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VACON NXS
ROBUST DRIVE FOR HEAVY USE

VACON
DRIVEN BY DRIVES

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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.

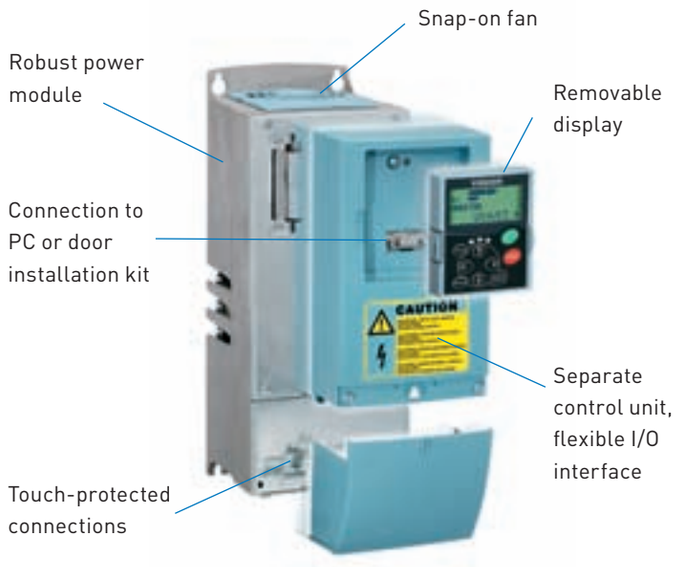
The Start-Up Wizard and the standard All-In-One Application Package make parameter setting extremely easy in all cases, from simple to complex.

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



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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_S	400 V supply			
	Rated continuous current I_L (A)	10% overload current (A)	Rated continuous current I_H (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_S	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)		
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

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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_S	690 V supply			
	Rated continuous current I_L (A)	10% overload current (A)	Rated continuous current I_H (A)	50% overload current (A)		10% overl. P (kW)	50% overl. P (kW)		
NXS 0004 6 A 2 L 0 SSS	4.5	5.0	3.2	4.8	6.4	3	2.2	FR6	195*519*237
NXS 0005 6 A 2 L 0SSS	5.5	6.1	4.5	6.8	9.0	4	3	FR6	195*519*237
NXS 0007 6 A 2 L 0 SSS	7.5	8.3	5.5	8.3	11.0	5.5	4	FR6	195*519*237
NXS 0010 6 A 2 L 0 SSS	10	11.0	7.5	11.3	15.0	7.5	5.5	FR6	195*519*237
NXS 0013 6 A 2 L 0 SSS	13.5	14.9	10	15.0	20.0	11	7.5	FR6	195*519*237
NXS 0018 6 A 2 L 0 SSS	18	19.8	13.5	20.3	27	15	11	FR6	195*519*237
NXS 0022 6 A 2 L 0 SSS	22	24.2	18	27.0	36	18.5	15	FR6	195*519*237
NXS 0027 6 A 2 L 0 SSS	27	29.7	22	33.0	44	22	18.5	FR6	195*519*237
NXS 0034 6 A 2 L 0 SSS	34	37	27	41	54	30	22	FR6	195*519*237
NXS 0041 6 A 2 L 0 SSS	41	45	34	51	68	37.5	30	FR7	237*591*257
NXS 0052 6 A 2 L 0 SSS	52	57	41	62	82	45	37.5	FR7	237*591*257
NXS 0062 6 A 2 L 0 SSS	62	68	52	78	104	55	45	FR8	291*758*344
NXS 0080 6 A 2 L 0 SSS	80	88	62	93	124	75	55	FR8	291*758*344
NXS 0100 6 A 2 L 0 SSS	100	110	80	120	160	90	75	FR8	291*758*344
NXS 0125 6 A 2 L 0 SSF	125	138	100	150	200	110	90	FR9	480*1150*362
NXS 0144 6 A 2 L 0 SSF	144	158	125	188	213	132	110	FR9	480*1150*362
NXS 0170 6 A 2 L 0 SSF	170	187	144	216	245	160	132	FR9	480*1150*362
NXS 0208 6 A 2 L 0 SSF	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_H (1 min/10 min) @ 50°C; Low: 1.1 x I_L (1 min/10 min) @ 40°C; I_S 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_S	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)		
NXS 0261 6 A 2 L 0 SSA	261	287	208	312	375	250	200	FR10	595*2020*602
NXS 0325 6 A 2 L 0 SSA	325	358	261	392	470	315	250	FR10	595*2020*602
NXS 0385 6 A 2 L 0 SSA	385	424	325	488	585	355	315	FR10	595*2020*602
NXS 0416 6 A 2 L 0 SSA*	416	458	325	488	585	400	315	FR10	595*2020*602
NXS 0460 6 A 2 L 0 SSA	460	506	385	578	693	450	355	FR11	794*2020*602
NXS 0502 6 A 2 L 0 SSA	502	552	460	690	828	500	450	FR11	794*2020*602
NXS 0590 6 A 2 L 0 SSA*	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)



