




**VACON NXL**  
**THE EASY AND IMPRESSIVE AC DRIVE**


**VACON**


DRIVEN BY DRIVES

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## EASY TO PLUG, AND EASIEST TO PLAY

The Vacon NXL is a powerful and compact AC drive for industrial and residential purposes in the power range from 0.25 to 30 kW. The space-saving bookshelf design with high protection classes, versatile control and programming capabilities offer an optimal solution for all operating environments. Installation, connection and commissioning procedures are extremely quick and convenient with instructions attached to the unit.

Thanks to an extremely effective design, everything is included as standard. The units can be installed on the wall without additional cabinets because of high protection classes. The RFI filters and brake choppers are always integrated. The standard units fit almost everywhere in both industrial and residential areas. The integrated choke reduces the stress on supply transformers, cables and fuses.

### Convenient installation and programming

The installation and programming is extremely quick and convenient with the help of the credit-card-size Quick Guide. The programming is often just a selection of load type and fine-tuning of the motor nominal current and speed.

Although the Vacon NXL is simple in construction compared to other Vacon NX ranges, it is the most flexible drive in its class. The flexibility means a wide range of control possibilities, programmable features, installation possibilities and modularity. The easy-to-use PC tools can be used e.g. for programming and parameter copying. Sometimes it is possible to remove the PLC from the system by adding logic to the drive with the NC61131-3 PC tool.

The double rating of the Vacon NXL and dynamic open loop vector control make the NXL a perfect choice for all kinds of loads, from simple pumps and fans to demanding material handling applications.

The motor noise level is extremely low because of a high switching frequency and a near-sinusoidal current waveform.

### More features, more performance

- No additional cabinets required
- Everything integrated as standard (dust/water protection, RFI filter, AC choke, brake chopper)
- Easy to install, easy to use
- Low noise (both drive and motor)
- Large amount of control possibilities (via I/Os, field buses or display panel)
- Large amount of features (e.g. fully programmable I/O, auto-identification, PID controller, flying start)
- High performance

### VACON NXL MF4-MF6, IP21



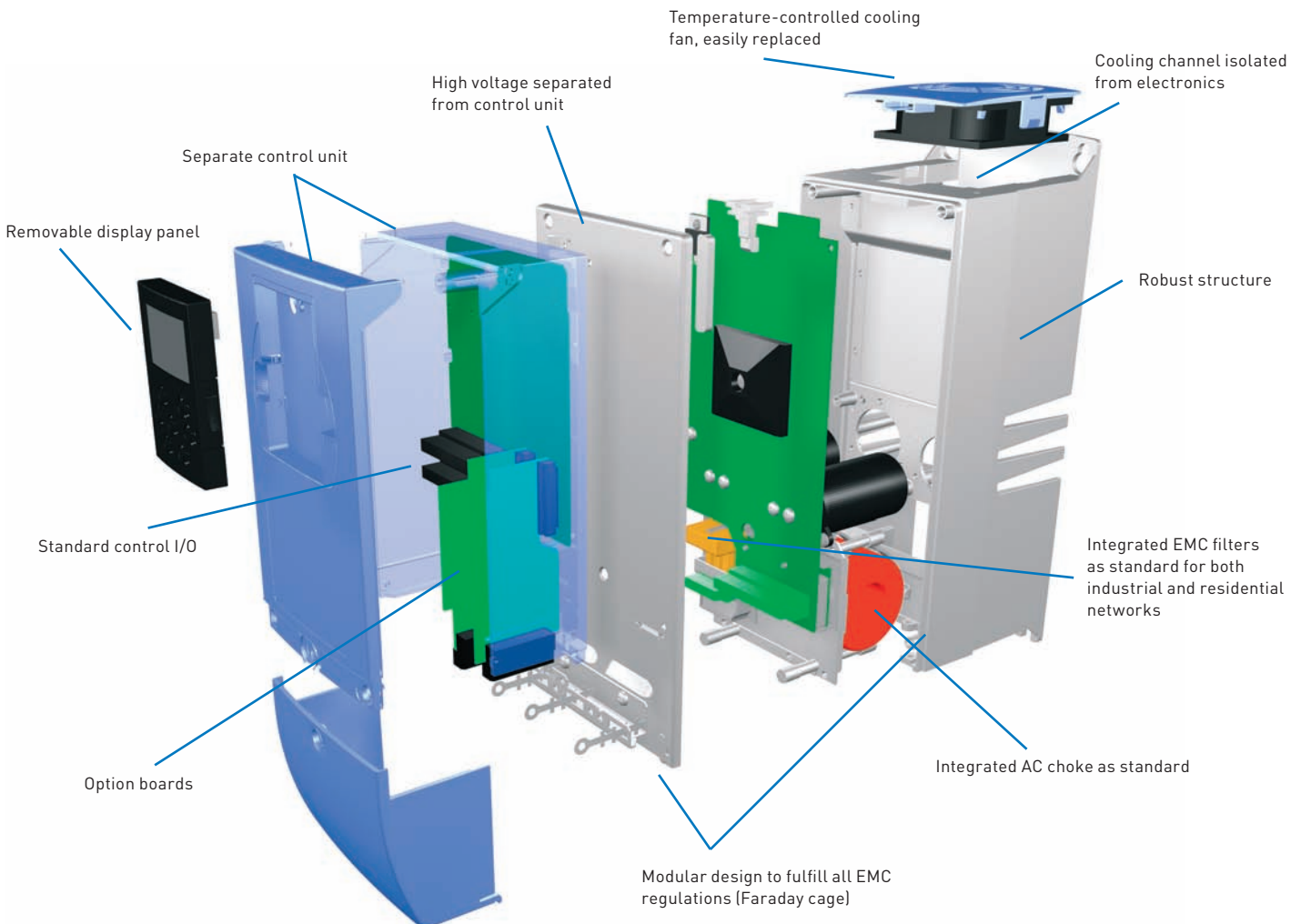
### VACON NXL MF4-MF6, IP54



The mechanical design is extremely compact. The IP54 units in particular are the smallest AC drives on the market. All units are suitable for both wall and enclosure mounting with all necessary components: integrated EMC filters, AC chokes, cable protection, dust and water protection. The effective super-cooling principle allows high ambient temperatures and high switching frequencies without derating.

Motor nominal values		
Voltage U (V)	Power High overload P <sub>H</sub> (kW)	Power Low overload P <sub>L</sub> (kW)
400	0.75...4	1.1...5.5
500	1.1...5.5	1.5...7.5
400	5.5...11	7.5...15
500	7.5...15	11...18.5
400	15...22	18.5...30
500	18.5...30	22...37

Vacon NXL features								
Supply voltage U (V)	EMC	Enclosure	Dimensions W x H x D (mm)	Weight (kg)	Integrated brake chopper	Integrated AC choke	Mechanical frame size	
380...500	H/T, C	IP21/IP54	128 x 292 x 190	5	standard	standard	<b>MF4</b>	
380...500	H/T, C	IP21/IP54	128 x 292 x 190	5	standard	standard	<b>MF4</b>	
380...500	H/T, C	IP21/IP54	144 x 391 x 214	8.1	standard	standard	<b>MF5</b>	
380...500	H/T, C	IP21/IP54	144 x 391 x 214	8.1	standard	standard	<b>MF5</b>	
380...500	H/T, C	IP21/IP54	195 x 519 x 237	18.5	standard	standard	<b>MF6</b>	
380...500	H/T, C	IP21/IP54	195 x 519 x 237	18.5	standard	standard	<b>MF6</b>	



## MF4-MF6 PRODUCT RANGE

Mains voltage 380—500 V, 50/60 Hz, 3~, enclosure class IP21/IP54, EMC level H

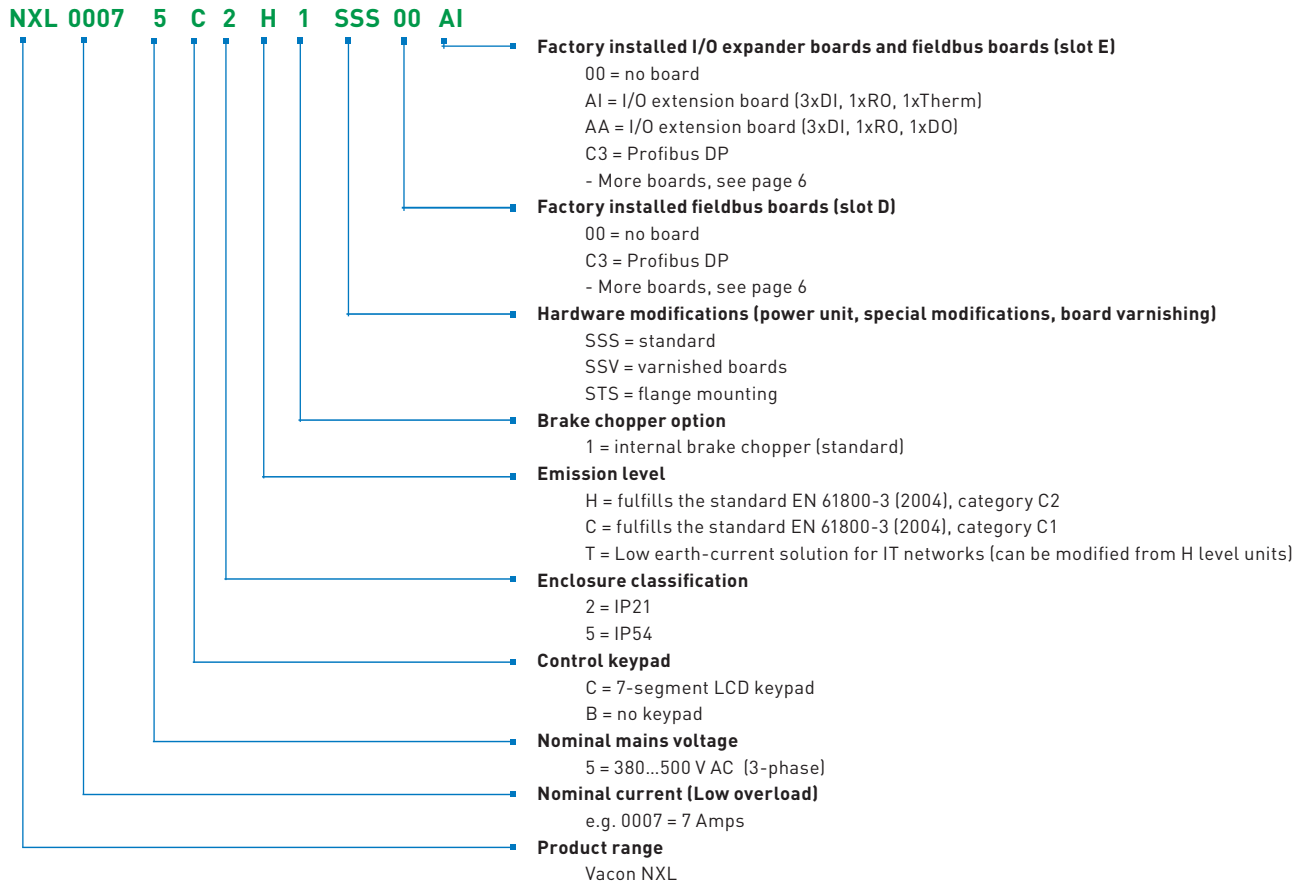
AC drive type *	Loadability					Motor shaft power		Frame size
	Low		High		Maximum current I <sub>S</sub>	400 V supply		
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload 40°C P (kW)	50% overload 50°C P (kW)	
NXL 0003 5 C 2 H 1	3.3	3.6	2.2	3.3	4.4	1.1	0.75	MF4
NXL 0004 5 C 2 H 1	4.3	4.7	3.3	5.0	6.2	1.5	1.1	MF4
NXL 0005 5 C 2 H 1	5.6	6.2	4.3	6.5	8.6	2.2	1.5	MF4
NXL 0007 5 C 2 H 1	7.6	8.4	5.6	8.4	10.8	3	2.2	MF4
NXL 0009 5 C 2 H 1	9	9.9	7.6	11.4	14	4	3	MF4
NXL 0012 5 C 2 H 1	12	13.2	9	13.5	18	5.5	4	MF4
NXL 0016 5 C 2 H 1	16	17.6	12	18.0	24	7.5	5.5	MF5
NXL 0023 5 C 2 H 1	23	25.3	16	24.0	32	11	7.5	MF5
NXL 0031 5 C 2 H 1	31	34	23	35	46	15	11	MF5
NXL 0038 5 C 2 H 1	38	42	31	47	62	18.5	15	MF6
NXL 0046 5 C 2 H 1	46	51	38	57	76	22	18.5	MF6
NXL 0061 5 C 2 H 1	61	67	46	69	92	30	22	MF6

\* Type code of the IP21 unit. The type code of the IP54 unit: replace '2' with '5'; for example, NXL 0003 5C5H1

For all Vacon NXL drives, overloadability is defined as follows:

High: 1.5 x I<sub>H</sub> (1 min/10 min) at 50°C; Low: 1.1 x I<sub>L</sub> (1 min/10 min) at 40°C; I<sub>S</sub> for 2 seconds every 20 seconds.

## VACON NXL MF4-MF6 TYPE DESIGNATION CODE



**COMPACT YET SO POWERFUL**

The Vacon NXL range also offers compact, cabinet-mounted units for lower motor powers. Frames MF2 and MF3 are suitable for both 208–230 V and 380–500 V supply voltages for powers up to 2.2 kW. The compact size and flexible installation options make the Vacon NXL suitable for installations where space is at a premium. The standard control I/O can be extended with one I/O expander board or one fieldbus board.

**Features**

- Small size
- Flexible installation (back or side, screw or DIN rail)
- Easy to install and use
- Low noise
- Large amount of control possibilities (via I/Os, fieldbuses or display panel)
- Large amount of features (e.g. fully programmable I/O, auto-identification, PID controller, flying start)
- High performance
- RFI filters and AC chokes available as options



**Mains voltage 380—500 V, 50/60 Hz, 3~, enclosure class IP20, EMC level N**

AC drive type	Loadability					Motor shaft power		Frame size and dimensions (W x H x D)
	Low		High		Maximum current I <sub>S</sub>	400 V supply		
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload 40°C P (kW)	50% overload 50°C P (kW)	
NXL 0001 5 C 1 N 0	1.9	2.1	1.3	2.0	2.6	0.55	0.37	MF2 / 60 x 130 x 150
NXL 0002 5 C 1 N 0	2.4	2.6	1.9	2.9	3.8	0.75	0.55	MF2 / 60 x 130 x 150
NXL 0003 5 C 1 N 1	3.3	3.6	2.4	3.6	4.8	1.1	0.75	MF3 / 84 x 220 x 172
NXL 0004 5 C 1 N 1	4.3	4.7	3.3	5.0	6.6	1.5	1.1	MF3 / 84 x 220 x 172
NXL 0005 5 C 1 N 1	5.4	5.9	4.3	6.5	8.6	2.2	1.5	MF3 / 84 x 220 x 172

**Mains voltage 208—240 V, 50/60 Hz, 1/3~ (3~ motor), enclosure class IP20, EMC level N**

AC drive type	Loadability					Motor shaft power		Frame size and dimensions (W x H x D)
	Low		High		Maximum current I <sub>S</sub>	230 V supply		
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload 40°C P (kW)	50% overload 50°C P (kW)	
NXL 0002 2 C 1 N 0*	2.4	2.6	1.7	2.6	3.4	0.37	0.25	MF2 / 60 x 130 x 150
NXL 0003 2 C 1 N 1	3.7	4.1	2.8	4.2	5.6	0.75	0.55	MF3 / 84 x 220 x 172
NXL 0004 2 C 1 N 1	4.8	5.3	3.7	5.6	7.4	1.1	0.75	MF3 / 84 x 220 x 172
NXL 0006 2 C 1 N 1	6.6	7.2	4.8	7.2	9.6	1.5	1.1	MF3 / 84 x 220 x 172

\* suitable only for single-phase supply voltage (the rest suitable for both single-phase and three-phase supply voltages)

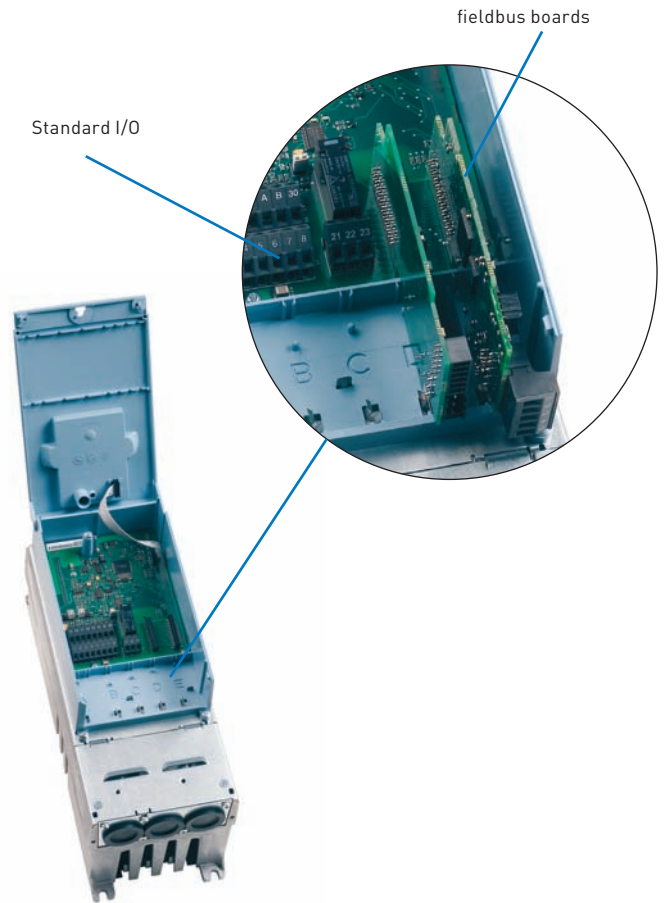
## VACON NXL CONTROL UNIT

The standard I/O of the Vacon NXL has been optimized for typical control requirements. In addition to digital and analog inputs and outputs, RS485 (Modbus RTU) is included as standard. All inputs and outputs of the standard I/O and option boards are freely programmable. Both Analog Inputs can be programmed for 0...10 V or 0(4)...20 mA signals. Analog Input can also be programmed as Digital Input.

The standard I/O can easily and cost-effectively be extended with OPT-AA or OPT-AI boards, if necessary. The OPT-AA is the most effective way to add one more Relay Output, and the OPT-AI is normally used when galvanically isolated motor thermistor connection is needed. These boards are installed in option board slot E.

It is also possible to control the Vacon NXL with various kinds of fieldbuses with OPT-C-type boards (see the table below). The I/O extension and fieldbus boards are the same for all Vacon NX products. The fieldbus boards can be installed in slot D or E.

There are a large number of OPT-B-type option boards available. The most typical boards are included in the table below. It is possible, for instance, to add three more output relays with OPT-B5, if necessary. The OPT-B-type boards are typically installed in slot E.



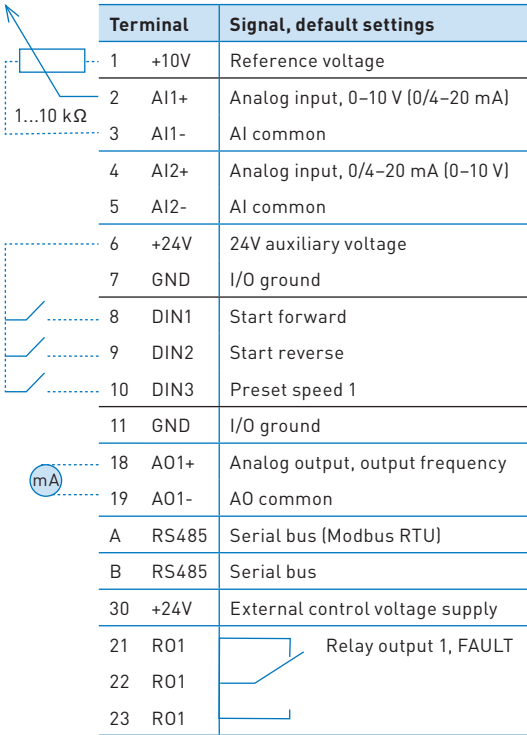
## VACON NXL OPTION BOARDS

Card typecode	Slot		I/O signal							NOTE
	D	E	DI	DO	AI mA isol.	AO mA isol.	RO NO NC	Therm	+24 EXT +24V	
<b>Basic I/O cards (OPT-A)</b>										
OPT-AA			3	1			1			
OPT-AI			3					1	1	
<b>I/O expander cards (OPT-B), typical</b>										
OPT-B2							1	1	1	
OPT-B4					1	2				1 analog signals galvanically isolated separately
OPT-B5								3		
<b>Fieldbus cards (OPT-C)</b>										
OPT-C2			RS-485 (Multiprotocol)							N2 (Modbus as standard)
OPT-C3			Profibus DP							
OPT-C4			LonWorks							
OPT-C5			Profibus DP (D9 type connector)							
OPT-C6			CANopen (slave)							
OPT-C7			DeviceNet							
OPT-C8			RS-485 (Multiprotocol, D9 type connector)							
OPT-CI			Modbus/TCP (Ethernet)							
OPT-CJ			BACnet							N2 (Modbus as standard)

NOTES: Allowed slots for the board are marked in blue. Allowed option board combinations are as follows:

## VACON NXL CONTROL I/O

### Standard I/O



Terminal	Signal, default settings
1 +10V	Reference voltage
2 AI1+	Analog input, 0-10 V (0/4-20 mA)
3 AI1-	AI common
4 AI2+	Analog input, 0/4-20 mA (0-10 V)
5 AI2-	AI common
6 +24V	24V auxiliary voltage
7 GND	I/O ground
8 DIN1	Start forward
9 DIN2	Start reverse
10 DIN3	Preset speed 1
11 GND	I/O ground
18 AO1+	Analog output, output frequency
19 AO1-	AO common
A RS485	Serial bus (Modbus RTU)
B RS485	Serial bus
30 +24V	External control voltage supply
21 R01	Relay output 1, FAULT
22 R01	
23 R01	

All inputs and outputs of the standard I/O and option boards are freely programmable.

