



**Variable frequency drive SPX 3-/3-phase 690 V 250 kW ; dynamic vector control; protection type IP54; integrated EMC filter; with input fuse**



**Part no. SPX250A2-5A4N1**  
**Catalog No. 125410**  
**Eaton Catalog No. SPX250A2-5A4N1**

## Technical data

### General

Standards			Specification for general requirements: IEC/EN 61800-2 EMC requirements: IEC/EN 61800-3 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 above 1000 m with 1 % performance reduction per 100 m 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 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 690 V AC, 3-phase
Output Frequency	$f_2$	Hz	0 - 50/60 (max. 320)
Switching frequency	$f_{PWM}$	kHz	1.5 adjustable 1 - 6
Operation Mode			U/f control sensorless vector control (SLV) optional: Vector control with feedback (CLV)
Frequency resolution (setpoint value)	$\Delta f$	Hz	0.01
Rated operational current			
At 150% overload	$I_e$	A	261
At 110% overload	$I_e$	A	325
Fitted with			Radio interference suppression filter OLED display DC link choke

Frame size			FR10
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	250
110 % Overload	P	kW	315
Note			at 690 V, 60 Hz
150 % Overload	P	HP	250
110 % Overload	P	HP	300

### 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

Motor feeder			
150 % overload (CT/I <sub>H</sub> , at 50 °C)			DX-LM3-260
110 % overload (VT/I <sub>L</sub> , at 40 °C)			DX-LM3-450
150 % overload (CT/I <sub>H</sub> , at 50 °C)			SIN-0390-6-0-P
110 % overload (VT/I <sub>L</sub> , at 40 °C)			SIN-0390-6-0-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	261
Heat dissipation per pole, current-dependent	P <sub>vid</sub>	W	0
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W	6250
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.

## Technical data ETIM 6.0

Low-voltage industrial components (EG000017) / Frequency converter =< 1 kV (EC001857)		
Electric engineering, automation, process control engineering / Electrical drive / Static frequency converter / Static frequency converter = < 1 kv (ec@ss8.1-27-02-31-01 [AKE177011])		
Mains voltage	V	525 - 690
Mains frequency		50/60 Hz
Number of phases input		3
Number of phases output		3
Max. output frequency	Hz	320
Max. output voltage	V	690
Rated output current I2N	A	325
Max. output at quadratic load at rated output voltage	kW	315
Max. output at linear load at rated output voltage	kW	250
With control unit		Yes
Application in industrial area permitted		Yes
Application in domestic- and commercial area permitted		Yes
Supporting protocol for TCP/IP		Yes
Supporting protocol for PROFIBUS		Yes
Supporting protocol for CAN		Yes
Supporting protocol for INTERBUS		No
Supporting protocol for ASI		No
Supporting protocol for KNX		No
Supporting protocol for MODBUS		No
Supporting protocol for Data-Highway		Yes
Supporting protocol for DeviceNet		Yes
Supporting protocol for SUCONET		No
Supporting protocol for LON		Yes
Supporting protocol for PROFINET IO		No
Supporting protocol for PROFINET CBA		No
Supporting protocol for SERCOS		No
Supporting protocol for Foundation Fieldbus		No
Supporting protocol for EtherNet/IP		No
Supporting protocol for AS-Interface Safety at Work		No
Supporting protocol for DeviceNet Safety		No
Supporting protocol for INTERBUS-Safety		No
Supporting protocol for PROFI-safe		No
Supporting protocol for SafetyBUS p		No
Supporting protocol for other bus systems		Yes
Number of HW-interfaces industrial Ethernet		0
Number of HW-interfaces PROFINET		0
Number of HW-interfaces RS-232		0
Number of HW-interfaces RS-422		0
Number of HW-interfaces RS-485		1
Number of HW-interfaces serial TTY		0
Number of HW-interfaces USB		0
Number of HW-interfaces parallel		0
Number of HW-interfaces other		1
With optical interface		No

With PC connection		Yes
Integrated breaking resistance		No
4-quadrant operation possible		Yes
Type of converter		U converter
Degree of protection (IP)		IP54
Height	mm	2020
Width	mm	595
Depth	mm	602
Relative symmetric net frequency tolerance	%	10
Relative symmetric net current tolerance	%	10

## 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 Wye)
Degree of Protection		IEC: IP54

## Dimensions