FR10



FR11

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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)			230 V supply			
	Rated continuous current I_L (A)	10% overload current (A)	Rated continuous current I_H (A)	50% overload current (A)	Maximum current I_S	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

- Factory installed I/O boards and expanders (slots A, B, C, D and E)
  - C3 = Profibus board OPT-C3 (slot E)
  - 00 = no board (slot D)
  - 00 = no board (slot C)
  - A1 = basic I/O boards OPT-A1 (slot A)
  - A2 = basic output relay board OPT-A2 (slot B)
  - A3 = basic output relay board OPT-A3 (slot B) including thermistor input
- Hardware modifications (power unit, special modifications, board varnishing)
- Brake chopper option:
  - 0 = no brake chopper
  - 1 = internal brake chopper
  - 2 = internal brake chopper and resistor
- Emission level:
  - H = fulfils the standard EN 61800-3 (2004), category C2
  - T = fulfils the standard EN 61800-3 (2004), category C4. Low earth current solution for IT networks
  - L = fulfils the standard EN 61800-3 (2004), category C3
  - C = fulfils the standard EN 61800-3 (2004), category C1
- Enclosure classification:
  - 2 = IP21
  - 5 = IP54
- Control keypad:
  - A = standard alpha-numeric keypad
  - B = no keypad
  - G = graphic keypad (Chinese and Russian letters)
- Nominal mains voltage:
  - 2 = 208...240 V AC (3-phase)
  - 5 = 380...500 V AC (3-phase)
  - 6 = 525...690 V AC (3-phase)
- Nominal current
  - Maximum continuous current of the unit @ 40°C
  - e.g. 0007 = 7 Amps
- Product range:
  - NXS

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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 typecode	Card slot					I / O signal													
	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	NOTE
Basic I/O cards (OPT-A)																				
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 mm² terminals
I/O expander cards (OPT-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	
Fieldbus cards (OPT-C)																				
OPT-C2						RS-485 (Multiprotocol)														Modbus, N2
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)														Modbus, N2
OPT-CI						Modbus/TCP														
OPT-CJ						BACNet														

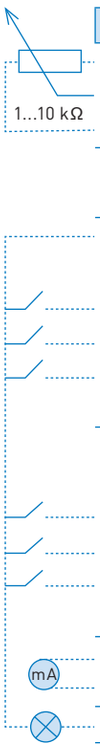
NOTES: Allowed slots for the board are marked in blue.

1) analogue signals galvanically isolated as a group, 2) analogue signals galvanically isolated separately.

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VACON NXS STANDARD I/O

OPT-A1



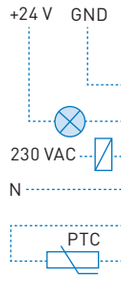
Terminal		Defaults settings	Programmable
1	+10V	Reference voltage	
2	AI1+	Frequency reference 0–10 V	-10–+10 V, 0/4–20 mA
3	AI1-	AI common (GND)	Differential
4	AI2+	Frequency reference 4–20 mA	0–20mA, 0/-10 V–10 V
5	AI2-	AI common (differential)	GND
6	+24V	Control supply (bidirectional)	
7	GND	I/O Ground	
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	Many possibilities
23	R01		
24	R02		
25	R02	FAULT	Many possibilities
26	R02		