### OPT-AA (typical option)

Terminal	Signal, default settings
1 +24V	24 V auxiliary voltage
2 GND	I/O ground
3 DIN1	Preset speed 2
4 DIN2	Fault reset
5 DIN3	Disable PID
6 DO1	Digital output, Ready
24 R01	Relay output 1, RUN
25 R01	
26 R01	

### OPT-AI (typical option)

Terminal	Signal, default settings
12 +24V	24 V auxiliary voltage
13 GND	I/O ground
14 DIN1	Preset speed 2
15 DIN2	Fault reset
16 DIN3	Disable PID
25 R01	Relay output 1, RUN
26 R01	
28 TI1+	Thermistor input
29 TI1-	[galvanically isolated]

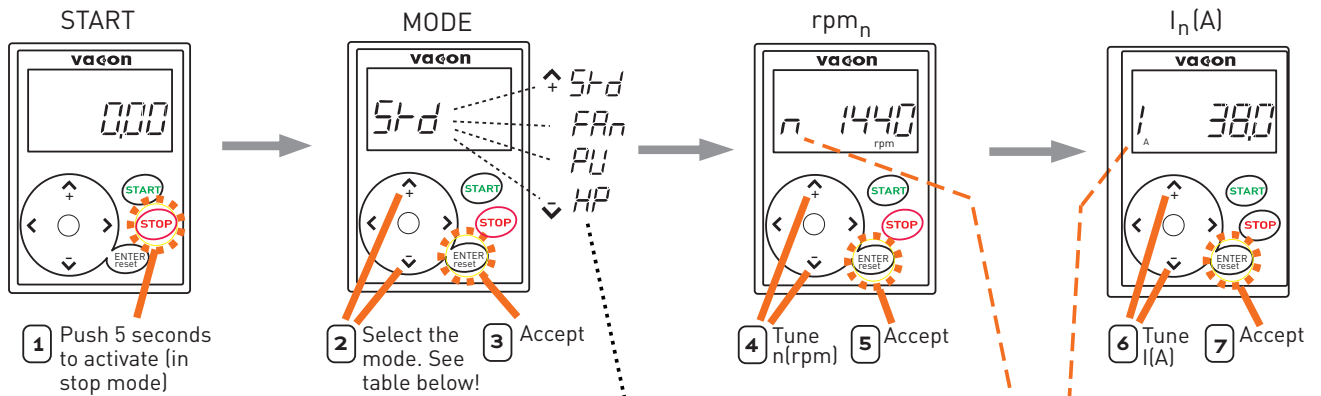
## OTHER TYPICAL OPTIONS

OPTION	ORDER TYPECODE	SUITABILITY	NOTE
IP54 enclosure	Factory option	MF4-MF6	Replace '2' by '5' in the type code, e.g. NXL00315C5H1 (SSS...)
	IP5-FR_	MF4-MF6	IP54 kit, e.g. IP5-FR4
Through-hole mounting	Factory option	MF4-MF6	E.g. NXL00315CTH1STS..., IP54 back, IP21 front, kits available
External brake resistors	BRR-0022-LD-5	00035-00225	LD = Light Duty: 5 sec nominal torque braking from nominal speed decreasing linearly to zero, once per 120 sec. HD = Heavy Duty: 3 sec nominal torque braking at nominal speed + 7 sec nominal torque braking from nominal speed decreasing linearly to zero, once per 120 sec. Replace LD by HD in the type code, e.g. BRR-0031-HD-5 The brake resistor manual is available for more precise selection
	BRR-0031-LD-5	00315	
	BRR-0045-LD-5	00385-00465	
	BRR-0061-LD-5	00615	
Panel door installation sets	DRA-02L	All	Door installation set with a 2-m RS232C cable
	DRA-04L		Door installation set with a 4-m RS232C cable
PC adapter	PAN-RS	All	Adapter PAN-RS and a RS232C cable are required for PC connection
RS232C cables	RS232C-2M	All	2-meter-long RS232C cable for PC connection
	RS232C-4M		4-meter-long RS232C cable for PC connection
Varnished circuit boards	Factory option	MF4-MF6	Replace the 'S' by 'V', e.g. NXL00315C5H1SSV...
C-level RFI filters	Factory option	MF4-MF6	Replace 'H' by 'C' in the typecode, e.g. NXL00315C2C1 (SSS...)
<b>OPTIONS FOR COMPACT UNITS (MF2-MF3)</b>			
RFI filters	RFI-0012-2-1	00022-00062	RFI filter for 208-230 V units, H level, 1~ supply
	RFI-0013-2-1	00022-00062	RFI filter for 208-230 V units, H level, 1~ supply, footprint installation
	RFI-0008-5-1	00015-00055	RFI filter for 380-500 V units, H level, footprint installation
DIN rail installation	Factory option	MF2-MF3	Replace 'S' by 'D' in the typecode, e.g. NXL 00025C1H0 SDS

## FIRST-CLASS USABILITY

The basic settings can be programmed by simply launching the Vacon NXL start-up wizard. Only four steps are required, and the drive is ready to run.

### START-UP WIZARD =Push the button

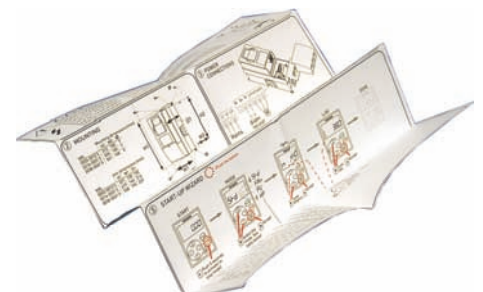


	P2.1.1 Min. Freq (Hz)	P2.1.2 Max.Freq (Hz)	P2.1.3 Acc time (s)	P2.1.4 Dec time (s)	P2.1.5 Current limit(A)	P2.1.6 Motor Un (V)	P2.1.7 Motor fn(Hz)	P2.1.11 Start funct.	P2.1.12 Stop funct.	P2.1.13 U/f optimization	P2.1.14 I/O ref	P2.1.21 Auto restart	P3.1 Control place
<b>Std</b> Standard	0 Hz	50 Hz	3 s	3 s	I <sub>H</sub> *1,5	400 V	50 Hz	0= Ramp	0= Coasting	0= Not used	0= Ai1 0-10V	0= Not used	I/O
<b>FAn</b> Fan	20 Hz	50 Hz	20 s	20 s	I <sub>L</sub> *1,1	400 V	50 Hz	0= Ramp	0= Coasting	0= Not used	0= Ai1 0-10V	0= Not used	I/O
<b>PU</b> Pump	20 Hz	50 Hz	5 s	5 s	I <sub>L</sub> *1,1	400 V	50 Hz	0= Ramp	1= Ramp	0= Not used	0= Ai1 0-10V	0= Not used	I/O
<b>HP</b> High performance	0 Hz	50 Hz	1 s	1 s	I <sub>H</sub> *1,8	400 V	50 Hz	0= Ramp	0= Coasting	1= automatic torque boost	0= Ai1 0-10V	0= Not used	I/O

For example: These settings are made automatically if the fan mode is selected.



The instructions to install, connect and program the Vacon NXL are included in the credit-card size Quick Guide attached to each unit.





## MULTI-CONTROL APPLICATION

The standard Multi-Control Application software of the Vacon NXL is extremely flexible and easy to use. All inputs and outputs are programmable, and there is a full set of features and possibilities for system or process control and protections.

The default settings are very close to optimum, and the drive operates accurately enough without any programming. It still is recommended to check and fine-tune the motor nominal values to optimize the performance and motor protection. Programming can be made simply by using the start-up wizard feature of the display panel, programming parameter by parameter with display panel, or programming by the NCDrive tool. The instructions, if required, can be found in the credit-card-size Quick Guide.

There are many parameters and features which can be utilized, if necessary. For example:

- PID controller
- Pump and fan control for a maximum of 4 parallel motors
- Flying start
- Auto-tuning
- Programming of all control inputs and outputs
- Output relay delays

In addition to the standard MultiControl Application software, some special application software is also available. It is even possible to make totally customer-specific software with the NC61131-3 Engineering tool, and remove the PLC by integrating the logic to the NXL software.

The Vacon PC tools are available for downloading from the Vacon website at <http://www.vacon.com>. These include:

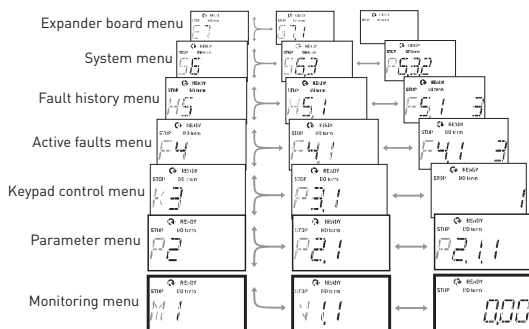
- Vacon NCDrive for parameter setting, copying, storing, printing, monitoring and controlling
- Vacon NCLoad for software updating and uploading special software to the drive
- Vacon NC61131-3 Engineering is available for making tailor-made software. (A license key and training required)

The following software applications are available for special requirements:

- Brake control
- Lift
- Multi-motor
- Sliding door
- Local/remote
- Fire mode
- Multi-purpose



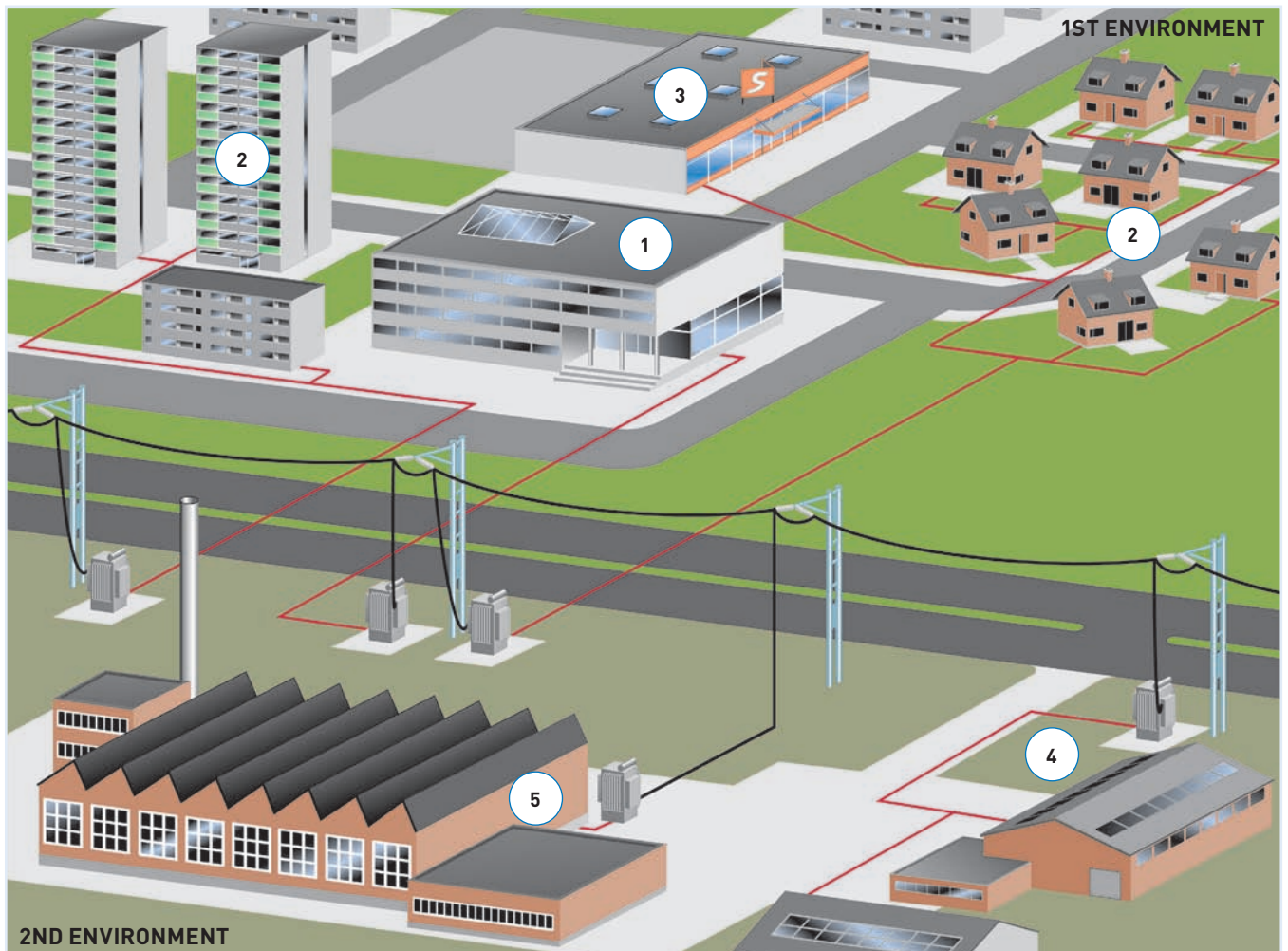
Navigation and selection keys



Activating the start-up wizard

Navigating the menu structure (e.g. special parameters, monitoring signals)

**EMC AND INSTALLATION ENVIRONMENT**



The product family standard EN61800-3 sets limits for both emissions and immunity of radio frequency disturbances. The environment has been divided into the 1st and 2nd environments, which, in practice, means public and industrial networks.

Radio Frequency Interference (RFI) filters are typically required to meet the EN61800-3 standard. These filters are integrated in the Vacon NXL MF4-MF6 as standard.

The Vacon NXL fulfills all the requirements of the 1st and 2nd environments (H level: EN61800-3 (2004), category C2). No additional RFI filters or cabinets are required for frames MF4-MF6.

The Vacon NXL MF4-MF6 units are also available with extremely low-emission integrated EMC filters (C level: EN61800-3 (2004), category C1; EN55011, class B). These filters are sometimes required in very sensitive locations such as hospitals.

**EMC Selection Table, restricted distribution**

	1	2	3	4	5	
Vacon NXL EMC	Hospital	Residential Area	Commercial	Light Industry Area	Heavy Industry	Marine
C	O					
H	R	R	R	O	O	
L				R	R	
T					R (IT Network)	R (IT Network)

R = Required ; O = Optional

## TECHNICAL DATA

<b>Mains connection</b>	Input voltage $U_{in}$	380...500 V, -10%...+10%, 208...240 V, -10%...+10%
	Input frequency	45...66 Hz
	Connection to mains	Once per minute or less (normal case)
<b>Motor connection</b>	Output voltage	0... $U_{in}$
	Continuous output current	High overloadability: $I_H$ , ambient temperature max. +50°C Low overloadability: $I_L$ , ambient temperature max. +40°C
	Overloadability	High: 1.5 x $I_H$ (1 min/10 min), Low: 1.1 x $I_L$ (1 min/10 min)
	Max. starting current	$I_S$ for 2 s every 20 s
	Output frequency	0...320 Hz
	Frequency resolution	0.01 Hz
<b>Control characteristics</b>	Control method	Frequency control U/f; Open Loop Vector Control
	Switching frequency	1...16 kHz; Factory default 6 kHz, (MF2, MF3: default 3,6 kHz)
	Field weakening point	8...320 Hz
	Acceleration time	0...3000 s
	Deceleration time	0...3000 s
	Braking	DC brake: 30% * $T_N$ (without brake resistor), flux braking
<b>Ambient conditions</b>	Ambient operating temperature	-10°C (no frost)...+50°C: $I_H$ -10°C (no frost)...+40°C: $I_L$
	Storage temperature	-40°C...+70°C
	Relative humidity	0 to 95% RH, non-condensing, non-corrosive, no dripping water
	Air quality: - chemical vapours - mechanical particles	IEC 721-3-3, unit in operation, class 3C2 IEC 721-3-3, unit in operation, class 3S2
	Altitude	100% load capacity (no derating) up to 1000 m 1% derating for each 100 m above 1000 m; max. 3000 m
	Vibration EN50178/EN60068-2-6	5...150 Hz Displacement amplitude 1 mm (peak) at 3...15.8 Hz Max acceleration amplitude 1 G at 15.8...150 Hz
	Shock EN50178, EN60068-2-27	UPS Drop Test (for applicable UPS weights) Storage and shipping: max 15 G, 11 ms (in package)
	Enclosure class	MF4-MF6: IP21 and IP54; MF2-MF3: IP20
<b>EMC</b>	Immunity	Fulfills all EMC immunity requirements
	Emissions	<b>MF4-MF6:</b> <b>EMC level H:</b> EN61800-3 (2004), category C2; EN61000-6-4, EN50081-2; EN55011 class A <b>EMC level C:</b> EN61800-3 (2004), category C1; EN61000-6-3, EN50081-1,-2; EN55011 class B <b>EMC level T:</b> Low earth-current solution suitable for IT networks (can be modified from H-level units)  <b>MF2-MF3:</b> <b>EMC level N:</b> EN61800-3 (2004), category C4 <b>EMC level H w/ RFI filter:</b> EN61800-3 (2004), category C2; EN61000-6-4, EN50081-2; EN55011 class A.
<b>Safety</b>		EN 50178 (1997), EN 60204-1 (1996), EN 60950 (2000, 3rd edition) (as relevant), IEC 61800-5, CE, UL, CUL; (see unit nameplate for more detailed approvals)
<b>Control connections</b> (values in brackets valid for OPT-AA or OPT-AI)	Analogue input voltage	0...+10 V, $R_i = 200 \text{ k}\Omega$ , resolution 0.1%, accuracy $\pm 1\%$
	Analogue input current	0(4)...20 mA, $R_i = 250 \Omega$ differential, resolution 0.1%, accuracy $\pm 1\%$
	Digital inputs	3 (6), 18...30 VDC
	Auxiliary voltage	+24 V, $\pm 15\%$ , max. 250mA (MF2-MF3: 100mA)
	Output reference voltage	+10 V, +3%, max. load 10 mA
	Analogue output	0(4)...20 mA; $R_L$ max. 500 $\Omega$ , resolution 10 bit, accuracy $\pm 2\%$
	Relay outputs	1 (2) programmable relay output(s) Switching capacity: 24 VDC/8 A, 250 VAC/8 A, 125 VDC/0.4 A. Min. switching load: 5 V/10 mA
	RS-485	Serial bus (Modbus RTU)
	Thermistor input	Galvanically isolated, $R_{trip} = 4.7 \text{ k}\Omega$ (OPT-AI)
<b>Protections</b>		Overvoltage, undervoltage, earth fault, motor phase supervision, overcurrent, unit overtemperature, motor overload, motor stall, motor underload, short-circuit of +24 V and +10 V reference voltages



## VACON NXS ROBUST DRIVE FOR HEAVY USE

# VACON

DRIVEN BY DRIVES

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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)

روبروی پالایشگاه نفت پارس، پلاک ۱۲

## THE RELIABLE CHOICE

The Vacon NXS is a compact AC drive in the power range of 0.37—560 kW and supply voltages of 208—690 V for heavy use in machines, buildings and all branches of industry.

The robust design incorporates effective protection against supply network disturbances. Trip-free operation is also guaranteed due to sophisticated motor control principles and motor/drive protection features, component selection and effective cooling.

Enclosure classes of IP21 and IP54 and integrated high-level EMC filters make the Vacon NXS suitable for all environments.

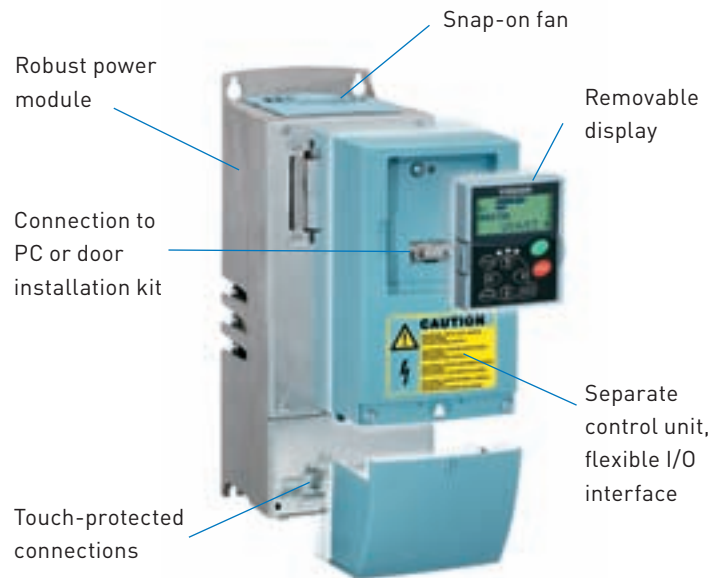
The Start-Up Wizard and the standard All-In-One Application Package make parameter setting extremely easy in all cases, from simple to complex.

