



**FIRST CLASS RIDE
WITH VACON AC DRIVE**

vacon
DRIVEN BY DRIVES



VACON AC DRIVES

- LIFT YOUR ELEVATORS TO EXCELLENCE

Vacon is focused on vertical transportation and is dedicated to absolute elevator control. Our products possess those qualities that make the elevator comfortable, safe and silent for the passengers.

Vacon AC drives are the best choice for both new installations and elevator modernization projects. By choosing Vacon, you can cut unnecessary equipment costs and save energy. Vacon drives also enable you to save process costs by minimizing the commissioning time. Vacon makes elevators more comfortable by refining the smooth control during acceleration and deceleration. Silent running has been achieved by reducing the effects that cause electrical and magnetic noise.

Vacon AC drives have an important competitive edge; they are designed with a very small footprint and have the smallest possible space requirement. They appear neat and inconspicuous, and their modularity has been designed for quick and easy servicing, which makes them ideally suited for the elevator market. Vacon has an extensive history and experience with AC drives and the elevator market, and its products meet all the requirements and recommendations within the industry.

Main benefits and features

- Specific application with elevator-specific functions
- Auto-tuning at zero speed for asynchronous motors
- Optimized motor control software for each motor technology*
- Thermostatic fan control to reduce drive noise
- Low vibrations during acceleration and deceleration
- Low magnetic motor noise*
- Motor noise compensation during open and close brake transition
- Direct to floor*
- Short-floor function
- Door opening signals
- CANopen elevator profile DSP-417*
- Modular concept
- Built-in brake circuit
- Removable control panel with internal memory*
- High level EMC filtering

* Vacon NXP only

PLACING SAFETY FIRST

New safety regulations and the latest technological improvements have become an important issue to take into account for all existing elevators, when a modernization or upgrade solution is considered.

For Vacon, the list of recommendations (95/216/EC) and standard (EN81-1) from the European Committee for Standardization, stating the most important safety points to be addressed for all existing elevators, is the guideline of elevator safety. All the points are considered as safety rules, not just recommendations. Vacon AC drives place reliably these important safety points first in the design.

Standards and regulations

In order to comply and harmonize with all of the standards and regulations, the Vacon AC drives have been designed according to:

- EN 61800-3, EN 61000-6-3,4, EN 50081-1,2, EN55011 Class A, B
- IEC 6100-6-2, IEC 61800-3
- Machinery directive to EN954-1 Cat.3 with OPT-AF option board
- Electrical safety to EN 50178 (1997)
- Harmonics according to EN 12015: several technical solutions are available
- ATEX certified motors according to directive 94/9/EC

The high flexibility level of the Vacon AC drives allows control of a wide range of systems and applications.

- Geared and gearless systems
- Asynchronous and synchronous (PMM) motors
- Open and closed loop motor control modes
- Evacuation process with an UPS
- Full elevator control with an embedded PLC
- Regenerative system, $\cos \varphi \approx 1$

Technical data	
Power range	3...18.5 kW*
Input voltage U_{in}	208...240 V; 380...500 V $\pm 10\%$
Control performance	Open and closed loop vector control
Switching frequency	1...16 kHz
Temperature	-10°...+40°C
Protections	Overvoltage, undervoltage, earth fault, mains supervision, overcurrent, unit overtemperature, motor overload, motor stall, motor underload, short-circuit of +24 V and 10 V references voltage, and all of the specific protection for the elevator application.

* For high power range, please contact your official Vacon office.



VACON NXP

The Vacon NXP is the high performance drive for geared and gearless elevators, working with both asynchronous and synchronous motors in open and closed loop.

Easy integration and high flexibility for all elevator control systems

- Parameters in elevator terminology
- Closed loop mode with incremental, EnDat, Sin/Cos encoder
- Electronic angle identification of PMMs, if Sin/Cos encoder is used
- Programmable logic signals cycle
- 7 speed references
- S-ramp sets for different speed profiles
- Direct control of motor and brake contactors
- Versatile brake control logic
- Start-up wizard function for each kind of motor (IM and PMM)
- Switch drive control mode through one master parameter
- Fast roll-back compensation with/without load cell
- Programmable user interface for customer service level
- Data logging and multi-monitor function through keypad
- Monitoring maintenance values
- Brake contactor feedback supervision
- Emergency stop function
- Speed deviation fault
- Floor overspeed protection, for closed loop
- Brake status supervision (when required)
- Motor winding temperature supervision for PMM (when required)



Product specification

Mains voltage 208–240 V, 50/60 Hz, 3 ~

AC drive type*	kW	I_n (A) ¹	I_{max} (A) ²	Dimensions WxHxD (mm)	Weight kg
NXP 0032 2	5.5	25	48	144x391x214	8.1
NXP 0048 2	7.5	31	60	195x519x237	18.5
NXP 0061 2	11	48	90	195x519x237	18.5