OPT-A3 (alternative)



Terminal		Defaults settings	Programmable
21	R01		
22	R01	RUN	Many possibilities
23	R01		
25	R02	FAULT	Many possibilities
26	R02		
28	TI1+	Thermistor	Warning, fault,
29	TI1-	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. NXS02605A**5**H0 (SSS...)
	IP5-FR_	FR4, FR5, FR6	IP54 kit, e.g. IP5-FR4
Through-hole mounting	Factory option	FR4-FR9	E.g. NXS02605A**T**H0S**T**S..., IP54 back, IP21 front, kits available
Integrated brake choppers	Standard	FR4-6/230, 500 V	E.g. NXS00455A2H**1** (SSS...)
	Factory option	FR7-, FR6-/690 V	E.g. NXS02605A2H**1** (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 linearily 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 linearily 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. NXS00455A2H**2** (SSS...) Light duty: 2 sec nominal torque braking from nominal speed decreasing linearily to zero, once per 60 sec.
Graphical display panel	Factory option	All	Replace 'A' by 'G', e.g. NXS00455**G**2H1 (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. NXS00455A2H1SS**V**..., 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. NXS00455A5**C**1 (SSS..)
Du/dt & sinus filters			Available for all drives, contact local Vacon supplier

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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	
AI1	fref	P
AI2	fref	P
DI1	Start forward	
DI2	Start reverse	
DI3	External fault	P
DI4	Speed select 1	
DI5	Speed select 2	
DI6	Fault reset	
AO1	fout	P
DO1	Ready	
RO1	Run	
RO2	Fault	

Suitable for most purposes

Standard

I/O	Defaults	
AI1	fref	P
AI2	fref	P
DI1	Start forward	P
DI2	Start reverse	P
DI3	External fault	P
DI4	Speed select 1	
DI5	Speed select 2	
DI6	Fault reset	
AO1	fout	P
DO1	Ready	P
RO1	Run	P
RO2	Fault	P