The wide and flexible standard I/O and option for five I/O boards provide versatile controllability. The most common fieldbus options are also available.

The modular design of the Vacon NXS brings several advantages: the control terminals are safely separated from power terminals, upgrading the control inputs and outputs is easy and convenient, replacing the cooling fan (the only regularly replaceable component) is fast, the display panel can be utilized for parameter copying, etc.

### Features

- Easy to use display panel
- Interactive programming with Start-Up Wizard
- Versatile All-in-One Package
- PID controller and PFC for 1-5 pumps
- Special applications available (water application package, high speed, etc.)
- Five slots for control boards (2 basic boards and 3 option boards)
- High switching frequency, low noise
- Steady state speed error < 1%
- Low torque ripple
- Starting torque > 200%, depending on AC drive sizing
- Suitable for multi-motor applications



### VACON NXS IP21



## DESIGN & DIMENSIONS

The mechanical design is extremely compact. The IP54 units in particular are the smallest AC drives on the market. All units are suitable for both wall and enclosure mounting with all necessary components: integrated EMC filters, AC chokes, cable protection, dust and water protection. The effective super-cooling principle allows high ambient temperatures and high switching frequencies without derating.

### Mains voltage 380—500 V, 50/60 Hz, 3~, Wall-mounted units

AC drive type	Loadability					Motor shaft power		Frame size	Dimensions W*H*D (mm)
	Low (+40°C)		High (+50°C)		Maximum current I <sub>s</sub>	400 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overl. P (kW)	50% overl. P (kW)		
NXS 0003 5 A 2 H 1 SSS	3.3	3.6	2.2	3.3	4.4	1.1	0.75	FR4	128*292*190
NXS 0004 5 A 2 H 1 SSS	4.3	4.7	3.3	5.0	6.2	1.5	1.1	FR4	128*292*190
NXS 0005 5 A 2 H 1 SSS	5.6	6.2	4.3	6.5	8.6	2.2	1.5	FR4	128*292*190
NXS 0007 5 A 2 H 1 SSS	7.6	8.4	5.6	8.4	10.8	3	2.2	FR4	128*292*190
NXS 0009 5 A 2 H 1 SSS	9	9.9	7.6	11.4	14	4	3	FR4	128*292*190
NXS 0012 5 A 2 H 1 SSS	12	13.2	9	13.5	18	5.5	4	FR4	128*292*190
NXS 0016 5 A 2 H 1 SSS	16	17.6	12	18.0	24	7.5	5.5	FR5	144*391*214
NXS 0022 5 A 2 H 1 SSS	23	25.3	16	24.0	32	11	7.5	FR5	144*391*214
NXS 0031 5 A 2 H 1 SSS	31	34	23	35	46	15	11	FR5	144*391*214
NXS 0038 5 A 2 H 1 SSS	38	42	31	47	62	18.5	15	FR6	195*519*237
NXS 0045 5 A 2 H 1 SSS	46	51	38	57	76	22	18.5	FR6	195*519*237
NXS 0061 5 A 2 H 1 SSS	61	67	46	69	92	30	22	FR6	195*519*237
NXS 0072 5 A 2 H 0 SSS	72	79	61	92	122	37	30	FR7	237*591*257
NXS 0087 5 A 2 H 0 SSS	87	96	72	108	144	45	37	FR7	237*591*257
NXS 0105 5 A 2 H 0 SSS	105	116	87	131	174	55	45	FR7	237*591*257
NXS 0140 5 A 2 H 0 SSS	140	154	105	158	210	75	55	FR8	291*758*344
NXS 0168 5 A 2 H 0 SSS	170	187	140	210	280	90	75	FR8	291*758*344
NXS 0205 5 A 2 H 0 SSS	205	226	170	255	336	110	90	FR8	291*758*344
NXS 0261 5 A 2 H 0 SSF	261	287	205	308	349	132	110	FR9	480*1150*362
NXS 0300 5 A 2 H 0 SSF	300	330	245	368	444	160	132	FR9	480*1150*362

### Mains voltage 380—500 V, 50/60 Hz, 3~, Standalone units

AC drive type	Loadability					Motor shaft power		Frame size	Dimensions W*H*D (mm)
	Low (+40°C)		High (+40°C)		Maximum current I <sub>s</sub>	400 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
NXS 0385 5 A 2 L 0 SSA	385	424	300	450	540	200	160	FR10	595*2020*602
NXS 0460 5 A 2 L 0 SSA	460	506	385	578	693	250	200	FR10	595*2020*602
NXS 0520 5 A 2 L 0 SSA	520	572	460	690	828	250	250	FR10	595*2020*602
NXS 0590 5 A 2 L 0 SSA	590	649	520	780	936	315	250	FR11	794*2020*602
NXS 0650 5 A 2 L 0 SSA	650	715	590	885	1062	355	315	FR11	794*2020*602
NXS 0730 5 A 2 L 0 SSA	730	803	650	975	1170	400	355	FR11	794*2020*602

### VACON NXS IP54



FR4

FR5

FR6

FR7

FR8

FR9

## PRODUCT RANGE

### Mains voltage 525—690 V, 50/60 Hz, 3~, Wall-mounted units

AC drive type	Loadability					Motor shaft power			Frame size	Dimensions W*H*D (mm)
	Low (+40°C)		High (+50°C)		Maximum current I <sub>s</sub>	690 V supply				
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overl. P (kW)	50% overl. P (kW)			
NXS 0004 6A2L0SSS	4.5	5.0	3.2	4.8	6.4	3	2.2	FR6	195*519*237	
NXS 0005 6A2L0SSS	5.5	6.1	4.5	6.8	9.0	4	3	FR6	195*519*237	
NXS 0007 6A2L0SSS	7.5	8.3	5.5	8.3	11.0	5.5	4	FR6	195*519*237	
NXS 0010 6A2L0SSS	10	11.0	7.5	11.3	15.0	7.5	5.5	FR6	195*519*237	
NXS 0013 6A2L0SSS	13.5	14.9	10	15.0	20.0	11	7.5	FR6	195*519*237	
NXS 0018 6A2L0SSS	18	19.8	13.5	20.3	27	15	11	FR6	195*519*237	
NXS 0022 6A2L0SSS	22	24.2	18	27.0	36	18.5	15	FR6	195*519*237	
NXS 0027 6A2L0SSS	27	29.7	22	33.0	44	22	18.5	FR6	195*519*237	
NXS 0034 6A2L0SSS	34	37	27	41	54	30	22	FR6	195*519*237	
NXS 0041 6A2L0SSS	41	45	34	51	68	37.5	30	FR7	237*591*257	
NXS 0052 6A2L0SSS	52	57	41	62	82	45	37.5	FR7	237*591*257	
NXS 0062 6A2L0SSS	62	68	52	78	104	55	45	FR8	291*758*344	
NXS 0080 6A2L0SSS	80	88	62	93	124	75	55	FR8	291*758*344	
NXS 0100 6A2L0SSS	100	110	80	120	160	90	75	FR8	291*758*344	
NXS 0125 6A2L0SSF	125	138	100	150	200	110	90	FR9	480*1150*362	
NXS 0144 6A2L0SSF	144	158	125	188	213	132	110	FR9	480*1150*362	
NXS 0170 6A2L0SSF	170	187	144	216	245	160	132	FR9	480*1150*362	
NXS 0208 6A2L0SSF	208	229	170	255	289	200	160	FR9	480*1150*362	

For all Vacon NXS drives, overloadability is defined as follows:

High: 1.5 x I<sub>H</sub> (1 min/10 min) @ 50°C; Low: 1.1 x I<sub>L</sub> (1 min/10 min) @ 40°C; I<sub>s</sub> for 2 sec every 20 sec.

### Mains voltage 525—690 V, 50/60 Hz, 3~, Standalone units

AC drive type	Loadability					Motor shaft power			Frame size	Dimensions W*H*D (mm)
	Low (+40°C)		High (+40°C)		Maximum current I <sub>s</sub>	690 V supply				
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)			
NXS 0261 6A2L0SSA	261	287	208	312	375	250	200	FR10	595*2020*602	
NXS 0325 6A2L0SSA	325	358	261	392	470	315	250	FR10	595*2020*602	
NXS 0385 6A2L0SSA	385	424	325	488	585	355	315	FR10	595*2020*602	
NXS 0416 6A2L0SSA*	416	458	325	488	585	400	315	FR10	595*2020*602	
NXS 0460 6A2L0SSA	460	506	385	578	693	450	355	FR11	794*2020*602	
NXS 0502 6A2L0SSA	502	552	460	690	828	500	450	FR11	794*2020*602	
NXS 0590 6A2L0SSA*	590	649	502	753	904	560	500	FR11	794*2020*602	

\* max. ambient temperature of +35°C

### Hardware configurations, Standalone units

FUNCTION	AVAILABILITY
IP21	Standard
IP54 (FR10 only)	Optional (H: +20mm)
Integrated fuses	Standard
Integrated load switch	Optional
EMC filtering L	Standard
EMC filtering T	Optional
Integrated brake chopper (cabling top entry)	Optional (H: +122 mm)



ED10

ED11

تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)

روبروی پالایشگاه نفت پارس، پلاک ۱۲

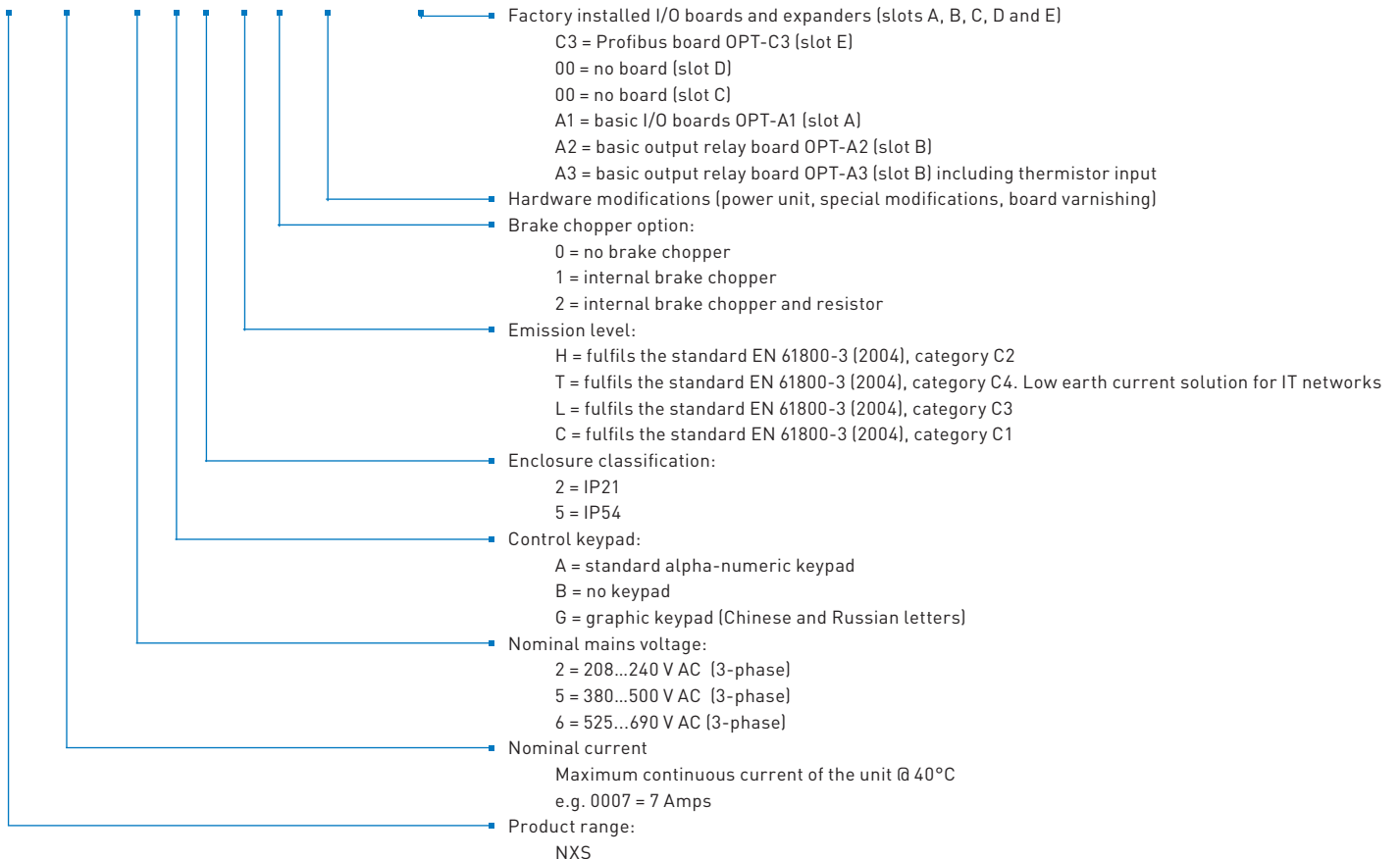
## PRODUCT RANGE

### Mains voltage 208—240 V, 50/60 Hz, 3~, Wall-mounted units

AC drive type	Loadability					Motor shaft power		Frame size	Dimensions W*H*D (mm)
	Low (+40°C)		High (+50°C)		Maximum current I <sub>s</sub>	230 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overl. P (kW)	50% overl. P (kW)		
NXS 0004 2 A 2 H 1 SSS	4.8	5.3	3.7	5.6	7.4	0.75	0.55	FR4	128*292*190
NXS 0007 2 A 2 H 1 SSS	6.6	7.3	4.8	7.2	9.6	1.1	0.75	FR4	128*292*190
NXS 0008 2 A 2 H 1 SSS	7.8	8.6	6.6	9.9	13.2	1.5	1.1	FR4	128*292*190
NXS 0011 2 A 2 H 1 SSS	11	12.1	7.8	11.7	15.6	2.2	1.5	FR4	128*292*190
NXS 0012 2 A 2 H 1 SSS	12.5	13.8	11	16.5	22	3	2.2	FR4	128*292*190
NXS 0017 2 A 2 H 1 SSS	17.5	19.3	12.5	18.8	25	4	3	FR5	144*391*214
NXS 0025 2 A 2 H 1 SSS	25	27.5	17.5	26.3	35	5.5	4	FR5	144*391*214
NXS 0031 2 A 2 H 1 SSS	31	34.1	25	37.5	50	7.5	5.5	FR5	144*391*214
NXS 0048 2 A 2 H 1 SSS	48	52.8	31	46.5	62	11	7.5	FR6	195*519*237
NXS 0061 2 A 2 H 1 SSS	61	67.1	48	72.0	96	15	11	FR6	195*519*237
NXS 0075 2 A 2 H 0 SSS	75	83	61	92	122	18.5	15	FR7	237*591*257
NXS 0088 2 A 2 H 0 SSS	88	97	75	113	150	22	18.5	FR7	237*591*257
NXS 0114 2 A 2 H 0 SSS	114	125	88	132	176	30	22	FR7	237*591*257
NXS 0140 2 A 2 H 0 SSS	140	154	105	158	210	37	30	FR8	291*758*344
NXS 0170 2 A 2 H 0 SSS	170	187	140	210	280	45	37	FR8	291*758*344
NXS 0205 2 A 2 H 0 SSS	205	226	170	255	336	55	45	FR8	291*758*344
NXS 0261 2 A 2 H 0 SSF	261	287	205	308	349	75	55	FR9	480*1150*362
NXS 0300 2 A 2 H 0 SSF	300	330	245	368	444	90	75	FR9	480*1150*362

## VACON NXS TYPE DESIGNATION CODE

### NXS 0007 5 A 2 H 1 SSS A1A20000C3





## VACON NXS CONTROL UNIT

There are no fixed inputs or outputs in the Vacon NXS. There are five slots (A, B, C, D and E) for I/O boards, and a suitable board can be selected for each slot (see the table below).

The NXS units are delivered with OPT-A1 and OPT-A2 boards if the I/O is not specified. In many countries, boards OPT-A1 and OPT-A3 are used as standard I/O as the galvanically isolated thermistor input is often required.

Removable terminals, snap-in card installation, automatic card identification and instructions on the drive help making quick connections. If necessary, the inputs, outputs and fieldbus boards can be added in the field. The Vacon NXS is simply the most flexible frequency converter series on the market.

An external +24 V supply option enables communication with the control unit even if the mains supply is switched off (e.g. fieldbus communication and parameter settings).



## VACON OPTION BOARDS

Card type/code	Card slot					I / O signal														NOTE	
	A	B	C	D	E	DI	DO	DI DO	AI mA ±V	AI mA isol.	AO mA V	AO mA isol.	RO NO NC	RO NO	+10V ref	Therm	+24 EXT +24V	Pt100	42-240 VAC input		
<b>Basic I/O cards (OPT-A)</b>																					
OPT-A1						6	1		2		1				1		2				
OPT-A2													2								
OPT-A3													1	1		1					
OPT-A8						6	1		2		1				1		2			1)	
OPT-A9						6	1		2		1				1		2			2,5 mm <sup>2</sup> terminals	
<b>I/O expander cards (OPT-B)</b>																					
OPT-B1								6									1			Selectable DI/DO	
OPT-B2													1	1		1					
OPT-B4									1		2						1			2)	
OPT-B5														3							
OPT-B8																	1	3			
OPT-B9														1						5	
<b>Fieldbus cards (OPT-C)</b>																					
OPT-C2																				RS-485 (Multiprotocol)	Modbus, N2
OPT-C3																				Profibus DP	
OPT-C4																				LonWorks	Modbus, N2
OPT-C5																				Profibus DP (D9 type connector)	
OPT-C6																				CANopen (slave)	
OPT-C7																				DeviceNet	
OPT-C8																				RS-485 (Multiprotocol, D9 type connector)	
OPT-CI																				Modbus/TCP	
OPT-CJ																				BACnet	

NOTES: Allowed slots for the board are marked in blue.

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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)

روبروی پالایشگاه نفت پارس، پلاک ۱۲

## VACON NXS STANDARD I/O

### OPT-A1

Terminal	Defaults settings	Programmable
1 +10V	Reference voltage	
2 AI1+	Frequency reference 0-10 V	-10-+10 V, 0/4-20 mA
3 AI1-	AI common (GND)	Differential
4 AI2+	Frequency reference 4-20 mA	0-20mA, 0/-10V-10 V
5 AI2-	AI common (differential)	GND
6 +24V	Control supply (bidirectional)	
7 GND	I/O Ground	
8 DIN1	Start forward	Many possibilities
9 DIN2	Start reverse	Many possibilities
10 DIN3	External fault input	Many possibilities
11 CMA	Common for DIN1 - DIN3 (GND)	Floating
12 +24V	Control supply (bidirectional)	
13 GND	I/O Ground	
14 DIN4	Multi-step speed select 1	Many possibilities
15 DIN5	Multi-step speed select 2	Many possibilities
16 DIN6	Fault reset	Many possibilities
17 CMB	Common for DIN4 - DIN6 (GND)	Floating
18 AO1+	Output frequency (0-20 mA)	Many possibilities
19 AO1-	AO common (GND)	4-20 mA, 0-10 V
20 DO1	READY, I ≤ 50 mA, U ≤ 48 VDC	Many possibilities

### OPT-A2

Terminal	Defaults settings	Programmable
21 R01		
22 R01		RUN
23 R01		
24 R02		
25 R02		FAULT
26 R02		

### OPT-A3 (alternative)

Terminal	Defaults settings	Programmable
21 R01		
22 R01		RUN
23 R01		
25 R02		FAULT
26 R02		
28 T11+	Thermistor	Warning, fault,
29 T11-	input fault	no response

Default settings of OPT-A1, OPT-A2 and OPT-A3 for the Basic and Standard Applications.

