (50/60Hz)            | U <sub>LN</sub> | V  | 380 (-15%) - 500 (+10%)                                                     |
| <b>Rated operational current</b>   |                 |    |                                                                             |
| At 150% overload                   | I <sub>e</sub>  | A  | 72                                                                          |
| At 110% overload                   | I <sub>e</sub>  | A  | 87                                                                          |
| Note                               |                 |    | Overload cycle for 60 s every 600 s                                         |
| <b>Assigned motor rating</b>       |                 |    |                                                                             |
| Note                               |                 |    | For AC motors with internal and external ventilation with 50 Hz / 60 Hz     |
| Note                               |                 |    | Overload cycle for 60 s every 600 s                                         |
| Note                               |                 |    | at 400 V, 50 Hz                                                             |
| 150 % Overload                     | P               | kW | 37                                                                          |
| 110 % Overload                     | P               | kW | 45                                                                          |
| 150 % Overload                     | I <sub>M</sub>  | A  | 68                                                                          |
| 110 % Overload                     | I <sub>M</sub>  | A  | 81                                                                          |
| Note                               |                 |    | at 440 - 480 V, 60 Hz                                                       |
| 150 % Overload                     | P               | HP | 50                                                                          |
| 110 % Overload                     | P               | HP | 60                                                                          |
| 150 % Overload                     | I <sub>M</sub>  | A  | 65                                                                          |
| 110 % Overload                     | I <sub>M</sub>  | A  | 77                                                                          |
| Degree of Protection               |                 |    | IP21                                                                        |
| Fieldbus connection (optional)     |                 |    | PROFIBUS-DP<br>LonWorks<br>CANopen®<br>DeviceNet<br>Modbus-TCP<br>BACnet/IP |
| Fitted with                        |                 |    | Radio interference suppression filter<br>OLED display<br>DC link choke      |
| Frame size                         |                 |    | FR7                                                                         |
| Connection to SmartWire-DT         |                 |    | No                                                                          |

## Technical data

|                    |                |   |                                                                                                                                     |
|--------------------|----------------|---|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>General</b>     |                |   |                                                                                                                                     |
| Standards          |                |   | Specification for general requirements: IEC/EN 61800-2<br>EMC requirements: IEC/EN 61800-3<br>Safety requirements: IEC/EN 61800-5-1 |
| Certifications     |                |   | CE, UL, cUL, c-Tick                                                                                                                 |
| Production quality |                |   | RoHS, ISO 9001                                                                                                                      |
| Climatic proofing  | ρ <sub>w</sub> | % | < 95% relative humidity, no condensation, no corrosion, no dripping water                                                           |

|                                   |   |    |                                                                                                                                                                       |
|-----------------------------------|---|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ambient temperature</b>        |   |    |                                                                                                                                                                       |
| operation (150 % overload)        | θ | °C | -10 - +50                                                                                                                                                             |
| operation (110 % overload)        | θ | °C | -10 - +40                                                                                                                                                             |
| Storage                           | θ | °C | -40 - +70                                                                                                                                                             |
| <b>Radio interference level</b>   |   |    |                                                                                                                                                                       |
| Radio interference class (EMC)    |   |    | C2, C3, depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary. |
| Environment (EMC)                 |   |    | 1st and 2nd environments                                                                                                                                              |
| <b>Mounting position</b>          |   |    |                                                                                                                                                                       |
| Altitude                          |   | m  | 0 - 1000 m above sea level<br>above 1000 m with 1 % performance reduction per 100 m<br>max. 3000 m                                                                    |
| <b>Degree of Protection</b>       |   |    |                                                                                                                                                                       |
| Protection against direct contact |   |    | IP21                                                                                                                                                                  |
|                                   |   |    | BGV A3 (VBG4, finger- and back-of-hand proof)                                                                                                                         |