Mains voltage 380–500 V, 50/60 Hz, 3 ~

AC drive type*	kW	I_n (A) ¹	I_{max} (A) ²	Dimensions WxHxD (mm)	Weight kg
NXP 0009 5	3	7.6	14	128x292x190	5
NXP 0012 5	4	9.5	17	128x292x190	5
NXP 0013 5	5.5	12	23	128x292x190	5
NXP 0031 5	7.5	16	30	144x391x214	8.1
NXP 0032 5	11	24	45	144x391x214	8.1
NXP 0038 5	15	30	60	195x519x237	18.5
NXP 0061 5	18.5	40	80	195x519x237	18.5

* These values do not have any connection with other Vacon catalogues

[1] Max. continuous output current for elevator duty cycle

[2] The I_{max} allowed in the case of the root mean square current in the cycle operation is 80 % of the I_n

- Rating at 8 kHz switching frequency, 50 % ED.
- Peak current at acceleration time 200 % / 3 sec.
- Max. temperature 40°C



VACON NXP OPTION BOARDS

When a closed loop is needed, the Vacon NXP drive permits the control of IMs and PMMs with the following option boards.

Incremental encoder

OPT-A5 (10...24 DC)

Terminal	Technical information
1 DIC1A+	Pulse input A
2 DIC1A-	
3 DIC2B+	Pulse input B; Phase shift of 90 degrees compared to pulse input A
4 DIC2B-	
5 DIC3Z+	Pulse input Z; one pulse per revolution
6 DIC3Z-	
7 ENC1Q	Qualifier input
8 DIC4	Fast DI
9 GND	Ground for control and inputs ENC1Q and DIC4
10 +15V/24V	Control voltage (auxiliary voltage) output to encoder Output voltage selectable with jumper X4

OPT-A4 (TTL signals)

Terminal	Technical information
1 DIC1A+	Pulse input A
2 DIC1A-	
3 DIC2B+	Pulse input B; Phase shift of 90 degrees compared to pulse input A
4 DIC2B-	
5 DIC3Z+	Pulse input Z; one pulse per revolution
6 DIC3Z-	
7 ENC1Q	Qualifier input
8 DIC4	Fast DI
9 GND	Ground for control and inputs ENC1Q and DIC4
10 +5 V/15 V/24 V	Control voltage (auxiliary voltage) output to encoder Output voltage selectable with jumper X4

EnDat encoder

OPT-BE/BB*

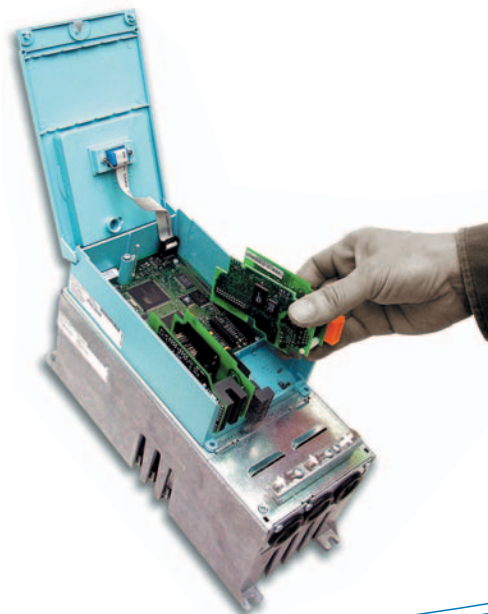
Terminal	Technical information
1 Data +	Digital serial data
2 Data -	
3 Clock +	Clock system
4 Clock -	
5 Sin +	Sinus analog signal
6 Sin -	
7 Cos +	Cosinus analog signal
8 Cos -	
10 +5 V/12 V/15 V	Control voltage (auxiliary voltage) Output to encoder Output voltage selectable with jumper

* When encoder simulation output is required

Sin/Cos encoder

OPT-AK

Terminal	Technical information
1 NC	Not used
2 NC	
3 R +	Reference pulse
4 R -	
5 Sin +	Sinus analog signal
6 Sin -	
7 Cos +	Cosinus analog signal
8 Cos -	
9 GND	Ground for control and inputs
10 +5 V/12 V/15 V	Control voltage (auxiliary voltage) Output to encoder Output voltage selectable with jumper



The Vacon NXL is the most suitable product for the modernization market for upgrade solutions installed with existing induction motors in open loop control mode.

Main advantages

- Compact economical solution
- Auto-tuning function: parameters set using motor nameplate values
- Smooth load transfer from the brake to the motor and vice-versa
- Accurate slip control
- Optimized sensorless vector control to reduce the torque ripples during travel speed
- Easy migration process from the actual drive

Easy integration for all existing and new elevator control systems

- Programmable logic signals cycle
- 7 speed references
- S-ramp sets for different speed profiles
- Versatile brake control logic
- Monitoring maintenance values
- Brake contactor supervision
- Emergency stop function
- Direct control of motor and brake contactors
- Brake status supervision (when required)

Product specification

Mains voltage 380–500 V, 50/60 Hz, 3 ~

AC drive type*	kW	\bar{I}_n (A) ¹	\bar{I}_{max} (A) ²	Dimensions WxHxD (mm)	Weight kg
NXL 0016 5	5.5	12	21	128x292x190	5
NXL 0023 5	7.5	15	25	144x391x214	8.1
NXL 0031 5	11	25	38	144x391x214	8.1
NXL 0038 5	15	40	69	195x519x237	18.5