## OTHER TYPICAL OPTIONS

OPTION	ORDER TYPECODE	AVAILABILITY	NOTE
IP54 enclosure	Factory option	All	Replace '2' by '5' in the type code, e.g. NXS02605A5H0 (SSS...)
	IP5-FR_	FR4, FR5, FR6	IP54 kit, e.g. IP5-FR4
Through-hole mounting	Factory option	FR4-FR9	E.g. NXS02605ATH0STS..., IP54 back, IP21 front, kits available
Integrated brake choppers	Standard	FR4-6/230, 500 V	E.g. NXS00455A2H1 (SSS...)
	Factory option	FR7-, FR6-/690 V	E.g. NXS02605A2H1 (SSS...)
External brake resistors (380 - 500 V range)	BRR-0022-LD-5	00035-00225	LD = Light duty: 5 sec nominal torque braking from nominal speed decreasing linearly to zero, once per 120 sec. HD = Heavy duty: 3 sec nominal torque braking at nominal speed + 7 sec nominal torque braking from nominal speed decreasing linearly to zero, once per 120 sec. Replace LD by HD in the type code, e.g. BRR-0105-HD-5 Brake resistors are also available for 208-240 V and 525-690 V NXS drives The brake resistor manual is available for more precise selection
	BRR-0031-LD-5	00315	
	BRR-0045-LD-5	00385-00455	
	BRR-0061-LD-5	00615	
	BRR-0105-LD-5	00725-01055	
BRR-0300-LD-5	01405-03005		
Integrated brake resistors	Factory option	FR4-6/500 V	Replace '1' by '2' in the typecode, e.g. NXS00455A2H2 (SSS...) Light duty: 2 sec nominal torque braking from nominal speed decreasing linearly to zero, once per 60 sec.
Graphical display panel	Factory option	All	Replace 'A' by 'G', e.g. NXS00455G2H1 (SSS...), supports Chinese & Russian
	PAN-G	All	Order typecode when ordered separately
Panel door installation sets	DRA-02B (-04B, -15B)	All	Length of RS232C cable is specified in the typecode, e.g. DRA-02B includes 2-meter RS232C cable
Varnished circuit boards	Factory option	All	Frame sizes FR4-FR8: replace the 'S' by 'V', e.g. NXS00455A2H1SSV..., frame size FR9-FR11: replace 'S' by 'G'
C-level RFI filters	Factory option	FR4-6/500 V	Replace 'H' by 'C' in the typecode, e.g. NXS00455A5C1 (SSS...)
Du/dt & sinus filters			Available for all drives, contact local Vacon supplier

## FIRST-CLASS USABILITY



The uncluttered text display panel with a well-defined menu structure and functions such as automatic parameter copy and start-up wizard makes commissioning and fine-tuning as easy as possible.



A maximum of three values can be monitored simultaneously (the multi-monitoring feature).

The Vacon PC tools are available for downloading from the Vacon website at <http://www.vacon.com>. These include:

- Vacon NCDrive for parameter setting, copying, storing, printing, monitoring and controlling
- Vacon NCLoad for software updating and uploading special software to the drive
- Vacon NC61131-3 Engineering is available for making tailor-made software. A license key and training required.

The Vacon PC tools require only an RS232C cable for communication with the drive (no adapters etc. required).

### Basic

I/O	Defaults	
A11	fref	P
A12	fref	P
D11	Start forward	
D12	Start reverse	
D13	External fault	P
D14	Speed select 1	
D15	Speed select 2	
D16	Fault reset	
A01	fout	P
D01	Ready	
R01	Run	
R02	Fault	

Suitable for most purposes

### Standard

I/O	Defaults	
A11	fref	P
A12	fref	P
D11	Start forward	P
D12	Start reverse	P
D13	External fault	P
D14	Speed select 1	
D15	Speed select 2	
D16	Fault reset	
A01	fout	P
D01	Ready	P
R01	Run	P
R02	Fault	P

Basic, with more programming possibilities

### Local/Remote

I/O	Defaults	
A11	B fref	P
A12	A fref	P
D11	A Start forward	P
D12	A Start reverse	P
D13	External fault	P
D14	B Start forward	P
D15	B Start reverse	P
D16	A/B selection	
A01	fout	P
D01	Ready	P
R01	Run	P
R02	Fault	P

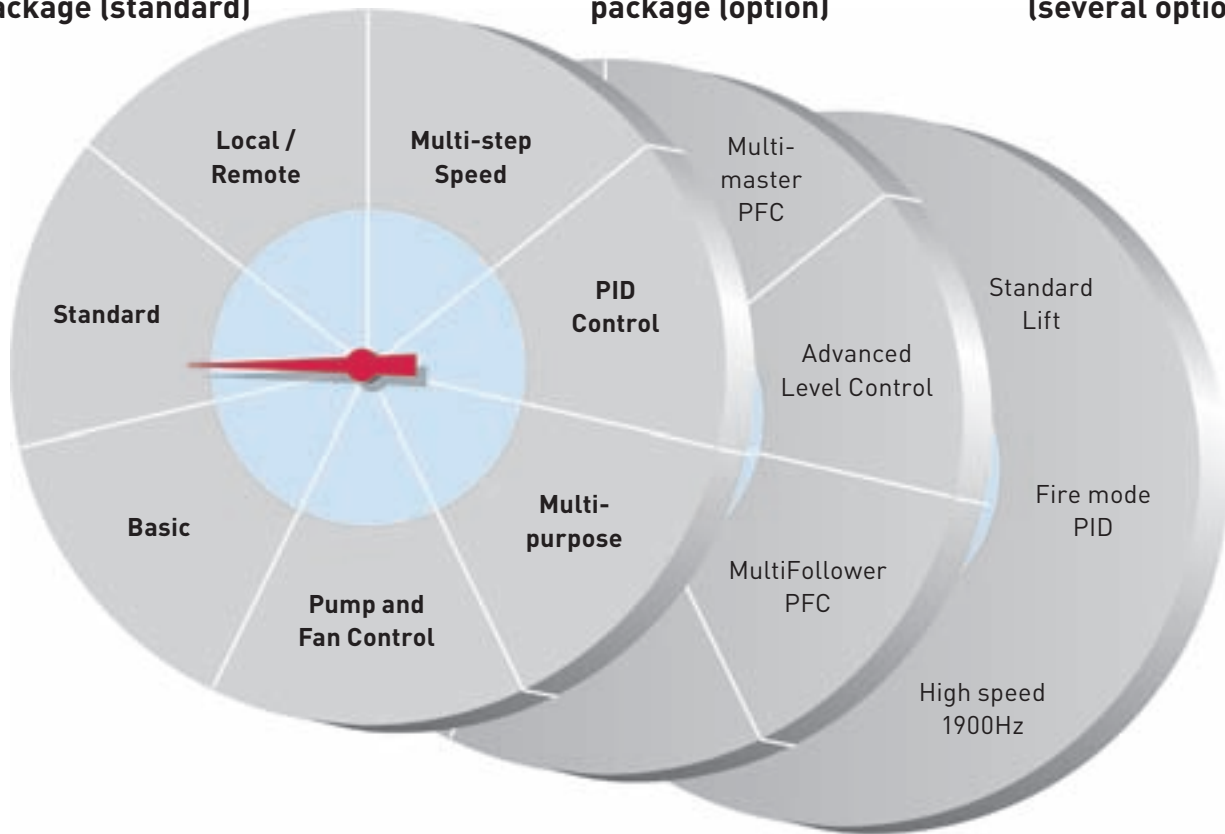
Two external control places

## SOFTWARE MODULARITY

### All-in-one Application package (standard)

### Water Solutions application package (option)

### Special Applications (several options)



The All-in-One application package has seven applications (=default settings and functionality of control inputs and outputs, see tables below) which can be selected with one parameter. The application will also be requested by the Start-up Wizard at the first power-up. With this single setting, the controls can be programmed e.g. for two external control places or a pressure control with the integrated PID controller. In most cases, the default basic application is suitable and only the min/max frequencies as well as motor nominal values must be set.

Thanks to the modular software applications made by the Vacon NC61131-3 Engineering tool, the All-in-One application package can be replaced by the Water application package that contains several applications optimized for water handling. There are also several other general-purpose software applications available.

P = Programmable

#### Multi-step Speed Control

I/O	Defaults	
A11	f <sub>ref</sub>	P
A12	f <sub>ref</sub>	P
DI1	Start forward	P
DI2	Start reverse	P
DI3	External fault	P
DI4	Speed select 1	
DI5	Speed select 2	
DI6	Speed select 3	
A01	f <sub>out</sub>	P
D01	Ready	P
R01	Run	P
R02	Fault	P

16 fixed speeds

#### PID Control

I/O	Defaults	
A11	PID reference	P
A12	PID actual value	P
DI1	PID start/stop	
DI2	External fault	P
DI3	Fault reset	P
DI4	f ctrl start/stop	
DI5	Jog speed select	P
DI6	PID/f ctrl select	
A01	f <sub>out</sub>	P
D01	Ready	P
R01	Run	P
R02	Fault	P

When PID is required

#### Multi-purpose Control

I/O	Defaults	
A11	f <sub>ref</sub>	P
A12	f <sub>ref</sub>	P
DI1	Start forward	P
DI2	Start reverse	P
DI3	Fault reset	P
DI4	Jog speed sel	P
DI5	External fault	P
DI6	Acc/dec time sel	P
A01	f <sub>out</sub>	P
D01	Ready	P
R01	Run	P
R02	Fault	P

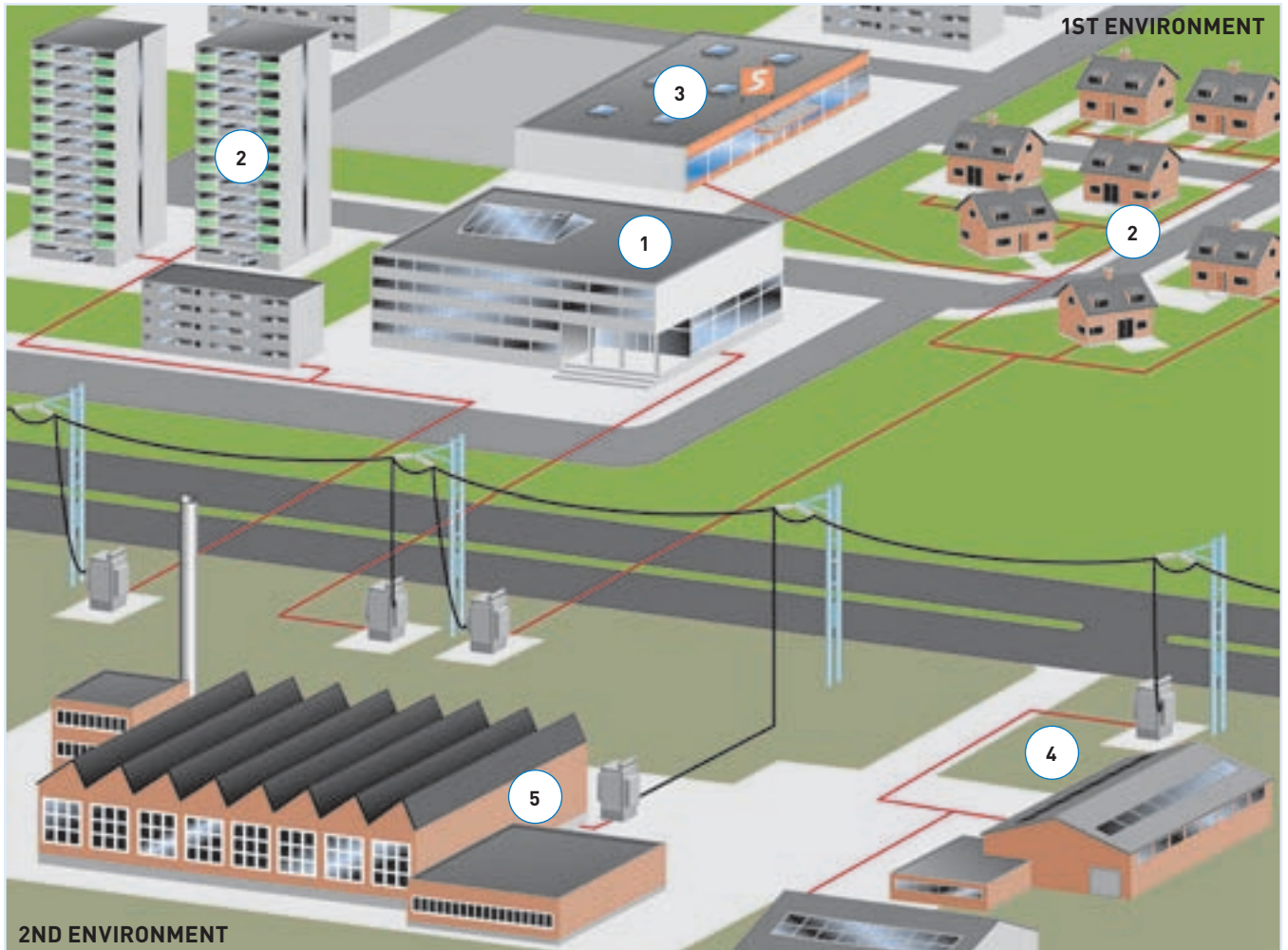
Most flexible of all

#### Pump and Fan Control

I/O	Defaults	
A11	PID reference	P
A12	PID actual value	P
DI1	PID start/stop	P
DI2	Interlock 1	P
DI3	Interlock 2	P
DI4	f ctrl start/stop	P
DI5	Jog speed select	P
DI6	PID/f ctrl select	P
A01	f <sub>out</sub>	P
D01	Fault	P
R01	Autochange 1	P
R02	Autochange 2	P

Control of up to five pumps with auto-change

**EMC AND INSTALLATION ENVIRONMENT**



The product family standard EN61800-3 sets limits for both emissions and immunity of radio frequency disturbances. The environment has been divided into the 1st and 2nd environments, i.e. in practice, the public and industrial networks, respectively.

Radio Frequency Interference (RFI) filters are typically required to meet the EN61800-3 standard. These filters are integrated in the Vacon NXS as standard.

The 208-240 V and 380-500 V ranges of the Vacon NXS (FR4-FR9) fulfills the requirements of the 1st and 2nd environments (H level: EN61800-3(2004), category C2). No additional RFI filters or cabinets are required. The FR10-FR11 and the 525-690 V range of the Vacon NXS fulfills the requirements of the 2nd environment (L-level: EN61800-3(2004), category C3).

The units in the frame sizes of FR4, FR5 and FR6 (the voltage range from 380 to 500 V) are also available with extremely low-emission integrated EMC filters (C level: EN61800-3 (2004), category C1). This is sometimes required in very sensitive locations such as hospitals.

**EMC Selection Table, restricted distribution**

	1	2	3	4	5	
Vacon NXS EMC	Hospital	Residential Area	Commercial	Light Industry Area	Heavy Industry	Marine
C	O					
H	R	R	R	O	O	
L				R	R	
T					R (IT Network)	R (IT Network)

R = Required ; O = Optional

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روبروی پالایشگاه نفت پارس، پلاک ۱۲

## TECHNICAL DATA

<b>Mains connection</b>	Input voltage $U_{in}$	208...240 V; 380...500 V; 525...690 V; (-15%...+10%)
	Input frequency	50...60 Hz ( $\pm 10\%$ )
	Connection to mains	Once per minute or less (normal case)
<b>Motor connection</b>	Output voltage	0— $U_{in}$
	Continuous output current	High overloadability: $I_H$ Low overloadability: $I_L$
	Overloadability	High: $1.5 \times I_H$ (1 min/10 min), Low: $1.1 \times I_L$ (1 min/10 min)
	Max. starting current	$I_s$ for 2 s every 20 s
	Output frequency	0...320 Hz; up to 7200 Hz with special software
	Frequency resolution	0.01 Hz
<b>Control characteristics</b>	Control method	Frequency control U/f; Open Loop Vector Control (speed, torque)
	Switching frequency	208..240V/380..500V: FR4-6: 1...16 kHz; Factory default: 10 kHz FR7-9: 1...10 kHz; Factory default: 3.6 kHz FR10-11: 1...6 kHz; Factory default: 3.6 kHz 525..690V: FR4-11: 1...6 kHz, Factory default: 1.5 kHz
	Field weakening point	8...320 Hz
	Acceleration time	0...3000 sec
	Deceleration time	0...3000 sec
	Braking	DC brake: $30\% * T_N$ (without brake resistor), flux braking
<b>Ambient conditions</b>	Ambient operating temperature	-10°C (no frost)...+50°C: $I_H$ (FR10-FR11: max +40°C) -10°C (no frost)...+40°C: $I_L$ (NXS 0416 6 and NXS 0590 6: max +35°C)
	Storage temperature	-40°C...+70°C
	Relative humidity	0 to 95% RH, non-condensing, non-corrosive, no dripping water
	Air quality: - chemical vapours - mechanical particles	IEC 60721-3-3, unit in operation, class 3C2 IEC 60721-3-3, unit in operation, class 3S2
	Altitude	100% load capacity (no derating) up to 1000 m 1-% derating for each 100 m above 1000 m; max. 3000 m
	Vibration EN50178/EN60068-2-6	5...150 Hz: Displacement amplitude 1 mm (peak) at 5...15.8 Hz (FR10-FR11: 0,25 mm (peak) at 5...31 Hz) Max acceleration amplitude 1 G at 15.8...150 Hz (FR10 and up: 1 G at 31...150 Hz)
	Shock EN50178, EN60068-2-27	UPS Drop Test (for applicable UPS weights) Storage and shipping: max 15 G, 11 ms (in package)
	Enclosure class	IP21 and IP54
<b>EMC</b>	Immunity	Fulfil all EMC immunity requirements
	Emissions	<b>EMC level C:</b> EN61800-3 (2004), category C1 <b>EMC level H:</b> EN61800-3 (2004), category C2 <b>EMC level L:</b> EN61800-3 (2004), category C3 <b>EMC level T:</b> Low earth-current solution suitable for IT networks, EN61800-3 (2004), category C4
<b>Safety</b>		EN 50178 (1997), EN 60204-1 (2006), IEC 61800-5, CE, UL, CUL; (see unit nameplate for more detailed approvals)
<b>Control connections (OPT-A1, -A2 or OPT-A1, -A3)</b>	Analogue input voltage	0...+10 V [-10 V...+10 V joystick control], $R_i = 200 \text{ k}\Omega$ , resolution 0.1%, accuracy $\pm 1\%$
	Analogue input current	0(4)...20 mA, $R_i = 250 \Omega$ differential, resolution 0.1%, accuracy $\pm 1\%$
	Digital inputs	6, positive or negative logic; 18...30 VDC
	Auxiliary voltage	+24 V, $\pm 15\%$ , max. 250 mA
	Output reference voltage	+10 V, +3%, max. load 10 mA
	Analogue output	0(4)...20 mA; $R_L$ max. 500 $\Omega$ , resolution 10 bit, accuracy $\pm 2\%$
	Digital output	Open collector output, 50 mA/48 V
	Relay outputs	2 programmable change-over (NO/NC) relay outputs (OPT-A3: NO/NC+NO) Switching capacity: 24 VDC/8 A, 250 VAC/8 A, 125 VDC/0.4 A. Min. switching load: 5 V/10 mA
Thermistor input (OPT-A3)	Galvanically isolated, $R_{trip} = 4.7 \text{ k}\Omega$	
<b>Protections</b>		Overvoltage, undervoltage, earth fault, mains supervision, motor phase supervision, overcurrent, unit overtemperature, motor overload, motor stall, motor underload, short-circuit of +24 V and +10 V reference voltages



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## VACON NXP AND NXC SUPERLATIVE PERFORMANCE

# VACON

DRIVEN BY DRIVES

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روبروی پالایشگاه نفت پارس، پلاک ۱۲



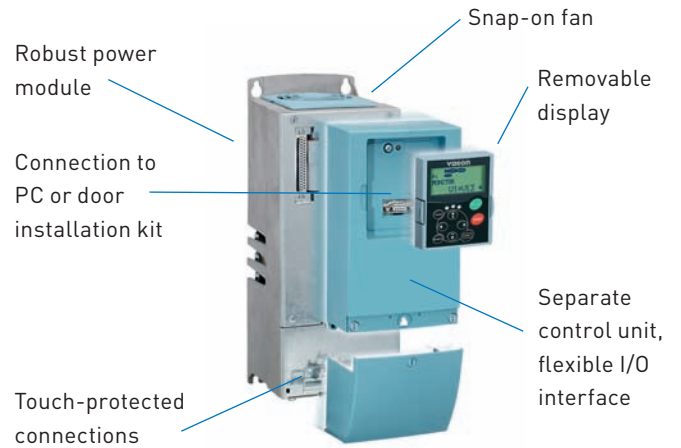
## THE DYNAMIC CHOICE

The Vacon NXP is a state-of-art AC drive for use in all applications where reliability, dynamic performance, precision and power are required.

The quality and reliability of a machine or process is, in most cases, the result of the precise, dynamic control of AC motors. The Vacon NXP has been designed to provide the best possible control under all circumstances, ensuring high operational quality and availability for the entire lifetime of a system.

A forerunner in designing and manufacturing AC drives, Vacon has developed innovative solutions and leading-edge technology for demanding applications and high power ranges.

By making these solutions available to customers, the Vacon NXP opens up new opportunities and helps them create exceptional and highly innovative products, and achieve the most challenging targets.



### Key features and benefits

#### Full power and voltage range

The use of the same control part, option boards, same software and diagnostic tools lowers the investment costs, and minimizes training and commissioning time.

#### High number of standardized options

Easy to order and well-documented options reduce the need for additional engineering.

#### Wide range of applications adapts the Vacon NXP to virtually any need

Ready applications, even for the most demanding use, reduce the need for application engineering.

#### Controls induction and permanent magnet motors

The same NXP drive is used for induction and PM motor control. No need to consider any special arrangements or additional engineering.

#### Dynamic open and closed loop vector control

Accurate control, even in the most demanding applications, improves productivity and quality.

#### Complete range of communications and I/O options

Ready and well-documented option boards to satisfy almost any requirements while reducing the amount of additional engineering.

#### Marine type approvals and functional safety features

Reduces the need for additional certification while lowering investment costs.

### VACON NXP FR4-FR9



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**OUTSTANDING FLEXIBILITY**

The Vacon NXP offers, in addition to its control characteristics, a wide choice of products for different needs within the whole power range.