## Main circuit

|                                       |            |     |                                                                                                |
|---------------------------------------|------------|-----|------------------------------------------------------------------------------------------------|
| <b>Supply</b>                         |            |     |                                                                                                |
| Rated operational voltage             | $U_e$      |     | 400 V AC, 3-phase<br>480 V AC, 3-phase<br>500 V AC, 3-phase                                    |
| Mains voltage (50/60Hz)               | $U_{LN}$   | V   | 380 (-15%) - 500 (+10%)                                                                        |
| System configuration                  |            |     | AC supply systems with earthed center point                                                    |
| Supply frequency                      | $f_{LN}$   | Hz  | 50/60                                                                                          |
| Frequency range                       | $f_{LN}$   | Hz  | 45 - 66                                                                                        |
| <b>Power section</b>                  |            |     |                                                                                                |
| Function                              |            |     | Frequency inverter with internal DC link and IGBT inverter                                     |
| Output voltage with $V_e$             | $U_2$      |     | 400 V AC, 3-phase<br>480 V AC, 3-phase<br>500 V AC, 3-phase                                    |
| Output Frequency                      | $f_2$      | Hz  | 0 - 50/60 (max. 320)                                                                           |
| Switching frequency                   | $f_{PWM}$  | kHz | 3.6<br>adjustable 1 - 10                                                                       |
| Operation Mode                        |            |     | U/f control<br>sensorless vector control (SLV)<br>optional: Vector control with feedback (CLV) |
| Frequency resolution (setpoint value) | $\Delta f$ | Hz  | 0.01                                                                                           |
| <b>Rated operational current</b>      |            |     |                                                                                                |
| At 150% overload                      | $I_e$      | A   | 72                                                                                             |
| At 110% overload                      | $I_e$      | A   | 87                                                                                             |
| Fitted with                           |            |     | Radio interference suppression filter<br>OLED display<br>DC link choke                         |
| Frame size                            |            |     | FR7                                                                                            |
| <b>Motor feeder</b>                   |            |     |                                                                                                |
| Note                                  |            |     | For AC motors with internal and external ventilation with 50 Hz / 60 Hz                        |
| Note                                  |            |     | Overload cycle for 60 s every 600 s                                                            |
| Note                                  |            |     | at 400 V, 50 Hz                                                                                |
| 150 % Overload                        | P          | kW  | 37                                                                                             |
| 110 % Overload                        | P          | kW  | 45                                                                                             |
| Note                                  |            |     | at 440 - 480 V, 60 Hz                                                                          |
| 150 % Overload                        | P          | HP  | 50                                                                                             |
| 110 % Overload                        | P          | HP  | 60                                                                                             |

## Control section

|                          |       |   |                                                                            |
|--------------------------|-------|---|----------------------------------------------------------------------------|
| External control voltage | $U_c$ | V | 24 V DC (max. 250 mA)                                                      |
| Reference voltage        | $U_s$ | V | 10 V DC (max. 10 mA)                                                       |
| Analog inputs            |       |   | 2, parameterizable, 0 - 10 V DC, 0/4 - 20 mA                               |
| Analog outputs           |       |   | 1, parameterizable, 0/4 - 20 mA                                            |
| Digital inputs           |       |   | 6, parameterizable, max. 30 V DC                                           |
| Digital outputs          |       |   | 1, parameterizable, 48 V DC/50 mA                                          |
| Relay outputs            |       |   | 2, parameterizable, N/O, 8 A (24 V DC) / 8 A (250 V AC) / 0,4 A (125 V DC) |

## Assigned switching and protective elements

|                                               |  |  |             |
|-----------------------------------------------|--|--|-------------|
| Power Wiring                                  |  |  |             |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C) |  |  | DX-LN3-100  |
| Motor feeder                                  |  |  |             |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C) |  |  | DX-LM3-080  |
| 110 % overload (VT/I <sub>L</sub> , at 40 °C) |  |  | DX-LM3-100  |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C) |  |  | DX-SIN3-072 |
| 110 % overload (VT/I <sub>L</sub> , at 40 °C) |  |  | DX-SIN3-090 |