Basic, with more programming possibilities

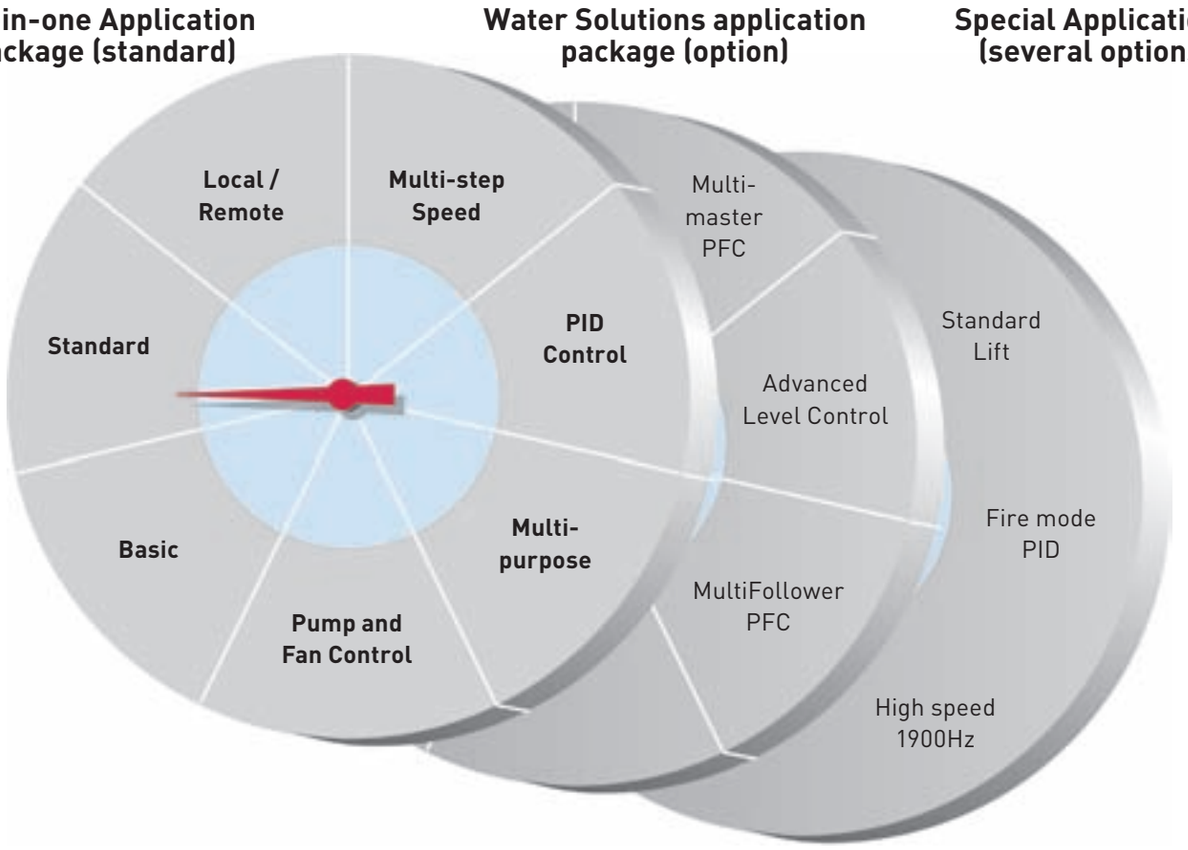
Local/Remote

I/O	Defaults	
AI1	B fref	P
AI2	A fref	P
DI1	A Start forward	P
DI2	A Start reverse	P
DI3	External fault	P
DI4	B Start forward	P
DI5	B Start reverse	P
DI6	A/B selection	
AO1	fout	P
DO1	Ready	P
RO1	Run	P
RO2	Fault	P

Two external control places

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SOFTWARE MODULARITY



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	
AI1	f_{ref}	P
AI2	f_{ref}	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	
AO1	f_{out}	P
DO1	Ready	P
RO1	Run	P
RO2	Fault	P

16 fixed speeds

PID Control

I/O	Defaults	
AI1	PID reference	P
AI2	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	
AO1	f_{out}	P
DO1	Ready	P
RO1	Run	P
RO2	Fault	P

When PID is required

Multi-purpose Control

I/O	Defaults	
AI1	f_{ref}	P
AI2	f_{ref}	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
AO1	f_{out}	P
DO1	Ready	P
RO1	Run	P
RO2	Fault	P