* These values do not have any connection with other Vacon catalogues

(1) Max. continuous output current for elevator duty cycle
 (2) The I_{max} allowed in the case of the root mean squared current in cycle operation is 80 % of the I_n

- Rating at 8 kHz switching frequency, 50 % ED.
- Peak current at acceleration time 200 % / 3 sec.
- Max. temperature 40°C

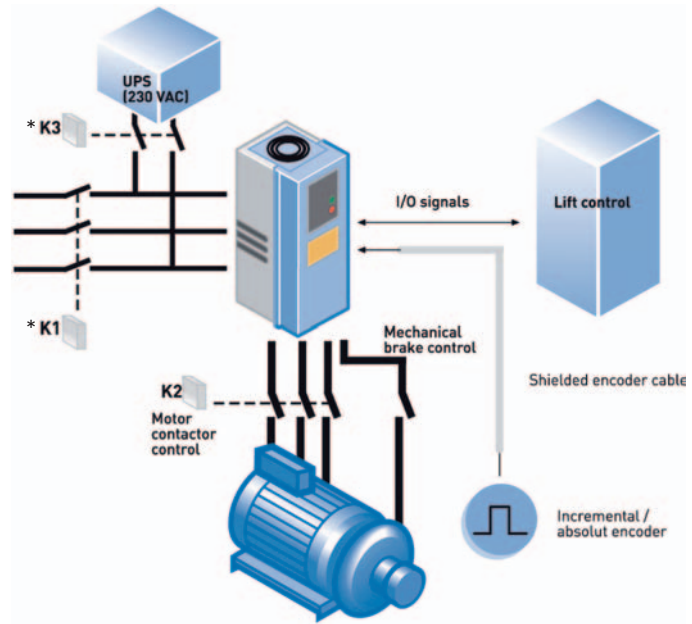
For NXL option boards, please refer to the Vacon NXL brochure.



APPLICATIONS AND PC TOOLS

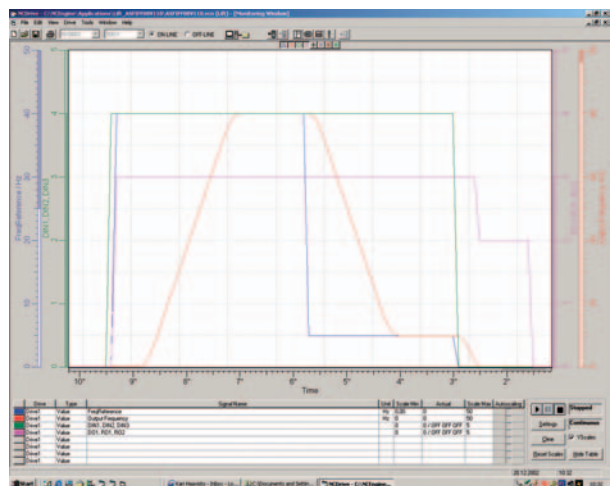
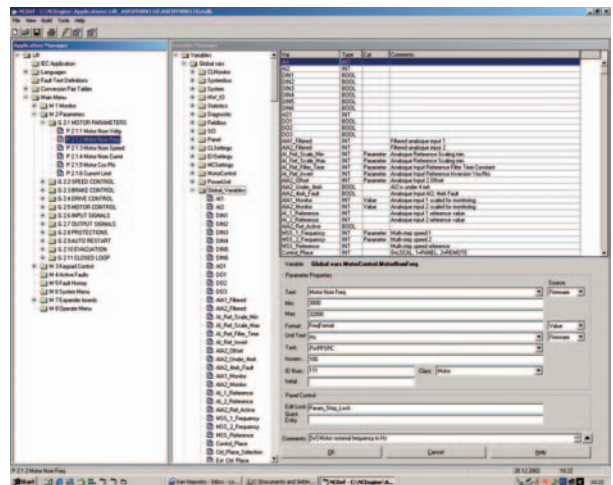
The I/O connections for elevator applications are designed for easy commissioning. The Vacon AC drives use a standard I/O configuration (OPT-AA is required for Vacon NXL). All I/Os are fully programmable. An incremental encoder (OPT-A4/A5) is needed for CL solutions and an absolute encoder (OPT-BE/AK) is needed for permanent magnet motors. Evacuation is based on a 230 V UPS system.

*controlled by the lift controller



- Easy commissioning and maintenance
- Save and copy parameters
- Monitoring function
 - 1 ms scan time by CAN bus for Vacon NXP
 - 50 ms RS 232 for Vacon NXL
- Diagnostic function
 - The last 30 faults can be viewed
- Datalogger function*
 - Data logged in the drive for 8 signals with a minimum sample time of 1 ms.
 - Data stored over the power off
- Trend recorder function*
 - The data can be saved continuously for longer periods
 - The saved trend data can be opened any time in graphical format and scrolled through the time axis

*Vacon NXP only





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