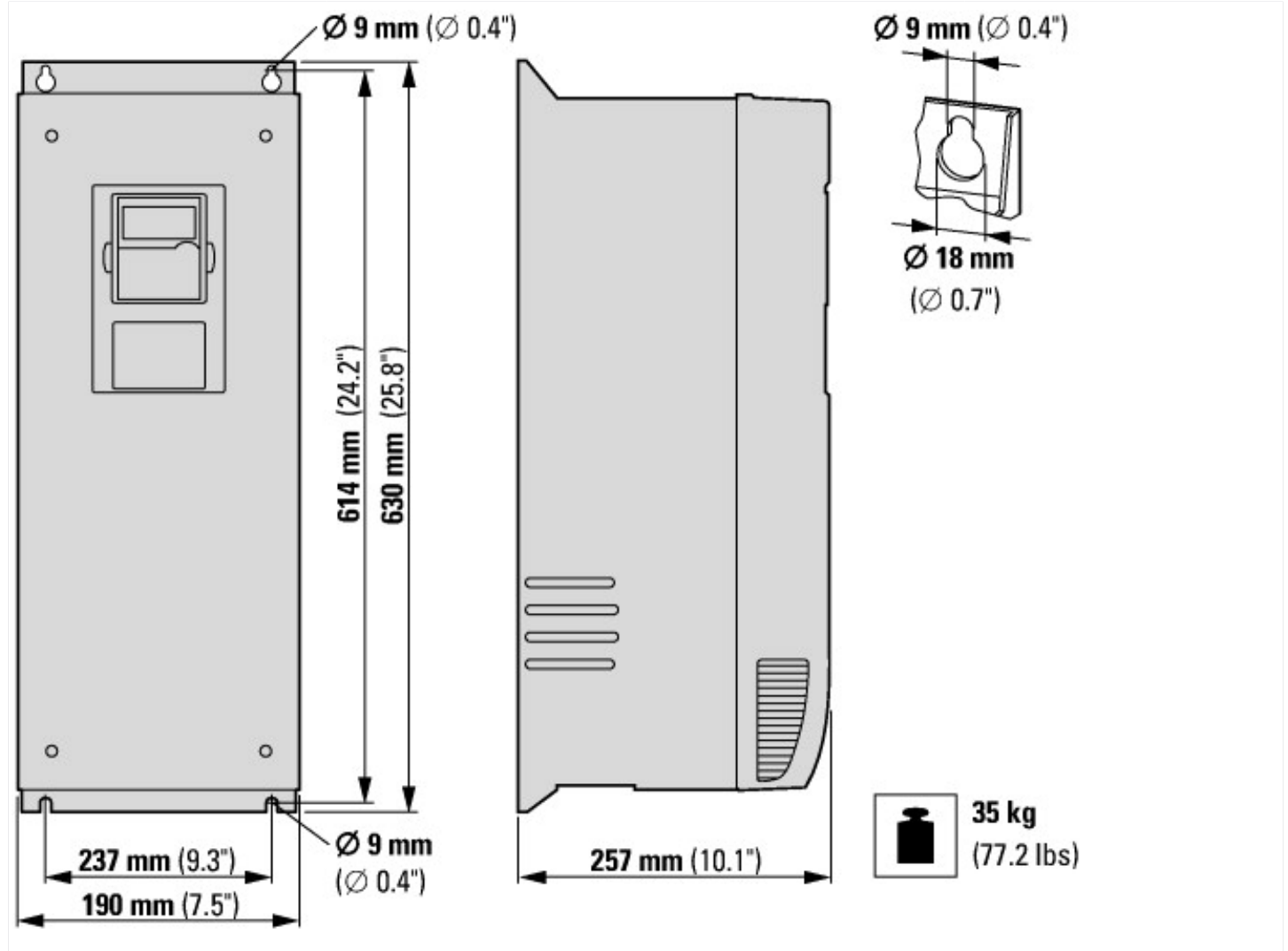
## Design verification as per IEC/EN 61439

|                                                                                                                        |                  |   |                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------|------------------|---|----------------------------------------------------------------------------------------------------------------------------------|
| Technical data for design verification                                                                                 |                  |   |                                                                                                                                  |
| Rated operational current for specified heat dissipation                                                               | I <sub>n</sub>   | A | 72                                                                                                                               |
| Equipment heat dissipation, current-dependent                                                                          | P <sub>vid</sub> | W | 925                                                                                                                              |
| 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.                         |

## Approvals

|                                      |  |  |                                                                     |
|--------------------------------------|--|--|---------------------------------------------------------------------|
| Product Standards                    |  |  | UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking |
| UL File No.                          |  |  | E134360                                                             |
| UL Category Control No.              |  |  | NMMS, NMMS2, NMMS7, NMMS8                                           |
| CSA File No.                         |  |  | UL report applies to both US and Canada                             |
| CSA Class No.                        |  |  | 3211-06                                                             |
| North America Certification          |  |  | UL listed, certified by UL for use in Canada                        |
| Specially designed for North America |  |  | No                                                                  |
| Suitable for                         |  |  | Branch circuits                                                     |
| Max. Voltage Rating                  |  |  | 3~ 480 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)            |
| Degree of Protection                 |  |  | IEC: IP21                                                           |

## Dimensions



## Additional product information (links)

IL04020008Z Instructions for 9000X frequency inverter: SVX, SPX

IL04020008Z Instructions for 9000X frequency inverter: SVX, SPX [ftp://ftp.moeller.net/DOCUMENTATION/AWA\\_INSTRUCTIONS/IL04020008Z2012\\_08.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL04020008Z2012_08.pdf)

MN04001004 Operating Manual for 9000X Variable Frequency Drives

MN04001004 Bedienhandbuch Frequenzrichter 9000X - Deutsch [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04001004Z\\_DE.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04001004Z_DE.pdf)

MN04004001 Application manual 9000X variable frequency drives

MN04004001 Applikationshandbuch Frequenzrichter 9000X - Deutsch [ftp://ftp.moeller.net/DOCUMENTATION/AWB\\_MANUALS/MN04004001Z\\_DE.pdf](ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN04004001Z_DE.pdf)

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