Most flexible of all

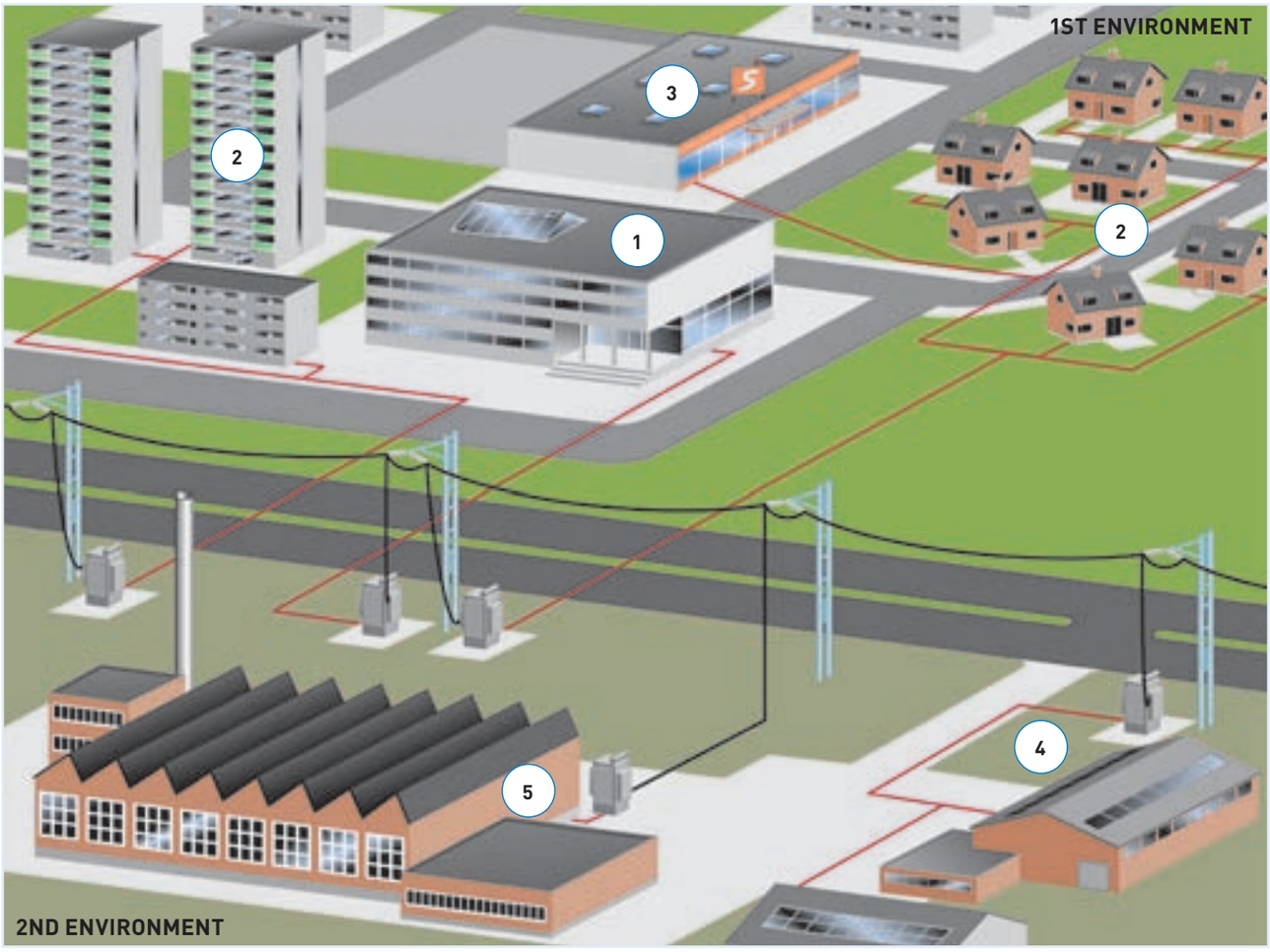
Pump and Fan Control

I/O	Defaults	
AI1	PID reference	P
AI2	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
AO1	f_{out}	P
DO1	Fault	P
RO1	Autochange 1	P
RO2	Autochange 2	P

Control of up to five pumps with auto-change

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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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Mains connection	Input voltage U_{in}	208...240 V; 380...500 V; 525...690 V; (–15%...+10%)
	Input frequency	50...60 Hz (± 10%)
	Connection to mains	Once per minute or less (normal case)
Motor connection	Output voltage	0—U_{in}
	Continuous output current	High overloadability: I_H Low overloadability: I_L
	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; up to 7200 Hz with special software
	Frequency resolution	0.01 Hz
Control characteristics	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
Ambient conditions	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
EMC	Immunity	Fulfil all EMC immunity requirements
	Emissions	**EMC level C**: EN61800-3 (2004), category C1 **EMC level H**: EN61800-3 (2004), category C2 **EMC level L**: EN61800-3 (2004), category C3 **EMC level T**: Low earth-current solution suitable for IT networks, EN61800-3 (2004), category C4
Safety		EN 50178 (1997), EN 60204-1 (2006), IEC 61800-5, CE, UL, CUL; (see unit nameplate for more detailed approvals)
Control connections (OPT-A1, -A2 or OPT-A1, -A3)	Analogue input voltage	0...+10 V (–10 V...+10 V joystick control), R_i = 200 kΩ, resolution 0.1%, accuracy ±1%
	Analogue input current	0(4)...20 mA, R_i = 250 Ω differential, resolution 0.1%, accuracy ±1%
	Digital inputs	6, positive or negative logic; 18...30 VDC
	Auxiliary voltage	+24 V, ±15%, max. 250 mA
	Output reference voltage	+10 V, +3%, max. load 10 mA
	Analogue output	0(4)...20 mA; R_L max. 500 Ω, resolution 10 bit, accuracy ±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 kΩ
Protections		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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