Four models are available to meet various customer needs:

- Vacon NXP IP21/IP54 wall-mounted or standalone drives
- Vacon NXP high-power IP00 drive modules for cabinet installation
- Vacon NXC robust cabinet drive with maximum flexibility and a wide range of options
- Vacon NXC low-harmonic cabinet drive for applications where low-harmonics are required



**VACON NXP**  
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**AND VACON NXC**  
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**VACON NXC**  
**LOW-HARMONIC DRIVES**  
تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)  
روبروی پالایشگاه نفت پارس، پلاک ۱۲

## WALL-MOUNTED VACON NXP

For the lower power range, Vacon NXP drives are available in a compact IP21 or IP54 enclosure. The Vacon NXP is one of the most compact and complete packages on the market, which has all the necessary components integrated within a single enclosure.

The wall-mounted units are equipped with internal EMC filtering, and the power electronics are integrated into an all-metal frame. The smaller frame sizes (FR4-FR6) have an integrated brake chopper as standard, and the 380-500 V units can be equipped with an integrated brake resistor. The larger frames (FR7-FR12) can be equipped with an integrated brake chopper as an option.

### Mains voltage 208—240 V, 50/60 Hz, 3-

AC drive type	Loadability					Motor shaft power		Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+50°C)		Maximum current I <sub>s</sub>	230 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
NXP 0003 2A2H1SSS	3.7	4.1	2.4	3.6	4.8	0.55	0.37	FR4	128*292*190/5
NXP 0004 2A2H1SSS	4.8	5.3	3.7	5.6	7.4	0.75	0.55	FR4	128*292*190/5
NXP 0007 2A2H1SSS	6.6	7.3	4.8	7.2	9.6	1.1	0.75	FR4	128*292*190/5
NXP 0008 2A2H1SSS	7.8	8.6	6.6	9.9	13.2	1.5	1.1	FR4	128*292*190/5
NXP 0011 2A2H1SSS	11	12.1	7.8	11.7	15.6	2.2	1.5	FR4	128*292*190/5
NXP 0012 2A2H1SSS	12.5	13.8	11	16.5	22	3	2.2	FR4	128*292*190/5
NXP 0017 2A2H1SSS	17.5	19.3	12.5	18.8	25	4	3	FR5	144*391*214/ 8.1
NXP 0025 2A2H1SSS	25	27.5	17.5	26.3	35	5.5	4	FR5	144*391*214/ 8.1
NXP 0031 2A2H1SSS	31	34.1	25	37.5	50	7.5	5.5	FR5	144*391*214/ 8.1
NXP 0048 2A2H1SSS	48	52.8	31	46.5	62	11	7.5	FR6	195*519*237/ 18.5
NXP 0061 2A2H1SSS	61	67.1	48	72	96	15	11	FR6	195*519*237/ 18.5
NXP 0075 2A2H0SSS	75	83	61	92	122	22	15	FR7	237*591*257/ 35
NXP 0088 2A2H0SSS	88	97	75	113	150	22	22	FR7	237*591*257/ 35
NXP 0114 2A2H0SSS	114	125	88	132	176	30	22	FR7	237*591*257/ 35
NXP 0140 2A2H0SSS	140	154	105	158	210	37	30	FR8	291*758*344 / 58
NXP 0170 2A2H0SSS	170	187	140	210	280	45	37	FR8	291*758*344 / 58
NXP 0205 2A2H0SSS	205	226	170	255	336	55	45	FR8	291*758*344 / 58
NXP 0261 2A2H0SSF	261	287	205	308	349	75	55	FR9	480*1150*362/ 146
NXP 0300 2A2H0SSF	300	330	245	368	444	90	75	FR9	480*1150*362/ 146

### Mains voltage 380—500 V, 50/60 Hz, 3-

AC drive type	Loadability					Motor shaft power		Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+50°C)		Maximum current I <sub>s</sub>	400 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
NXP 0003 5A2H1SSS	3.3	3.6	2.2	3.3	4.4	1.1	0.75	FR4	128*292*190/5
NXP 0004 5A2H1SSS	4.3	4.7	3.3	5	6.2	1.5	1.1	FR4	128*292*190/5
NXP 0005 5A2H1SSS	5.6	6.2	4.3	6.5	8.6	2.2	1.5	FR4	128*292*190/5
NXP 0007 5A2H1SSS	7.6	8.4	5.6	8.4	10.8	3	2.2	FR4	128*292*190/5
NXP 0009 5A2H1SSS	9	9.9	7.6	11.4	14	4	3	FR4	128*292*190/5
NXP 0012 5A2H1SSS	12	13.2	9	13.5	18	5.5	4	FR4	128*292*190/5
NXP 0016 5A2H1SSS	16	17.6	12	18	24	7.5	5.5	FR5	144*391*214/ 8.1
NXP 0022 5A2H1SSS	23	25.3	16	24	32	11	7.5	FR5	144*391*214/ 8.1
NXP 0031 5A2H1SSS	31	34	23	35	46	15	11	FR5	144*391*214/ 8.1
NXP 0038 5A2H1SSS	38	42	31	47	62	18.5	15	FR6	195*519*237/ 18.5
NXP 0045 5A2H1SSS	46	51	38	57	76	22	18.5	FR6	195*519*237/ 18.5
NXP 0061 5A2H1SSS	61	67	46	69	92	30	22	FR6	195*519*237/ 18.5
NXP 0072 5A2H0SSS	72	79	61	92	122	37	30	FR7	237*591*257/ 35
NXP 0087 5A2H0SSS	87	96	72	108	144	45	37	FR7	237*591*257/ 35
NXP 0105 5A2H0SSS	105	116	87	131	174	55	45	FR7	237*591*257/ 35
NXP 0140 5A2H0SSS	140	154	105	158	210	75	55	FR8	291*758*344 / 58
NXP 0168 5A2H0SSS	170	187	140	210	280	90	75	FR8	291*758*344 / 58
NXP 0205 5A2H0SSS	205	226	170	255	336	110	90	FR8	291*758*344 / 58
NXP 0261 5A2H0SSF	261	287	205	308	349	132	110	FR9	480*1150*362/ 146
NXP 0300 5A2H0SSF	300	330	245	368	444	160	132	FR9	480*1150*362/ 146

## WALL-MOUNTED VACON NXP

Mains voltage 500—690 V, 50/60 Hz, 3~

AC drive type	Loadability					Motor shaft power		Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+50°C)		Maximum current I <sub>s</sub>	690 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
NXP 0004 6 A 2 L 0 SSS	4.5	5	3.2	4.8	6.4	3	2.2	FR6	195*519*237/ 18.5
NXP 0005 6 A 2 L 0 SSS	5.5	6.1	4.5	6.8	9.0	4	3	FR6	195*519*237/ 18.5
NXP 0007 6 A 2 L 0 SSS	7.5	8.3	5.5	8.3	11	5.5	4	FR6	195*519*237/ 18.5
NXP 0010 6 A 2 L 0 SSS	10	11	7.5	11.3	15	7.5	5.5	FR6	195*519*237/ 18.5
NXP 0013 6 A 2 L 0 SSS	13.5	14.9	10	15	20	11	7.5	FR6	195*519*237/ 18.5
NXP 0018 6 A 2 L 0 SSS	18	19.8	13.5	20.3	27	15	11	FR6	195*519*237/ 18.5
NXP 0022 6 A 2 L 0 SSS	22	24.2	18	27	36	18.5	15	FR6	195*519*237/ 18.5
NXP 0027 6 A 2 L 0 SSS	27	29.7	22	33	44	22	18.5	FR6	195*519*237/ 18.5
NXP 0034 6 A 2 L 0 SSS	34	37	27	41	54	30	22	FR6	195*519*237/ 18.5
NXP 0041 6 A 2 L 0 SSS	41	45	34	51	68	37.5	30	FR7	237*591*257/ 35
NXP 0052 6 A 2 L 0 SSS	52	57	41	62	82	45	37.5	FR7	237*591*257/ 35
NXP 0062 6 A 2 L 0 SSS	62	68	52	78	104	55	45	FR8	291*758*344 / 58
NXP 0080 6 A 2 L 0 SSS	80	88	62	93	124	75	55	FR8	291*758*344 / 58
NXP 0100 6 A 2 L 0 SSS	100	110	80	120	160	90	75	FR8	291*758*344 / 58
NXP 0125 6 A 2 L 0 SSF	125	138	100	150	200	110	90	FR9	480*1150*362/ 146
NXP 0144 6 A 2 L 0 SSF	144	158	125	188	213	132	110	FR9	480*1150*362/ 146
NXP 0170 6 A 2 L 0 SSF	170	187	144	216	245	160	132	FR9	480*1150*362/ 146
NXP 0208 6 A 2 L 0 SSF	208	229	170	255	289	200	160	FR9	480*1150*362/ 146



## STANDALONE VACON NXP

High-power Vacon NXP drives are also available in a compact standalone IP21 or IP54 enclosure. These units are designed for use in applications where the drive has to be compact and easy to install.

The Vacon NXP standalone drives are fully enclosed at the factory and are ready for immediate installation. The drive has integrated fuses as standard and no extra protections are required. It is also possible to equip the drive with an optional integrated load switch, which further simplifies handling in the field.

### Mains voltage 380—500 V, 50/60 Hz, 3-

AC drive type	Loadability					Motor shaft power		Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)		Maximum current I <sub>s</sub>	400 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
NXP 0385 5 A 2 L 0 SSA	385	424	300	450	540	200	160	FR10	595*2020*602/ 340
NXP 0460 5 A 2 L 0 SSA	460	506	385	578	693	250	200	FR10	595*2020*602/ 340
NXP 0520 5 A 2 L 0 SSA	520	572	460	690	828	250	250	FR10	595*2020*602/ 340
NXP 0590 5 A 2 L 0 SSA	590	649	520	780	936	315	250	FR11	794*2020*602/ 470
NXP 0650 5 A 2 L 0 SSA	650	715	590	885	1062	355	315	FR11	794*2020*602/ 470
NXP 0730 5 A 2 L 0 SSA	730	803	650	975	1170	400	355	FR11	794*2020*602/ 470

### Mains voltage 500—690 V, 50/60 Hz, 3-

AC drive type	Loadability					Motor shaft power		Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)		Maximum current I <sub>s</sub>	690 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
NXP 0261 6 A 2 L 0 SSA	261	287	208	312	375	250	200	FR10	595*2020*602/ 340
NXP 0325 6 A 2 L 0 SSA	325	358	261	392	470	315	250	FR10	595*2020*602/ 340
NXP 0385 6 A 2 L 0 SSA	385	424	325	488	585	355	315	FR10	595*2020*602/ 340
NXP 0416 6 A 2 L 0 SSA#	416	458	325	488	585	400	315	FR10	595*2020*602/ 340
NXP 0460 6 A 2 L 0 SSA	460	506	385	578	693	450	355	FR11	794*2020*602/ 400
NXP 0502 6 A 2 L 0 SSA	502	552	460	690	828	500	450	FR11	794*2020*602/ 400
NXP 0590 6 A 2 L 0 SSA#	590	649	502	753	904	560	500	FR11	794*2020*602/ 470

# max. ambient temperature of +35°C

## HARDWARE CONFIGURATIONS

FUNCTION	AVAILABILITY
IP21	Standard
IP54 (FR10 only)	Optional
Integrated fuses	Standard
Load switch (IEC or UL version)	Optional
EMC filtering L (EN 61800-3, category C3)	Standard
EMC filtering T (for IT-networks)	Optional
Brake chopper (cabling top entry)	Optional (H: +122 mm)



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The Vacon NXP high-power IP00 drive modules are designed for installation in a separate enclosure.

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

AC drive type	Loadability					Motor shaft power		Frame size	Module W*H*D (mm)/ kg	Chokes W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)		Maximum current I <sub>S</sub>	400 V supply				
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)			
NXP 0385 5A0N0SSA	385	424	300	450	540	200	160	FR10	500*1165*506/ 120	350*383*262/ 84 <sup>1)</sup>
NXP 0460 5A0N0SSA	460	506	385	578	693	250	200	FR10	500*1165*506/ 120	497*399*244/ 115 <sup>1)</sup>
NXP 0520 5A0N0SSA	520	572	460	690	828	250	250	FR10	500*1165*506/ 120	497*399*244/ 115 <sup>1)</sup>
NXP 0590 5A0N0SSA	590	649	520	780	936	315	250	FR11	709*1206*506/ 210	2x(350*383*262/ 84)
NXP 0650 5A0N0SSA	650	715	590	885	1062	355	315	FR11	709*1206*506/ 210	2x(350*383*262/ 84)
NXP 0730 5A0N0SSA	730	803	650	975	1170	400	355	FR11	709*1206*506/ 210	2x(350*383*262/ 84)
NXP 0820 5A0N0SSA	820	902	730	1095	1314	450	400	FR12	2x(500*1165*506/ 120)	2x(497*399*244/ 115)
NXP 0920 5A0N0SSA	920	1012	820	1230	1476	500	450	FR12	2x(500*1165*506/ 120)	2x(497*399*244/ 115)
NXP 1030 5A0N0SSA	1030	1133	920	1380	1656	560	500	FR12	2x(500*1165*506/ 120)	2x(497*399*244/ 115)
NXP 1150 5A0N0SSF	1150	1265	1030	1545	1854	630	560	FR13	2x(239*1030*372/67)+ 1x(708*1030*553/302)	2x(497*449*249/130)
NXP 1300 5A0N0SSF	1300	1430	1150	1725	2070	710	630	FR13	3x(239*1030*372/67)+ 1x(708*1030*553/302) <sup>2)</sup>	3x(497*449*249/130) <sup>3)</sup>
NXP 1450 5A0N0SSF	1450	1595	1300	1950	2340	800	710	FR13	3x(239*1030*372/67)+ 1x(708*1030*553/302) <sup>2)</sup>	3x(497*449*249/130) <sup>3)</sup>
NXP 1770 5A0N0SSF	1770	1947	1600	2400	2880	1000	900	FR14	4x(239*1030*372/67)+ 2x(708*1032*553/302)	4x(497*449*249/ 130)
NXP 2150 5A0N0SSF	2150	2365	1940	2910	3492	1200	1100	FR14	4x(239*1030*372/67)+ 2x(708*1032*553/302)	4x(497*449*249/ 130)

1) 12-pulse units, 2x(354\*319\*230/ 53 kg)

2) 12-pulse units, 4x(239x1030x372/67 + 1x(708x1030x553/302)

3) 12-pulse units, 4x(497\*449\*249/130)

**Mains voltage 500—690 V, 50/60 Hz, 3~**

AC drive type	Loadability					Motor shaft power		Frame size	Module W*H*D (mm)/ kg	Chokes W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)		Maximum current I <sub>S</sub>	690 V supply				
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)			
NXP 0261 6A0N0SSA	261	287	208	312	375	250	200	FR10	500*1165*506/ 120	354*319*230/ 53 <sup>1)</sup>
NXP 0325 6A0N0SSA	325	358	261	392	470	315	250	FR10	500*1165*506/ 120	350*383*262/ 84 <sup>1)</sup>
NXP 0385 6A0N0SSA	385	424	325	488	585	355	315	FR10	500*1165*506/ 120	350*383*262/ 84 <sup>1)</sup>
NXP 0416 6A0N0SSA#	416	458	325	488	585	400	315	FR10	500*1165*506/ 120	350*383*262/ 84 <sup>1)</sup>
NXP 0460 6A0N0SSA	460	506	385	578	693	450	355	FR11	709*1206*506/ 210	497*399*244/ 115 <sup>2)</sup>
NXP 0502 6A0N0SSA	502	552	460	690	828	500	450	FR11	709*1206*506/ 210	497*399*244/ 115 <sup>2)</sup>
NXP 0590 6A0N0SSA#	590	649	502	753	904	560	500	FR11	709*1206*506/ 210	2x(350*383*262/ 84)
NXP 0650 6A0N0SSA	650	715	590	885	1062	630	560	FR12	2x(500*1165*506/ 120)	2x(350*383*262/ 84)
NXP 0750 6A0N0SSA	750	825	650	975	1170	710	630	FR12	2x(500*1165*506/ 120)	2x(350*383*262/ 84)
NXP 0820 6A0N0SSA#	820	902	650	975	1170	800	630	FR12	2x(500*1165*506/ 120)	2x(350*383*262/ 84)
NXP 0920 6A0N0SSF	920	820	820	1230	1410	900	800	FR13	2x(239*1030*372/67)+ 1x(708*1030*553/302)	2x(497*449*249/130)
NXP 1030 6A0N0SSF	1030	920	920	1380	1755	1000	900	FR13	2x(239*1030*372/67)+ 1x(708*1030*553/302)	2x(497*449*249/130)
NXP 1180 6A0N0SSF#	1180	1030	1030	1463	1755	1150	1000	FR13	2x(239*1030*372/67)+ 1x(708*1030*553/302)	2x(497*449*249/130)
NXP 1500 6A0N0SSF	1500	1300	1300	1950	2340	1500	1300	FR14	3x(239*1030*372/67)+ 2x(708*1030*553/302) <sup>3)</sup>	3x(497*449*249/130) <sup>4)</sup>
NXP 1900 6A0N0SSF	1900	1500	1500	2250	2700	1800	1500	FR14	4x(239*1030*372/67)+ 2x(708*1030*553/302)	4x(497*449*249/130)
NXP 2250 6A0N0SSF#	2250	1900	1900	2782	3335	2000	1800	FR14	4x(239*1030*372/67)+ 2x(708*1030*553/302)	4x(497*449*249/130)

# max. ambient temperature of +35°C

1) 12-pulse units, 2x(354\*319\*230/ 53 kg)

2) 12-pulse units, 2x(350\*383\*262/ 84 kg)

3) 12-pulse units, 4x(239\*1030\*372/67 + 1x(708\*1030\*553/302)

4) 12-pulse units, 4x(497\*449\*249/130)

## VACON NXC, COMPACT AND FLEXIBLE

The Vacon NXC cabinet drive is compact and well-tested, fully utilizing the flexibility of the Vacon NXP drive. The Vacon NXC is designed to meet the most demanding requirements for flexibility, robustness, compactness and service-friendliness. It is a safe choice for any application.

### Key features and benefits

**One of the most compact on the market with same footprint in IP21/ IP54**

Maximum utilization of available space lowers overall investment costs.

**No additional cabinet fans**

Less service time and fewer spare parts lower overall maintenance costs.

**Increased flexibility with wide range of standardized options**

Reduces the need for additional design saving engineering time and costs.

**Easy accessible control compartment**

Makes commissioning easier, saving time and costs.

**Mounting rails and pull-out jig**

Reduce service time and lower service costs.

### Easy ordering

The Vacon NXC contains the AC drive itself and optional items such as the main switch, contactor, control options and output filtering in one compact unit that is easy to install and service. Ordering is made easy by integrating the Vacon NXC enclosure options into the typecode, to which they are appended with "+" codes.

### User-friendly

In the Vacon NXC, the control unit is mounted in a separate compartment at an easily accessible height together with all control options. Ample space around the power terminals allows easy installation and the connection of power cables. Bottom plates and earthing clamps for the 360-degree earthing of motor cable shields are provided as standard.

### Well-tested

Vacon NXC drives are the result of more than 20 years of experience in enclosure design, which has created a well-tested and proven solution. The good thermal handling of the enclosure guarantees a long lifetime for the AC drive and trouble-free operation even in the most demanding environments. Approved EMC solutions ensure the reliable operation of the converter without disturbing other electrical equipment.

### Service-friendly

The Vacon NXC enclosures are designed to fully utilize the new and innovative installation features of the high-power Vacon NXP. Vacon NXP power units are mounted on rails that are extendable with a pull-out jig. The jig can be used for pulling the power unit out of the enclosure for service.



Vacon NXC, FR11, IP21, with optional fuse switch.

## VACON NXP/NXC TYPE DESIGNATION CODE

**NXC 0520 5 A 2 L 0 SSF A1A2000000 + IFD**

- NXC options, see table below
- Option PCBs; each slot is represented by two characters where:  
Ax = basic I/O PCBs, Bx = expander I/O PCBs  
Cx = fieldbus PCBs, Dx = special PCBs
- Control  
S = standard FR4-FR8  
F = standard FR9 and NXC  
A = standard NXP FR10-FR12  
N = standard IP00 ≥ FR10 and NXC with IP54 control unit enclosure  
V = as S, but varnished PCBs  
G = as F, but varnished PCBs  
B = as A, but varnished PCBs  
O = as N, but varnished PCBs
- Cooling  
S = standard air-cooled, T = through-hole mounting FR4-FR9
- Supply  
S = 6-pulse, T = 12-pulse, O = 6-pulse + load switch (standalone)  
R = Low-harmonic
- Brake chopper: 0 = no brake chopper, 1 = integrated brake chopper
- EMC emission levels:  
C = category C1, EN 61800-3  
H = category C2, EN 61800-3  
L = category C3, EN 61800-3  
T = for IT networks  
N = enclosure required (FR10-FR14)
- Enclosure class: 0 = IP00 (module only), 2 = IP21 (Type 1), 5 = IP54 (Type 12)
- Control keypad  
A = standard alphanumeric, B = no local keypad  
F = dummy keypad, G = graphic display
- Nominal mains voltage  
5 = 380-500 VAC, 6 = 525-690 VAC, 2 = 208-240 VAC
- Nominal current voltage  
0520 = 520 A
- Product range  
NXP = wall-mounted / standalone / module, NXC = cabinet

## VACON NXC OPTIONS

Vacon NXC options give greater flexibility and make it easy to extend the range of functions. Options are available in different categories and can be combined to meet almost any requirements.

