



**Variable frequency drive SPX 3-/3-phase 690 V 30 kW ; dynamic vector control; protection type IP54; integrated EMC filter**



**Part no. SPX030A2-5A4N1**  
**Catalog No. 125315**  
**Eaton Catalog No. SPX030A2-5A4N1**

## Technical data

### General

|                                   |          |    |                                                                                                                                                                       |
|-----------------------------------|----------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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, RCM                                                                                                                                                      |
| Production quality                |          |    | RoHS, ISO 9001                                                                                                                                                        |
| Climatic proofing                 | $\rho_w$ | %  | < 95% relative humidity, no condensation, no corrosion, no dripping water                                                                                             |
| Ambient temperature               |          |    |                                                                                                                                                                       |
| operation (150 % overload)        | $\theta$ | °C | -10 - +50                                                                                                                                                             |
| operation (110 % overload)        | $\theta$ | °C | -10 - +40                                                                                                                                                             |
| Storage                           | $\theta$ | °C | -40 - +70                                                                                                                                                             |
| Radio interference level          |          |    |                                                                                                                                                                       |
| 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 as per EN 61800-3                                                                                                                            |
| Mounting position                 |          |    | Vertical                                                                                                                                                              |
| Altitude                          |          | m  | 0 - 1000 m above sea level<br>above 1000 m with 1 % performance reduction per 100 m<br>max. 3000 m                                                                    |
| Degree of Protection              |          |    | IP54                                                                                                                                                                  |
| Protection against direct contact |          |    | BGV A3 (VBG4, finger- and back-of-hand proof)                                                                                                                         |

### Main circuit

|                                       |            |     |                                                                                                |
|---------------------------------------|------------|-----|------------------------------------------------------------------------------------------------|
| Supply                                |            |     |                                                                                                |
| Rated operational voltage             | $U_e$      |     | 600 V AC, 3-phase<br>690 V AC, 3-phase                                                         |
| Mains voltage (50/60Hz)               | $U_{LN}$   | V   | 525 (-15%) - 690 ( $\pm 10\%$ )                                                                |
| System configuration                  |            |     | AC supply systems with earthed center point                                                    |
| Supply frequency                      | $f_{LN}$   | Hz  | 50/60                                                                                          |
| Frequency range                       | $f_{LN}$   | Hz  | 45 - 66                                                                                        |
| Power section                         |            |     |                                                                                                |
| Function                              |            |     | Frequency inverter with internal DC link and IGBT inverter                                     |
| Output voltage with $V_e$             | $U_2$      |     | 600 V AC, 3-phase<br>690 V AC, 3-phase                                                         |
| Output Frequency                      | $f_2$      | Hz  | 0 - 50/60 (max. 320)                                                                           |
| Switching frequency                   | $f_{PWM}$  | kHz | 1.5<br>adjustable 1 - 6                                                                        |
| 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                                                                                           |
| Rated operational current             |            |     |                                                                                                |
| At 150% overload                      | $I_e$      | A   | 34                                                                                             |
| At 110% overload                      | $I_e$      | A   | 41                                                                                             |
| Fitted with                           |            |     | Radio interference suppression filter<br>OLED display<br>DC link choke                         |

|                |   |    |                                                                         |
|----------------|---|----|-------------------------------------------------------------------------|
| Frame size     |   |    | FR7                                                                     |
| Motor feeder   |   |    |                                                                         |
| 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 690 V, 50 Hz                                                         |
| 150 % Overload | P | kW | 30                                                                      |
| 110 % Overload | P | kW | 37                                                                      |
| Note           |   |    | at 690 V, 60 Hz                                                         |
| 150 % Overload | P | HP | 30                                                                      |
| 110 % Overload | P | HP | 40                                                                      |

### Control section

|                          |                |   |                                                                            |
|--------------------------|----------------|---|----------------------------------------------------------------------------|
| External control voltage | U <sub>c</sub> | V | 24 V DC (max. 250 mA)                                                      |
| Reference voltage        | U <sub>s</sub> | 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-LN3-050     |
| Motor feeder                                  |  |  |                |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C) |  |  | DX-LM3-035     |
| 110 % overload (VT/I <sub>L</sub> , at 40 °C) |  |  | DX-LM3-050     |
| 150 % overload (CT/I <sub>H</sub> , at 50 °C) |  |  | SIN-0052-6-0-P |
| 110 % overload (VT/I <sub>L</sub> , at 40 °C) |  |  | SIN-0052-6-0-P |

## Design verification as per IEC/EN 61439

|                                                                                                                        |                   |    |                                                                    |
|------------------------------------------------------------------------------------------------------------------------|-------------------|----|--------------------------------------------------------------------|
| Technical data for design verification                                                                                 |                   |    |                                                                    |
| Rated operational current for specified heat dissipation                                                               | I <sub>n</sub>    | A  | 34                                                                 |
| Heat dissipation per pole, current-dependent                                                                           | P <sub>vid</sub>  | W  | 0                                                                  |
| Equipment heat dissipation, current-dependent                                                                          | P <sub>vid</sub>  | W  | 750                                                                |
| Static heat dissipation, non-current-dependent                                                                         | P <sub>vs</sub>   | W  | 0                                                                  |
| Heat dissipation capacity                                                                                              | P <sub>diss</sub> | W  | 0                                                                  |
| Operating ambient temperature min.                                                                                     |                   | °C | -10                                                                |
| Operating ambient temperature max.                                                                                     |                   | °C | 50                                                                 |
|                                                                                                                        |                   |    | Operation (with 150 % overload)                                    |
| 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~ 690 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)            |
| Degree of Protection                 |  | IEC: IP54                                                           |

## Dimensions