Control terminal options (T group)		Cabling options (C group)	
+T10	Basic I/O wired to external single-tier terminals	+CIT	Input (mains) cabling from top
+T1D	Basic I/O wired to external two-tier terminals+additional terminals	+COT	Output (motor) cabling from top
+TUP	Terminals for 230 VAC control voltage	<b>Auxiliary equipment (A group)</b>	
Input device options (I group)		+AMF	Motor fan control
+ILS	Load switch	+AMH	Motor heater feeder
+IFD	Switch fuse and fuses	+AMB	Mechanical brake control
+ICB	Circuit breaker	+AMO	Motor operator for +ICB
+ICO	Input contactor	+ACH	Cabinet heater
+IFU	Input fuses	+ACL	Cabinet light
Main circuit options (M group)		+ACR	Control relay
+MDC	Terminals in cabinet for DC / brake chopper	+AAI	Analogue signal isolator
Output filter options (O group)		+AAA	Auxiliary contact (control voltage devices)
+OCM	Common mode filters	+AAC	Auxiliary contact (input device)
+ODU	du/dt filter	+AT1	Auxiliary voltage transformer 200 VA
+OSI	Sine wave filter	+AT2	Auxiliary voltage transformer 750 VA
Protection devices (P group)		+AT3	Auxiliary voltage transformer 2500 VA
+PTR	External thermistor relay	+AT4	Auxiliary voltage transformer 4000 VA
+PES	Emergency stop (cat 0)	+ADC	Power supply 24 VDC 2.5 A
+PED	Emergency stop (cat 1)	+ACS	230 VAC customer socket
+PAP	Arc protection	Door-mounted options (D group)	
+PIF	Insulation fault sensor	+DLV	Pilot light (Control voltage on)
General options		+DLD	Pilot light (DO1)
+G40	400 mm empty cabinet	+DLF	Pilot light (FLT)
+G60	600 mm empty cabinet	+DLR	Pilot light (RUN)
+G80	800 mm empty cabinet	+DCO	Main contactor operation switch
+GPL	100 mm base	+DR0	Local / Remote operation switch
+GPH	200 mm base	+DEP	Emergency stop push-button
+FAT	Factory acceptance tests	+DRP	Reset push-button
+SWP	Seaworthy packing	+DAM	Analogue meter (AO1)
		+DAR	Potentiometer for reference



## VACON NXC, 6-PULSE SUPPLY

### Mains voltage 380—500 V, 50/60 Hz

AC drive type	Loadability					Motor shaft power		Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)		Maximum current I <sub>s</sub>	400 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
NXC 0261 5A2H0SSF	261	287	205	308	349	132	110	FR9	606*2275*605/ 371
NXC 0300 5A2H0SSF	300	330	245	368	444	160	132	FR9	606*2275*605/ 371
NXC 0385 5A2L0SSF	385	424	300	450	540	200	160	FR10	606*2275*605/ 371
NXC 0460 5A2L0SSF	460	506	385	578	693	250	200	FR10	606*2275*605/ 403
NXC 0520 5A2L0SSF	520	572	460	690	828	250	250	FR10	606*2275*605/ 403
NXC 0590 5A2L0SSF	590	649	520	780	936	315	250	FR11	806*2275*605/ 577
NXC 0650 5A2L0SSF	650	715	590	885	1062	355	315	FR11	806*2275*605/ 577
NXC 0730 5A2L0SSF	730	803	650	975	1170	400	355	FR11	806*2275*605/ 577
NXC 0820 5A2L0SSF	820	902	730	1095	1314	450	400	FR12	1206*2275*605/ 810
NXC 0920 5A2L0SSF	920	1012	820	1230	1476	500	450	FR12	1206*2275*605/ 810
NXC 1030 5A2L0SSF	1030	1133	920	1380	1656	560	500	FR12	1206*2275*605/ 810
NXC 1150 5A2L0SSF	1150	1265	1030	1545	1854	630	560	FR13	1406*2275*605/ 1000
NXC 1300 5A2L0SSF	1300	1430	1150	1725	2070	710	630	FR13	1606*2275*605/ 1150
NXC 1450 5A2L0SSF	1450	1595	1300	1950	2340	800	710	FR13	1606*2275*605/ 1150
NXC 1770 5A2L0SSF	1770	1947	1600	2400	2880	1000	900	FR14	2806*2275*605/ 2440
NXC 2150 5A2L0SSF	2150	2365	1940	2910	3492	1200	1100	FR14	2806*2275*605/ 2500

### Mains voltage 500—690 V, 50/60 Hz

AC drive type	Loadability					Motor shaft power		Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)		Maximum current I <sub>s</sub>	690 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
NXC 0125 6A2L0SSF	125	138	100	150	200	110	90	FR9	606*2275*605/ 371
NXC 0144 6A2L0SSF	144	158	125	188	213	132	110	FR9	606*2275*605/ 371
NXC 0170 6A2L0SSF	170	187	144	216	245	160	132	FR9	606*2275*605/ 371
NXC 0208 6A2L0SSF	208	229	170	255	289	200	160	FR9	606*2275*605/ 371
NXC 0261 6A2L0SSF	261	287	208	312	375	250	200	FR10	606*2275*605/ 341
NXC 0325 6A2L0SSF	325	358	261	392	470	315	250	FR10	606*2275*605/ 371
NXC 0385 6A2L0SSF	385	424	325	488	585	355	315	FR10	606*2275*605/ 371
NXC 0416 6A2L0SSF#	416	458	325	488	585	400	315	FR10	606*2275*605/ 371
NXC 0460 6A2L0SSF	460	506	385	578	693	450	355	FR11	806*2275*605/ 524
NXC 0502 6A2L0SSF	502	552	460	690	828	500	450	FR11	806*2275*605/ 524
NXC 0590 6A2L0SSF#	590	649	502	753	904	560	500	FR11	806*2275*605/ 577
NXC 0650 6A2L0SSF	650	715	590	885	1062	630	560	FR12	1206*2275*605/ 745
NXC 0750 6A2L0SSF	750	825	650	975	1170	710	630	FR12	1206*2275*605/ 745
NXC 0820 6A2L0SSF#	820	902	650	975	1170	800	630	FR12	1206*2275*605/ 745
NXC 0920 6A2L0SSF	920	1012	820	1230	1410	900	800	FR13	1406*2275*605/ 1000
NXC 1030 6A2L0SSF	1030	1133	920	1380	1755	1000	900	FR13	1406*2275*605/ 1000
NXC 1180 6A2L0SSF#	1180	1298	1030	1463	1755	1150	1000	FR13	1406*2275*605/ 1000
NXC 1500 6A2L0SSF	1500	1650	1300	1950	2340	1500	1300	FR14	2406*2275*605/ 2350
NXC 1900 6A2L0SSF	1900	2090	1500	2250	2700	1800	1500	FR14	2806*2275*605/ 2440
NXC 2250 6A2L0SSF#	2250	2475	1900	2782	3335	2000	1800	FR14	2806*2275*605/ 2500

# max. ambient temperature of +35°C

## HARDWARE CONFIGURATIONS

6-pulse	Enclosure		EMC			Brake chopper	Cabling		Input device					Output filters		
	380-500 V	IP21 IP54	L	T	H		Bottom	+CIT/+COT	+IFU	+ILS	+IFD	+ICO	+ICB	+OCM	+ODU	+OSI
FR9	S	O (H: +130)	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	0	O (W: +600)
FR10	S	O (H: +130)	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	0	O (W: +600)
FR11	S	O (H: +130)*	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	0	O (W: +600-800)
FR12	S	O (H: +130)	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	0	O (W: +1200)
FR13	S	O (H: +170)	S	O	-	1	S	O (W: +400)	-	-	S	-	0	0	0	O (W: +800)
FR14	S	O (H: +170)	S	O	-	1	S	O (W: +600)	-	-	-	-	S	0	S	O (W: +1600)
<b>500-690 V</b>																
FR9	S	O (H: +130)	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	0	O (W: +600)
FR10	S	O (H: +130)	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	0	O (W: +600)
FR11	S	O (H: +130)*	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	0	O (W: +600-800)
FR12	S	O (H: +130)	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	0	O (W: +1200)
FR13	S	O (H: +170)	S	O	-	1	S	O (W: +400)	-	-	S	-	0	0	0	O (W: +800)
FR14	S	O (H: +170)	S	O	-	1	S	O (W: +600)	-	-	-	-	S	0	S	O (W: +1600)

## VACON NXC, 12-PULSE SUPPLY

### Mains voltage 380—500 V, 50/60 Hz

AC drive type	Loadability					Motor shaft power			Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)		Maximum current I <sub>s</sub>	400 V supply				
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)			
NXC 0385 5 A 2 L 0 T S F	385	424	300	450	540	200	160	FR10	606*2275*605/ 371	
NXC 0460 5 A 2 L 0 T S F	460	506	385	578	693	250	200	FR10	606*2275*605/ 403	
NXC 0520 5 A 2 L 0 T S F	520	572	460	690	828	250	250	FR10	606*2275*605/ 403	
NXC 0590 5 A 2 L 0 T S F	590	649	520	780	936	315	250	FR11	806*2275*605/ 577	
NXC 0650 5 A 2 L 0 T S F	650	715	590	885	1062	355	315	FR11	806*2275*605/ 577	
NXC 0730 5 A 2 L 0 T S F	730	803	650	975	1170	400	355	FR11	806*2275*605/ 577	
NXC 0820 5 A 2 L 0 T S F	820	902	730	1095	1314	450	400	FR12	1206*2275*605/ 810	
NXC 0920 5 A 2 L 0 T S F	920	1012	820	1230	1476	500	450	FR12	1206*2275*605/ 810	
NXC 1030 5 A 2 L 0 T S F	1030	1133	920	1380	1656	560	500	FR12	1206*2275*605/ 810	
NXC 1150 5 A 2 L 0 T S F	1150	1265	1030	1545	1854	630	560	FR13	1406*2275*605/ 1000	
NXC 1300 5 A 2 L 0 T S F	1300	1430	1150	1725	2070	710	630	FR13	2006*2275*605/ 1150	
NXC 1450 5 A 2 L 0 T S F	1450	1595	1300	1950	2340	800	710	FR13	2006*2275*605/ 1150	
NXC 1770 5 A 2 L 0 T S F	1770	1947	1600	2400	2880	1000	900	FR14	2806*2275*605/ 2440	
NXC 2150 5 A 2 L 0 T S F	2150	2365	1940	2910	3492	1200	1100	FR14	2806*2275*605/ 2500	

### Mains voltage 500—690 V, 50/60 Hz

AC drive type	Loadability					Motor shaft power			Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)		Maximum current I <sub>s</sub>	690 V supply				
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)			
NXC 0261 6 A 2 L 0 T S F	261	287	208	312	375	250	200	FR10	606*2275*605/ 341	
NXC 0325 6 A 2 L 0 T S F	325	358	261	392	470	315	250	FR10	606*2275*605/ 371	
NXC 0385 6 A 2 L 0 T S F	385	424	325	488	585	355	315	FR10	606*2275*605/ 371	
NXC 0416 6 A 2 L 0 T S F #	416	458	325	488	585	400	315	FR10	606*2275*605/ 403	
NXC 0460 6 A 2 L 0 T S F	460	506	385	578	693	450	355	FR11	806*2275*605/ 524	
NXC 0502 6 A 2 L 0 T S F	502	552	460	690	828	500	450	FR11	806*2275*605/ 524	
NXC 0590 6 A 2 L 0 T S F #	590	649	502	753	904	560	500	FR11	806*2275*605/ 577	
NXC 0650 6 A 2 L 0 T S F	650	715	590	885	1062	630	560	FR12	1206*2275*605/ 745	
NXC 0750 6 A 2 L 0 T S F	750	825	650	975	1170	710	630	FR12	1206*2275*605/ 745	
NXC 0820 6 A 2 L 0 T S F #	820	902	650	975	1170	800	630	FR12	1206*2275*605/ 745	
NXC 0920 6 A 2 L 0 T S F	920	1012	820	1230	1410	900	800	FR13	1406*2275*605/ 1000	
NXC 1030 6 A 2 L 0 T S F	1030	1133	920	1380	1755	1000	900	FR13	1406*2275*605/ 1000	
NXC 1180 6 A 2 L 0 T S F #	1180	1298	1030	1463	1755	1150	1000	FR13	1406*2275*605/ 1000	
NXC 1500 6 A 2 L 0 T S F	1500	1650	1300	1950	2340	1500	1300	FR14	2806*2275*605/ 2440	
NXC 1900 6 A 2 L 0 T S F	1900	2090	1500	2250	2700	1800	1500	FR14	2806*2275*605/ 2440	
NXC 2250 6 A 2 L 0 T S F #	2250	2475	1900	2782	3335	2000	1800	FR14	2806*2275*605/ 2500	

# max. ambient temperature of +35°C

## HARDWARE CONFIGURATIONS

12-pulse	Enclosure		EMC			Brake chopper	Cabling		Input device					Output filters			
	IP21	IP54	L	T	H		Top	Bottom	+CIF/+COT	+IFU	+ILS	+IFD	+ICO	+ICB	+OCM	+ODU	+OSI
<b>380-500 V</b>																	
FR10	S	O (H: +130)	S	O	-	-	S	O (W: +400)	0	-	-	-	0	0	O (W: +400)	O (W: +600)	
FR11	S	O (H: +130)*	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	O (W: +400)	O (W: +600)	
FR12	S	O (H: +130)	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	O (W: +400)	O (W: +1200)	
FR13	S	O (H: +170)	S	O	-	1	S	O (W: +400)	-	-	-	-	S	0	0	O (W: +800)	
FR14	S	O (H: +170)	S	O	-	1	S	O (W: +800)	-	-	-	-	S	0	S	O (W: +1600)	
<b>500-690 V</b>																	
FR10	S	O (H: +130)	S	O	-	-	S	O (W: +400)	0	-	-	-	0	0	O (W: +400)	O (W: +600)	
FR11	S	O (H: +130)*	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	O (W: +400)	O (W: +600-800)	
FR12	S	O (H: +130)	S	O	-	0	S	O (W: +400)	0	0	0	0	0	0	O (W: +400)	O (W: +1200)	
FR13	S	O (H: +170)	S	O	-	1	S	O (W: +400)	-	-	-	-	S	0	0	O (W: +800)	
FR14	S	O (H: +170)	S	O	-	1	S	O (W: +800)	-	-	-	-	S	0	S	O (W: +1600)	

S = Standard

O = Optional

<sup>1)</sup> (W: +400) = Contact factory

\*) NXC07305 and NXC05906, H: +170 mm

## VACON NXC LOW-HARMONIC DRIVE

The Vacon NXC low-harmonic drive creates savings in applications where low-harmonics are required.

### Key features and benefits

**Clean power with total current harmonics THDi < 5 %**

Over-dimensioning of power transformer or input cables is not required. Reduces overall investment costs and optimizes the use of available space.

**No external active or passive filters are needed**

Reduces system complexity and overall investment costs.

**No need for special 12-pulse transformers**

Well suited for retrofit projects.

**No additional cabinet fans**

Less service time and fewer spare parts lower overall maintenance costs.

**Increased flexibility with wide range of standardized options**

Reduces the need for additional design saving engineering time and costs.

Vacon NXC low-harmonic cabinet drives are the perfect choice for applications where low harmonics are required.

### Clean power saves on costs

The low-harmonic cabinet drive offers an excellent total solution to meet even the most demanding power quality requirements. The drive complies with the IEEE-519, G5/4 harmonic standards, when correctly installed.

The low current THDi reduces supply currents and allows supply transformers, protection devices and power cables to be smaller. It creates savings for new and retrofit projects because there is no need to invest in expensive 12- or 18-pulse transformers when new or old existing 6-pulse transformers can be used.

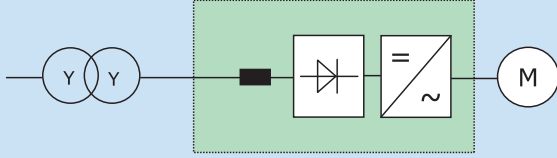
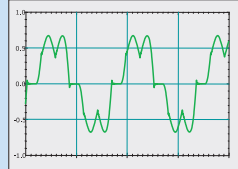
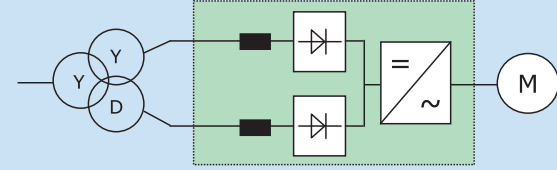
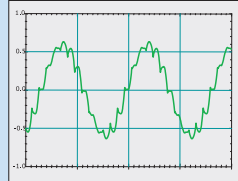
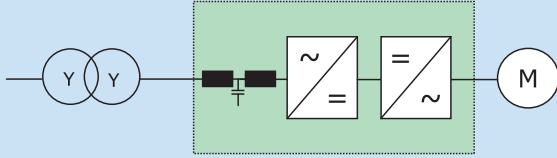
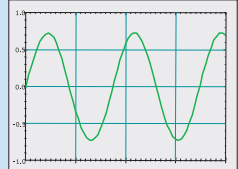


Vacon NXC low-harmonic drive, F110+F110, IP21.

## VACON NXC OPTIONS

<p><b>Auxiliary equipment (A group)</b></p> <ul style="list-style-type: none"> <li>+AMF Motor fan control</li> <li>+AMH Motor heater feeder</li> <li>+AMB Mechanical brake control</li> <li>+ACH Cabinet heater</li> <li>+ACL Cabinet light</li> <li>+ACR Control relay</li> <li>+AAI Analogue signal isolator</li> <li>+AAA Aux. contact (ctrl voltage)</li> <li>+AAC Aux. contact (input device)</li> <li>+AT3 Aux. voltage transformer 2500 VA</li> <li>+AT4 Aux. voltage transformer 4000 VA</li> <li>+ADS 230 VAC customer socket</li> </ul>	<p><b>Door-mounted options (D group)</b></p> <ul style="list-style-type: none"> <li>+DLV Pilot light (control voltage on)</li> <li>+DLD Pilot light (D01)</li> <li>+DLF Pilot light (FLT)</li> <li>+DLR Pilot light (RUN)</li> <li>+DEP Emergency stop push-button</li> <li>+DRP Reset push-button</li> <li>+DAM Analogue meter (A01)</li> <li>+DAR Potentiometer for reference</li> <li>+DCM Analogue meter current trafo</li> <li>+DVM Analogue voltage meter switch</li> </ul>	<p><b>Output filter options (O group)</b></p> <ul style="list-style-type: none"> <li>+OCM Common mode filters</li> <li>+ODU du/dt filter</li> <li>+OSI Sine wave filter</li> </ul>
<p><b>Control terminal options (T group)</b></p> <ul style="list-style-type: none"> <li>+TIO Basic I/O wired to external single-tier terminals</li> <li>+TID Basic I/O wired to external two-tier terminals + additional terminals</li> </ul>	<p><b>General options</b></p> <ul style="list-style-type: none"> <li>+G40 400 mm empty cabinet</li> <li>+G60 600 mm empty cabinet</li> <li>+G80 800 mm empty cabinet</li> <li>+GPL 100 mm base</li> <li>+GPL 200 mm base</li> <li>+FAT Factory acceptance tests</li> <li>+SWP Seaworthy packing</li> </ul>	<p><b>Protection devices (P group)</b></p> <ul style="list-style-type: none"> <li>+PTR External thermistor relay</li> <li>+PES Emergency stop (cat 0)</li> <li>+PED Emergency stop (cat 1)</li> <li>+PAP Arc protection</li> <li>+PIF Insulation fault sensor</li> </ul>
		<p><b>Cabling options (C group)</b></p> <ul style="list-style-type: none"> <li>+CIT Input (mains) cabling from top</li> <li>+COT Output (motor) cabling from top</li> </ul>

## CURRENT HARMONIC MITIGATION

<p><b>6-pulse drive with choke</b></p> <p>Cost-effective transformer and simple power cabling with high current distortion. Oversizing of transformers needed due to high THDi.</p>		<p><b>Current distortion (THDi) &gt; 35 %</b></p> 
<p><b>12-pulse drive with choke</b></p> <p>Higher transformer and power cabling cost. Low current distortion on primary side of transformer.</p>		<p><b>Current distortion (THDi) &gt; 12 %</b></p> 
<p><b>Low-harmonic drive</b></p> <p>Cost effective transformer and power cabling with very low current distortion. No oversizing of transformer needed.</p>		<p><b>Current distortion (THDi) &lt; 5 %</b></p> 

## VACON NXC LOW-HARMONIC DRIVE

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

Low-harmonic drive type	Loadability					Motor shaft power		Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)		Maximum current I <sub>s</sub> (A)	400 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
NXC 0261 5 A 2 L 0 RSF	261	287	205	308	349	132	110	F19 + F19	1006*2275*605/680
NXC 0300 5 A 2 L 0 RSF	300	330	245	368	444	160	132	F19 + F19	1006*2275*605/680
NXC 0385 5 A 2 L 0 RSF	385	424	300	450	540	200	160	F110 + F110	1006*2275*605/700
NXC 0460 5 A 2 L 0 RSF	460	506	385	578	693	250	200	F110 + F110	1006*2275*605/700
NXC 0520 5 A 2 L 0 RSF	520	572	460	690	828	250	250	F110 + F110	1006*2275*605/700
NXC 0650 5 A 2 L 0 RSF	650	715	590	885	1062	355	315	2x F110 + F112	2006*2275*605/1400
NXC 0730 5 A 2 L 0 RSF	730	803	650	975	1170	400	355	2x F110 + F112	2006*2275*605/1400
NXC 0820 5 A 2 L 0 RSF	820	902	730	1095	1314	450	400	2x F110 + F112	2006*2275*605/1400
NXC 0920 5 A 2 L 0 RSF	920	1012	820	1230	1476	500	450	2x F110 + F112	2006*2275*605/1400
NXC 1030 5 A 2 L 0 RSF	1030	1133	920	1380	1656	560	500	2x F110 + F112	2006*2275*605/1400
NXC 1150 5 A 2 L 0 RSF	1150	1265	1030	1545	1854	630	560	F113 + F113	2206*2275*605/1950
NXC 1300 5 A 2 L 0 RSF	1300	1430	1150	1725	2070	710	630	F113 + F113	2206*2275*605/1950
NXC 1450 5 A 2 L 0 RSF	1450	1595	1300	1950	2340	800	710	F113 + F113	2206*2275*605/1950
NXC 1770 5 A 2 L 0 RSF	1770	1947	1600	2400	2880	1000	900	2x F113 + F114	4406*2275*605/3900
NXC 2150 5 A 2 L 0 RSF	2150	2365	1950	2910	3492	1200	1100	2x F113 + F114	4406*2275*605/3900
NXC 2700 5 A 2 L 0 RSF	2700	2970	2300	3278	3933	1500	1200	2x F113 + F114	4406*2275*605/3900

### Mains voltage 525–690 V, 50/60 Hz, 3~

Low-harmonic drive type	Loadability					Motor shaft power		Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)		Maximum current I <sub>s</sub> (A)	690 V supply			
	Rated continuous current I <sub>L</sub> (A)	10% overload current (A)	Rated continuous current I <sub>H</sub> (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
NXC 0125 6 A 2 L 0 RSF	125	138	100	150	200	110	90	F19 + F19	1006*2275*605/680
NXC 0144 6 A 2 L 0 RSF	144	158	125	188	213	132	110	F19 + F19	1006*2275*605/680
NXC 0170 6 A 2 L 0 RSF	170	187	144	216	245	160	132	F19 + F19	1006*2275*605/680
NXC 0208 6 A 2 L 0 RSF#	208	229	170	255	289	200	160	F19 + F19	1006*2275*605/680
NXC 0261 6 A 2 L 0 RSF	261	287	208	312	375	250	200	F110 + F110	1006*2275*605/700
NXC 0325 6 A 2 L 0 RSF	325	358	261	392	470	315	250	F110 + F110	1006*2275*605/700
NXC 0385 6 A 2 L 0 RSF	385	424	325	488	585	355	315	F110 + F110	1006*2275*605/700
NXC 0416 6 A 2 L 0 RSF#	416	416	325	488	585	400	315	F110 + F110	1006*2275*605/700
NXC 0460 6 A 2 L 0 RSF	460	506	385	578	693	450	355	2x F110 + F112	2006*2275*605/1400
NXC 0502 6 A 2 L 0 RSF	502	552	460	690	828	500	450	2x F110 + F112	2006*2275*605/1400
NXC 0590 6 A 2 L 0 RSF	590	649	502	753	904	560	500	2x F110 + F112	2006*2275*605/1400
NXC 0650 6 A 2 L 0 RSF	650	715	590	885	1062	630	560	2x F110 + F112	2006*2275*605/1400
NXC 0750 6 A 2 L 0 RSF	750	825	650	975	1170	710	630	2x F110 + F112	2006*2275*605/1400
NXC 0820 6 A 2 L 0 RSF#	820	902	650	975	1170	800	630	2x F110 + F112	2006*2275*605/1400
NXC 0920 6 A 2 L 0 RSF	920	1012	820	1230	1476	900	800	F113 + F113	2206*2275*605/1950
NXC 1030 6 A 2 L 0 RSF	1030	1133	920	1380	1656	1000	900	F113 + F113	2206*2275*605/1950
NXC 1180 6 A 2 L 0 RSF#	1180	1298	1030	1463	1755	1150	1000	F113 + F113	2206*2275*605/1950
NXC 1500 6 A 2 L 0 RSF	1500	1650	1300	1950	2340	1500	1300	2x F113 + F114	4406*2275*605/3900
NXC 1900 6 A 2 L 0 RSF	1900	2090	1500	2250	2700	1800	1500	2x F113 + F114	4406*2275*605/3900
NXC 2250 6 A 2 L 0 RSF#	2250	2475	1900	2782	3335	2000	1800	2x F113 + F114	4406*2275*605/3900

# max. ambient temperature of 35°C

## HARDWARE CONFIGURATIONS

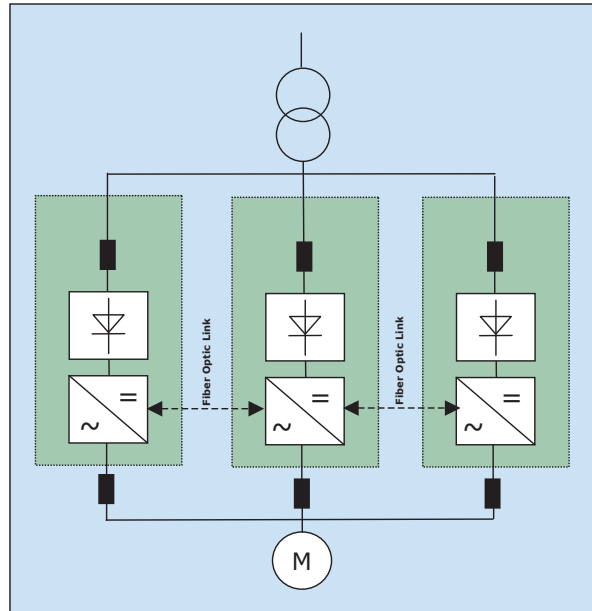
Active front-end	Enclosure		EMC		Brake chopper	Cabling		Input device	Output filters		
	380-500 V	IP21	IP54	L		T	Bottom		Top +CIT/+COT	+ILS & +ICB	+OCM
F19+F19	S	O (H: +130)	S	O	1) (W: +400)	S	O (W: +400)	S	O	O (W: +400)	O (W: +600)
F110+F110	S	O (H: +130)	S	O	1) (W: +400)	S	O (W: +400)	S	O	O (W: +400)	O (W: +600)
2 x F110+F112	S	O (H: +130)	S	O	1) (W: +400)	S	O (W: +400)	S	O	O (W: +400)	O (W: +1200)
F113+F113	S	O (H: +170)	S	O	1) (W: +400)	S	O (W: +400)	S	O	O	O (W: +800)
2 x F113+F114	S	O (H: +170)	S	O	1) (W: +400)	S	O (W: +600)	S	O	S	O (W: +1600)
<b>525-690 V</b>											
F19+F19	S	O (H: +130)	S	O	1) (W: +400)	S	O (W: +400)	S	O	O (W: +400)	O (W: +600)
F110+F110	S	O (H: +130)	S	O	1) (W: +400)	S	O (W: +400)	S	O	O (W: +400)	O (W: +600)
2 x F110+F112	S	O (H: +130)	S	O	1) (W: +400)	S	O (W: +400)	S	O	O (W: +400)	O (W: +1200)
F113+F113	S	O (H: +170)	S	O	1) (W: +400)	S	O (W: +400)	S	O	O	O (W: +800)
											O (W: +1600)

**VACON DRIVESYNCH**

The Vacon DriveSynch is a new, innovative control concept for running standard drives in parallel in order to control high-power AC motors or increase the redundancy of a system. This concept suits high-power single or multiple winding motors typically above 1 MW.

**High-power AC drives up to 5 MW can be built using standard drive components and have the following benefits:**

- The system is modular and easy to extend.
- High total power can be obtained by combining smaller drives.
- The redundancy of the system is higher than in a conventional drive because each unit can be run independently.
- The small size of the individual drive makes it easy to maintain and service.
- Identical individual units reduce the required amount of spare parts, reducing overall costs.
- No special skills are required for the engineering, installation, commissioning and maintenance of high-power drives as they are made from standard low-power modules.
- The du/dt filter at the output of each individual unit ensures load balancing.
- It is possible to run multiple winding motors with a phase shift between the windings.



Example of the DriveSynch configuration.

**Mains voltage 380—500 V, 50/60 Hz**

AC drive type	Loadability				Maximum current $I_s$ (A)	Motor shaft power		Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)			400 V supply			
	Rated continuous current $I_L$ (A)	10% overload current (A)	Rated continuous current $I_H$ (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
2 x NXC 1150 5 A 2 L 0 SSF	2150	2365	1940	2910	3492	1200	1100	2 x FR13	2x(1406*2275*605/1250)
2 x NXC 1300 5 A 2 L 0 SSF	2470	2717	2185	3278	3933	1350	1100	2 x FR13	2x(1606*2275*605/1350)
2 x NXC 1450 5 A 2 L 0 SSF	2755	3031	2470	3705	4446	1500	1350	2 x FR13	2x(1606*2275*605/1350)
3 x NXC 1150 5 A 2 L 0 SSF	3278	3605	2936	4403	5284	1800	1500	3 x FR13	3x(1406*2275*605/1250)
3 x NXC 1300 5 A 2 L 0 SSF	3705	4076	3278	4916	5900	2000	1800	3 x FR13	3x(1606*2275*605/1350)
3 x NXC 1450 5 A 2 L 0 SSF	4133	4546	3705	5558	6669	2250	2000	3 x FR13	3x(1606*2275*605/1350)

**Mains voltage 500—690 V, 50/60 Hz**

AC drive type	Loadability				Maximum current $I_s$ (A)	Motor shaft power		Frame size	Dimensions and weight W*H*D (mm)/ kg
	Low (+40°C)		High (+40°C)			690 V supply			
	Rated continuous current $I_L$ (A)	10% overload current (A)	Rated continuous current $I_H$ (A)	50% overload current (A)		10% overload P (kW)	50% overload P (kW)		
2 x NXC 0920 6 A 2 L 0 SSF	1748	1920	1500	2337	2679	1710	1520	2 x FR13	2x(1406*2275*605/1250)
2 x NXC 1030 6 A 2 L 0 SSF	1810	2000	1500	2337	2679	1710	1520	2 x FR13	2x(1406*2275*605/1250)
2 x NXC 1180 6 A 2 L 0 SSF*	1950	2140	1630	2500	3335	1900	1610	2 x FR13	2x(1406*2275*605/1250)
3 x NXC 0920 6 A 2 L 0 SSF	2622	2884	2337	3490	4019	2500	2200	3 x FR13	3x(1406*2275*605/1250)
3 x NXC 1030 6 A 2 L 0 SSF	2706	3000	2337	3490	4019	2500	2200	3 x FR13	3x(1406*2275*605/1250)
3 x NXC 1180 6 A 2 L 0 SSF*	2910	3210	2500	3735	5002	2800	2410	3 x FR13	3x(1406*2275*605/1250)

# max. ambient temperature of 35°C  
Values are given at switching frequency 2.0 kHz

## VACON NXP CONTROL

The Vacon NXP offers a high-performance control platform for all demanding drive applications. There are five slots (A, B, C, D and E) for I/O boards, and a suitable board can be selected for each slot (see table below).

An external +24 V supply option enables communication with the control unit even if the main supply is switched off (e.g. for fieldbus communication and parameter setting).

The Vacon NXP supports both **induction motors** and **permanent magnet motors** in open and closed loop control modes.

For a closed loop control encoder, feedback from an incremental pulse encoder is normally used. It is also possible to use absolute encoders, since the Vacon NXP is available with EnDat, SSI and resolver interfaces.

Fast drive-to-drive communication is possible using Vacon's fast SystemBus fiber optic communication.

The same control board is used in all NXP-based drives, allowing the maximum utilization of NXP control features over a wide power range.



## OPTION BOARDS

Type	Card slot					I/O signal																	Note							
	A	B	C	D	E	DI	DO	DI	AI	AI	AO	AO	RO	RO	+10V <sub>ref</sub>	Therm	+24V	pt100	42-240	DI/DO	DI/DO	DI		Resolver	Out +5V/	Out +15V/	Out +12V/	Out +5V/		
						DO	(mA/V)	(mA)	(mA/V)	(mA)	(NO/ NCI)	(NO)			EXT		VAC	(10...24V)	(RS422)	1Vp-p		+24V	+24V	+15V						
<b>Basic I/O cards (OPT-A)</b>																														
OPT-A1						6	1	2		1					1		2													
OPT-A2												2																		
OPT-A3												1	1		1															
OPT-A4						2															3/0			1						
OPT-A5						2															6/2				1					
OPT-A7																													2 enc. input + 1 enc. output	
OPT-A8						6	1	2		1					1		2												1)	
OPT-A9						6	1	2		1					1		2												2.5 mm <sup>2</sup> terminals	
OPT-AE							2														3/0								DO = Divider+Direction	
OPT-AF						2							1	1		1													EN954-1, cat 3 / ATEX therm.	
OPT-AK																							3						Sin/Cos/ Marker	
OPT-AN						6		2		2																			Limited support	
<b>I/O expander cards (OPT-B)</b>																														
OPT-B1						6											1												Selectable DI/DO	
OPT-B2												1	1		1															
OPT-B4									1		2						1													2)
OPT-B5																														
OPT-B8																	1	3												
OPT-B9						2													5											
OPT-BB						2																								Sin/Cos+ EnDat
OPT-BC						2																								Encoder out = Resolver simulation
OPT-BE																														EnDat/SSI
<b>Fieldbus cards (OPT-C)</b>																														
OPT-C2																														Modbus, N2
OPT-C3																														
OPT-C4																														
OPT-C5																														
OPT-C6																														
OPT-C7																														
OPT-C8																														
OPT-CG																														
OPT-CI																														
OPT-CJ																														
OPT-CP																														
OPT-CQ																														
<b>Communication cards (OPT-D)</b>																														
OPT-D1																														
OPT-D2																														
OPT-D3																														

### OPT-A1

Terminal	Default settings	Programmable
1	+10V	Reference voltage
2	AI1+	Frequency reference 0-10 V
3	AI1-	AI common (GND)
4	AI2+	Frequency reference 4-20 mA
5	AI2-	AI common (differential)
6	+24V	Control supply (bidirectional)
7	GND	I/O Ground
8	DIN1	Start forward
9	DIN2	Start reverse
10	DIN3	External fault input
11	CMA	Common for DIN1 - DIN3 (GND)
12	+24V	Control supply (bidirectional)
13	GND	I/O Ground
14	DIN4	Multi-step speed select 1
15	DIN5	Multi-step speed select 2
16	DIN6	Fault reset
17	CMB	Common for DIN4 - DIN6 (GND)
18	AO1+	Output frequency (0-20 mA)
19	AO1-	AO common (GND)
20	DO1	READY, $I \leq 50 \text{ mA}$ , $U \leq 48 \text{ VDC}$

### OPT-A2

Terminal	Default settings	Programmable
21	R01	RUN
22	R01	
23	R01	
24	R02	FAULT
25	R02	
26	R02	

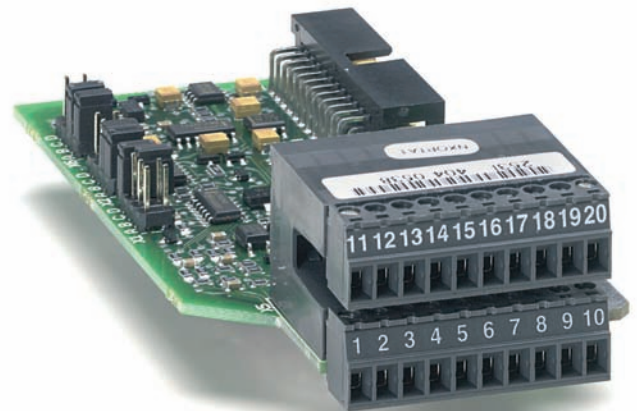
### OPT-A3 (alternative)

Terminal	Default settings	Programmable	
21	R01	RUN	
22	R01		
23	R01		
24	R02	FAULT	
25	R02		
26	R02		
28	T11+	Thermistor	Warning
29	T11-	input FAULT	No response

Default settings of OPT-A1, OPT-A2 and OPT-A3 for the Basic and Standard Applications.

### OPT-A4 (encoder input example)

Terminal	Technical information
1	DIC1A+
2	DIC1A-
3	DIC2B+
4	DIC2B-
5	DIC3Z+
6	DIC3Z-
7	ENC1Q
8	DIC4
9	GND
10	+5V/+15V/+24V



Option board OPT-A1.



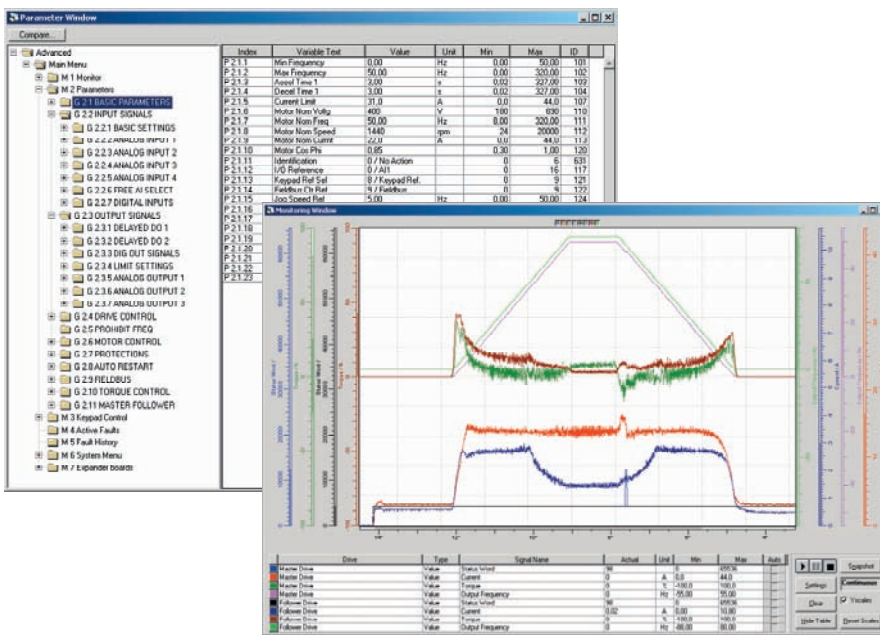
## FIRST-CLASS USABILITY



The text display with functions such as multi-monitoring, parameter copy, parameter backup and start-up wizard makes commissioning easy.

Vacon PC tools can be downloaded from the Vacon website at <http://www.vacon.com>. They include:

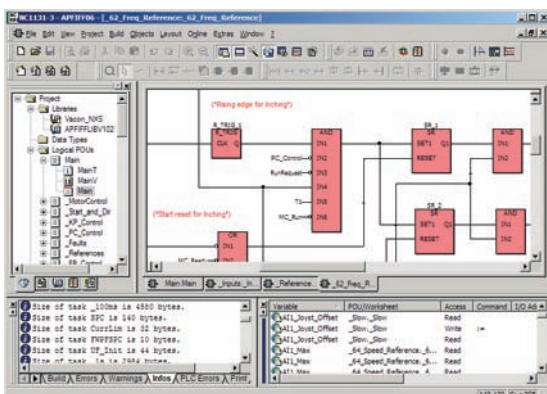
- **Vacon NCDrive** for setting, copying, storing, printing, monitoring and controlling parameters
- **Vacon NCLoad** for updating software and uploading special software to the drive
- **Vacon NC61131-3 Engineering** is available for making tailor-made software. A license key and training are required.



The Vacon NCDrive communicates with the drive via the following interfaces:

- RS-232
- Ethernet TCP/IP
- CAN (fast multiple drive monitoring)
- CAN@Net (remote monitoring)

## PLC FUNCTIONALITY BUILT IN



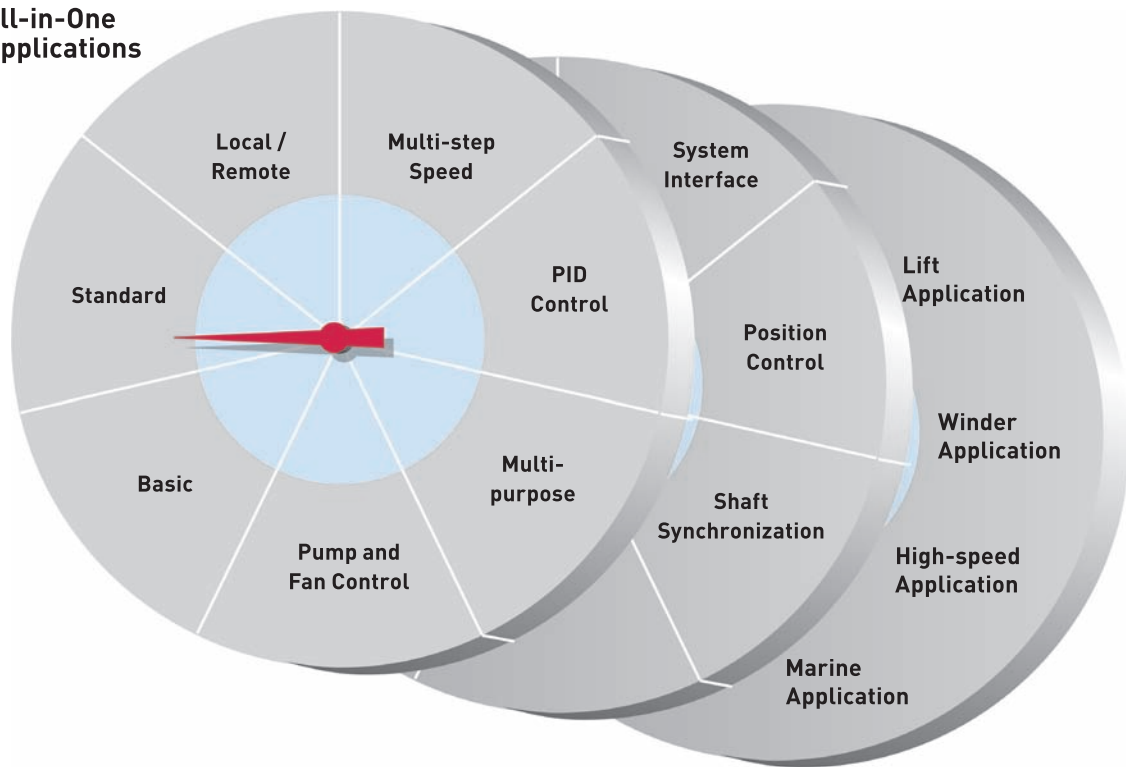
The Vacon NXP features built-in PLC functionality without the need for any additional hardware. Vacon NC61131-3 Engineering can be used to improve performance and create cost savings by integrating customer-specific functionality into the drive.

## SOFTWARE MODULARITY

The All-in-One application package has seven built-in software applications (=default settings and functionality of control inputs and outputs) which can be selected with one parameter.

The Start-up Wizard asks which software application should be used at the first power-up. With this single setting, the drive can be programmed, for example, for two external control places or pressure control with an integrated PID controller.

### All-in-One Applications



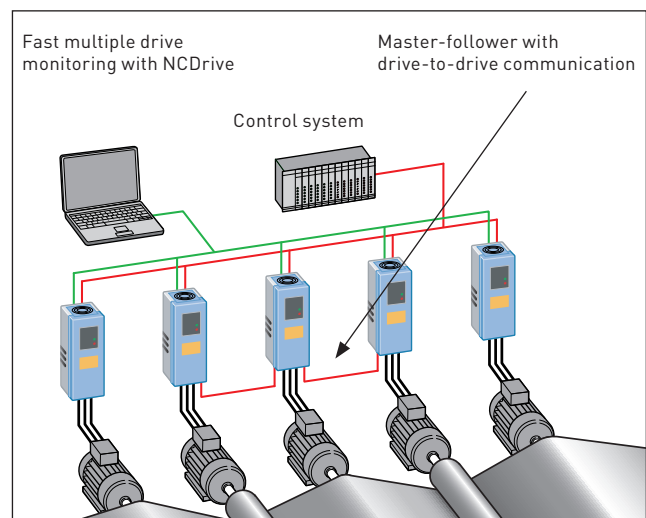
## VACON NXP APPLICATIONS

Instead of the default All-in-One application package, the Vacon NXP can also be equipped with advanced application software. This is designed to meet the requirements of demanding automation applications.

### System Interface Application

The System Interface Application is designed to provide a logical, flexible interface to machine controllers for use in demanding automation applications.

- Flexible fieldbus process data connections
- Flexible speed and torque reference chains
- Adaptive speed controller
- Inertia compensation and oscillation damping features
- Fast drive-to-drive communication for master-follower applications
- Supports permanent magnet motors
- Integrated mechanical brake and motor fan control
- Emergency stop with automatic deceleration

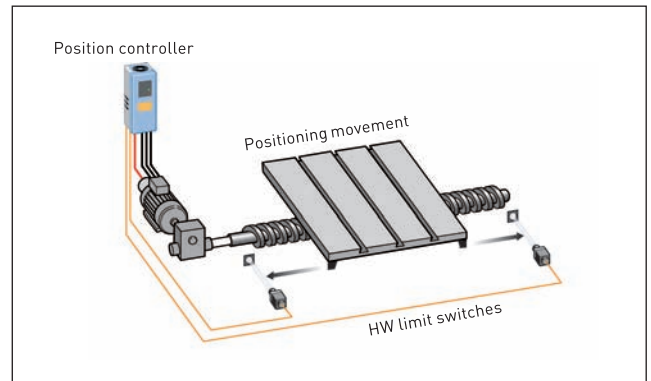


## VACON NXP APPLICATIONS

### Position Control Application

The Position Control Application offers an integrated single-axis interpolating positioning controller for the Vacon NXP.

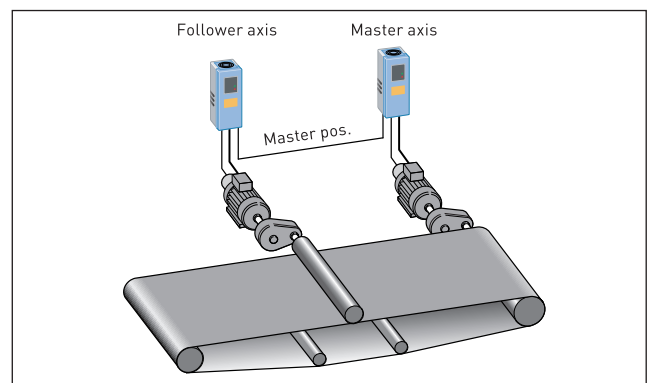
- User-specified units for positions
- Alternative zero calibration cycles
- Home position
- Absolute and relative positioning
- Sequencing
- Hardware- or software-based end limits



### Shaft Synchronization Application

The Shaft Synchronization Application controls the position or the angle of the follower axis directly or in an adjustable ratio to the master axis.

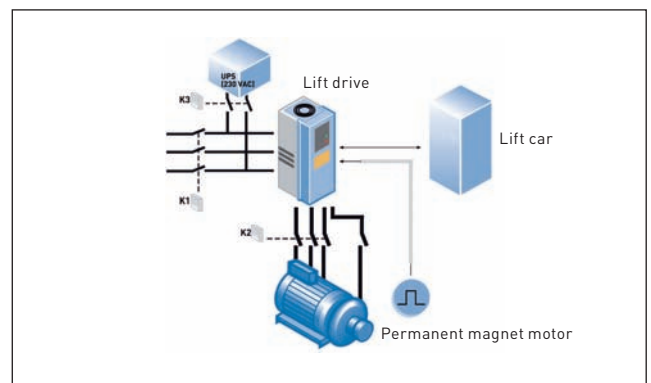
- Master position from secondary encoder input
- Follower position from incremental encoder or resolver
- Adjustable gear ratio
- Trim +/- inputs for ratio change during run



### Lift Application

The Lift Application offers ready-made lift functions for easy commissioning and tuning of a lift.

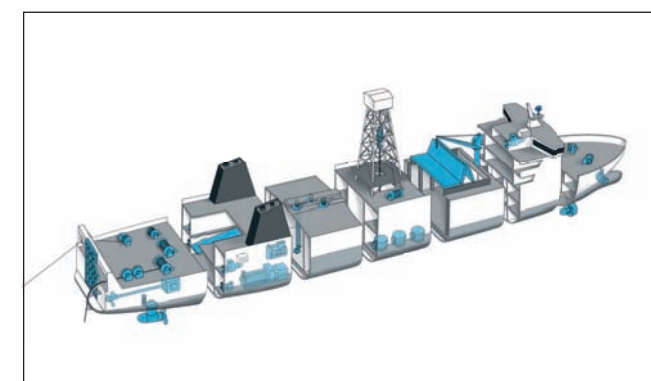
- Induction and permanent magnet motor support
- Lift speed parameters in [Hz] and [m/s]
- Integrated lift brake control logic
- Lift evacuation feature (in case of power failure, the lift can be run to the next floor)
- Built-in motor contactor control logic



### Marine Application

The Marine Application adds support for marine-specific functionality that simplifies the use of the drive in marine systems.

- Fast drive-to-drive communication for speed / load share
- Black-out prevention using fast power limit control
- Full speed and constant power mode control
- Temperature measurement using PT100 sensors
- Built-in brake control logic for winches
- Load drooping

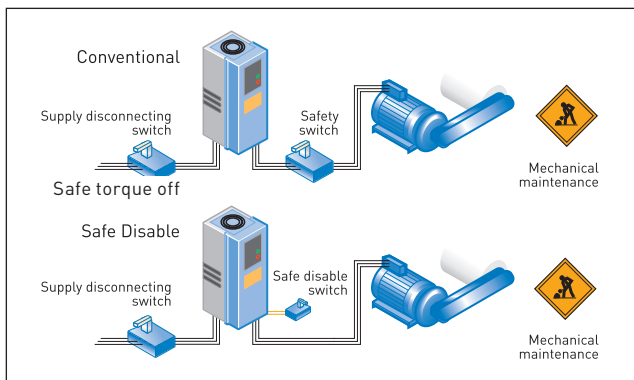


The Vacon NXP can help to increase the safety of a system and reduce complexity by offering integrated safety-related functions in the drive. The need for external components and additional wiring is greatly reduced.

### Safe torque off (STO)

The safety function ensures that the motor will not be driven by the drive, i.e. for safe standstill; for example, when there is a need to perform mechanical maintenance on a machine. In such installations the function may be used to replace mechanical power switches.

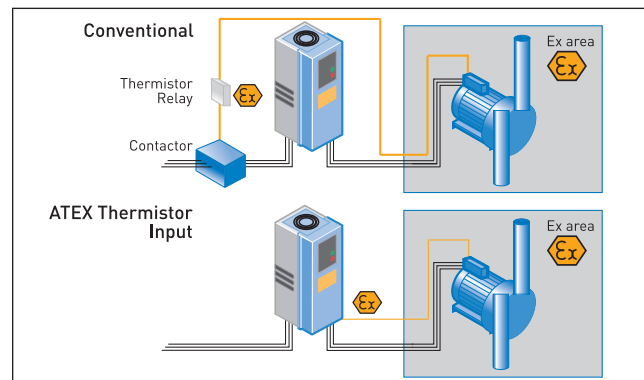
The safety function is certified in accordance with EN 61800-5-2 Safe torque off (SIL2) and EN ISO 13849-1: 2006 (PL.d).



### ATEX-certified motor thermal supervision

The ATEX-certified thermistor input of the Vacon NXP is certified for use in supervising the temperature of Ex motors located in potentially explosive areas. The integrated safety function offers cost savings compared to conventional solutions with external thermistor relays and contactors.

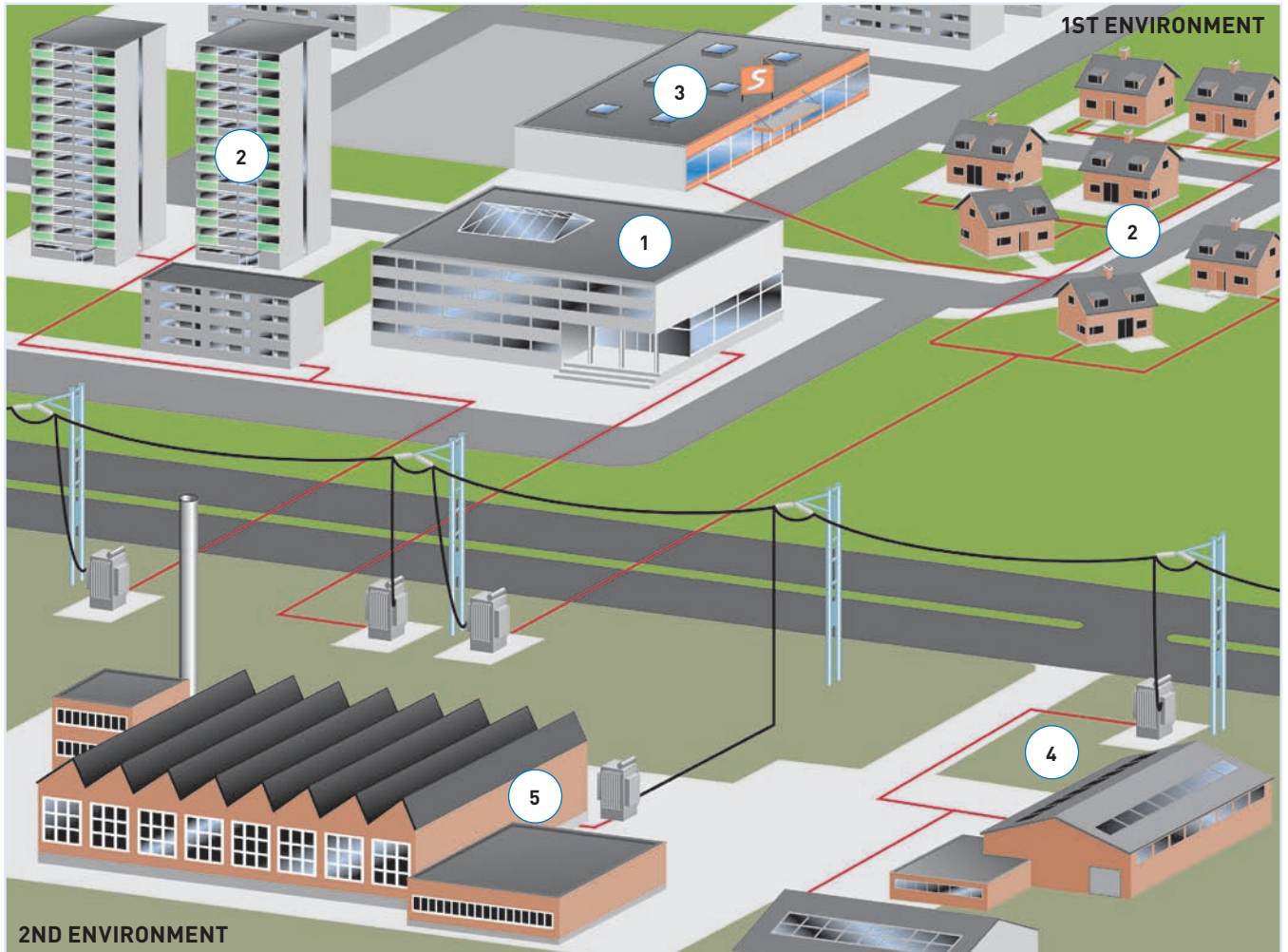
The thermal supervision input is certified to be compliant with the ATEX 94/9/EC directive.



### Safe stop 1 (SS1)

The safety function decelerates the motor and initiates the Safe torque off safety function after a time delay set by the user. The function is certified in accordance with EN 61800-5-2 Safe stop 1 (SIL2) and EN ISO 13849-1: 2006 (PL.d).

**EMC AND INSTALLATION ENVIRONMENT**



The product family standard EN 61800-3 sets limits for both emissions and immunity to radio frequency disturbances. The environment has been divided into the first and second environments; in practice, public and industrial networks, respectively.

Radio Frequency Interference (RFI) filters are typically required to meet the EN 61800-3 standard. These filters are integrated in the Vacon NXP as standard.

The 208–240 V and 380–500 V ranges of the Vacon NXP (FR4-FR9) meet the requirements of the first and second environments (H level: EN 61800-3(2004), category C2). No additional RFI filters or cabinets are required. The FR10-FR14 and the 500-690 V ranges of the Vacon NXP meet the requirements of the second environment (L-level: EN 61800-3(2004), category C3).

The units in the frame sizes FR4, FR5 and FR6 (with a voltage range from 380 to 500 V) are also available with extremely low-emission integrated EMC filters [C level: EN 61800-3 (2004), category C1]. This is sometimes required in very sensitive locations, such as hospitals.

**EMC Selection Table, restricted distribution**

	1	2	3	4	5	
Vacon NXP EMC	Hospital	Residential Area	Commercial	Light Industry Area	Heavy Industry	Marine
C [Category C1]	O					
H [Category C2]	R	R	R	O	O	
L [Category C3]				R	R	
T [Category C4]					R (IT)	R (IT)

R = Required ; O = Optional

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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)

روبروی پالایشگاه نفت پارس، پلاک ۱۲

## TECHNICAL DATA

<b>Mains connection</b>	Input voltage $U_{in}$	208...240 V; 380...500 V; 500...690 V; -10%...+10% NXC low-harmonic drive 525-690 V; -10%...+10%	
	Input frequency	45...66 Hz	
	Connection to mains	Once per minute or less (normal case)	
<b>Motor connection</b>	Output voltage	$0-U_{in}$	
	Continuous output current	High overloadability: $I_H$ , ambient temperature max. +50°C ( $\geq FR10 + 40^\circ C$ ) Low overloadability: $I_L$ , ambient temperature max. +40°C	
	Overloadability	High: $1.5 \times I_H$ (1 min/10 min), Low: $1.1 \times I_L$ (1 min/10 min)	
	Max. starting current	$I_s$ for 2 s every 20 s	
	Output frequency	0...320 Hz	
	<b>Control characteristics</b>	Control performance	Open loop vector control (5-150% of base speed): speed control 0.5%, dynamic 0.3%sec, torque lin. <2%, torque rise time ~5 ms Closed loop vector control (entire speed range): speed control 0.01%, dynamic 0.2% sec, torque lin. <2%, torque rise time ~2 ms
Switching frequency		NX_2/ Up to and including NX_0061: NX_5: 1...16 kHz; Factory default 10 kHz From NX_0072: 1...10 kHz; Factory default 3.6 kHz NX_6: 1...6 kHz; Factory default 1.5 kHz	
Field weakening point		8...320 Hz	
Acceleration time		0...3000 sec	
Deceleration time		0...3000 sec	
Braking		DC brake: $30\% \times T_N$ (without brake resistor), flux braking	
<b>Ambient conditions</b>		Ambient operating temperature	-10°C (no frost)...+50°C: $I_H$ ( $\geq FR10 + 40^\circ C$ ) -10°C (no frost)...+40°C: $I_L$
		Storage temperature	-40°C...+70°C
	Relative humidity	0 to 95% RH, non-condensing, non-corrosive, no dripping water	
	Air quality: - chemical vapours - mechanical particles	IEC 60721-3-3, unit in operation, class 3C2 IEC 60721-3-3, unit in operation, class 3S2	
	Altitude	100% load capacity (no derating) up to 1000 m 1% derating for each 100 m above 1000 m; max. 3000 m (690 V max. 2000 m)	
	Vibration EN 50178/EN 60068-2-6	5...150 Hz: Displacement amplitude 1 mm (peak) at 5...15.8 Hz ( $\geq FR10$ : 0.25 mm (peak) at 5...31 Hz) Max acceleration amplitude 1 G at 15.8...150 Hz ( $\geq FR10$ : 1 G at 31...150 Hz)	
	Shock EN 50178, EN 60068-2-27	UPS Drop Test (for applicable UPS weights) Storage and shipping: max 15 G, 11 ms (in package)	
	<b>EMC</b>	Immunity	Fulfils all EMC immunity requirements
Emissions		<b>EMC level C:</b> EN 61800-3, category C1 <b>EMC level H:</b> EN 61800-3, category C2 <b>EMC level L:</b> EN 61800-3, category C3 <b>EMC level T:</b> Low earth-current solution is suitable for IT networks, (can be modified from L/H-level units)	
<b>Safety</b>		EN 50178, EN 60204-1, IEC 61800-5-1, CE, UL, CUL; (see unit nameplate for more details)	
<b>Control connections (OPT-A1, -A2 or OPT-A1, -A3)</b>	Analogue input voltage	0...+10 V (-10 V...+10 V joystick control), $R_i = 200 \text{ k}\Omega$ , resolution 0.1%, accuracy $\pm 1\%$	
	Analogue input current	0(4)...20 mA, $R_i = 250 \text{ }\Omega$ differential, resolution 0.1%, accuracy $\pm 1\%$	
	Digital inputs	6, positive or negative logic; 18...30 VDC	
	Auxiliary voltage	+24 V, $\pm 15\%$ , max. 250 mA	
	Output reference voltage	+10 V, +3%, max. load 10 mA	
	Analogue output	0(4)...20 mA; $R_L$ max. 500 $\Omega$ , resolution 10 bit, accuracy $\pm 2\%$	
	Digital output	Open collector output, 50 mA/48 V	
	Relay outputs	2 programmable change-over (NO/NC) relay outputs (OPT-A3: NO/NC+NO) Switching capacity: 24 VDC/8 A, 250 VAC/8 A, 125 VDC/0.4 A. Min. switching load: 5 V/10 mA	
	Thermistor input (OPT-A3)	Galvanically isolated, $R_{trip} = 4.7 \text{ k}\Omega$	
<b>Protections</b>		Overvoltage, undervoltage, earth fault, mains supervision, motor phase supervision, overcurrent, unit overtemperature, motor overload, motor stall, motor underload, short-circuit of +24 V and +10 V	

**VACON**  
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[www.vacon.com](http://www.vacon.com)