

VACON[®]

DRIVEN BY DRIVES



norwatt@norwatt.es

www.norwatt.es

VACON[®] **NXS**

ROBUST DRIVE FOR HEAVY USE



THE RELIABLE CHOICE

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, 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





RATINGS AND 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 | 22 | 15 | FR6 | 195*519*237 | |
| NXS 0045 5 A 2 H 1 SSS | 46 | 51 | 38 | 57 | 76 | 22 | 22 | 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*2018*602 | |
| NXS 0460 5 A 2 L 0 SSA | 460 | 506 | 385 | 578 | 693 | 250 | 200 | FR10 | 595*2018*602 | |
| NXS 0520 5 A 2 L 0 SSA* | 520 | 572 | 460 | 690 | 828 | 250 | 250 | FR10 | 595*2018*602 | |
| NXS 0590 5 A 2 L 0 SSA | 590 | 649 | 520 | 780 | 936 | 315 | 250 | FR11 | 794*2018*602 | |
| NXS 0650 5 A 2 L 0 SSA | 650 | 715 | 590 | 885 | 1062 | 355 | 315 | FR11 | 794*2018*602 | |
| NXS 0730 5 A 2 L 0 SSA | 730 | 803 | 650 | 975 | 1170 | 400 | 355 | FR11 | 794*2018*602 | |

* max. ambient temperature of +35°C

RATINGS AND DIMENSIONS

Mains voltage 500-690 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 0 SSS | 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 500-690 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*2018*602 | |
| NXS 0325 6 A 2 L 0 SSA | 325 | 358 | 261 | 392 | 470 | 315 | 250 | FR10 | 595*2018*602 | |
| NXS 0385 6 A 2 L 0 SSA | 385 | 424 | 325 | 488 | 585 | 355 | 315 | FR10 | 595*2018*602 | |
| NXS 0416 6 A 2 L 0 SSA* | 416 | 458 | 325 | 488 | 585 | 400 | 315 | FR10 | 595*2018*602 | |
| NXS 0460 6 A 2 L 0 SSA | 460 | 506 | 385 | 578 | 693 | 450 | 355 | FR11 | 794*2018*602 | |
| NXS 0502 6 A 2 L 0 SSA | 502 | 552 | 460 | 690 | 828 | 500 | 450 | FR11 | 794*2018*602 | |
| NXS 0590 6 A 2 L 0 SSA* | 590 | 649 | 502 | 753 | 904 | 560 | 500 | FR11 | 794*2018*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) |



RATINGS AND DIMENSIONS

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 _S | 230 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 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 | 22 | 15 | FR7 | 237*591*257 |
| NXS 0088 2 A 2 H 0 SSS | 88 | 97 | 75 | 113 | 150 | 22 | 22 | 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 |

TYPE CODE KEY

| VACON - NXS - 0003 - 5 - A - 2 - H - 1 - S - S - S - A1 A2 00 00 00 | |
|---|--|
| NXS | Product Range VACON NXS |
| 0003 | Current Rating (Low Overload) Ex: 0003 = 3A |
| 5 | Supply Voltage 2 = 208-240V Three Phase 5 = 380-500V Three Phase 6 = 500-690V Three Phase |
| A | Keypad Option A = Standard Alpha-Numeric Display B = No Keypad F = Dummy Keypad (No interface) G = Graphical Display (Cyrillic Languages) |
| 2 | Enclosure Class 2 = IP21/UL Type 1 5 = IP54/UL Type 12 T = Flange Mounting Factory Installed |
| H | EMC Emission Levels H = fulfils the standard EN/IEC 61800-3 + A1, category C2 T = fulfils the standard EN/IEC 61800-3 + A1, category C4 * L = fulfils the standard EN/IEC 61800-3 + A1, category C3 C = fulfils the standard EN/IEC 61800-3 + A1, category C1 |
| 1 | Brake Chopper 0 = No Brake Chopper 1 = Integrated Brake Chopper 2 = Integrated Brake Chopper + Brake Resistor |
| S | Electrical Modifications S = Standard 6-Pulse w/ Integrated Choke B = DC Bus Connection |
| S | Mechanical Modifications S = Standard Air Cooled Drive G = Standard Air Cooled Drive, No Conduit Box* |
| S | Card Modifications S = Standard Connection / Not Varnished V = Standard Connection / Varnished Boards |
| A1 A2 00 00 00 | Option Boards (Installed) Each Two-digit code represents a card slot in order from left to right, Slot A, Slot B, Slot C, Slot D, Slot E A = Basic I/O Cards B = I/O Expansion Cards C = Communications Cards D = Special Option Cards |

* Low earth current solution for IT networks

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 | | | | | | | | | | | | | | 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 | | |
| 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 mm ² 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 | |
| OPT-CP | | | | | | | | | | | | | | | | | | | | ProfiNet I/O (Ethernet) | |
| OPT-CQ | | | | | | | | | | | | | | | | | | | | Ethernet I/P (Ethernet) | |

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

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

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, $I \leq 50$ mA, $U \leq 48$ VDC | Many possibilities |

OPT-A2

| Terminal | Defaults settings | Programmable |
|----------|-------------------|--------------------|
| 21 R01 | RUN | Many possibilities |
| 22 R01 | | |
| 23 R01 | | |
| 24 R02 | FAULT | Many possibilities |
| 25 R02 | | |
| 26 R02 | | |

OPT-A3 (alternative)

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

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- / 230 V, 500 V 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 500-690 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 |

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



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.

VACON® PC tools are available for download through our website at www.vacon.com.

VACON PC TOOLS INCLUDE

- VACON NCDrive for parameter setting, copying, storing, printing, monitoring and controlling
- VACON® Programming tool is available for making tailor-made software. A license key and training required.
- VACON NCLoad for software updating and uploading special software to the drive
- 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 |
| DI1 | Start forward | |
| DI2 | Start reverse | |
| DI3 | External fault | P |
| DI4 | Speed select 1 | |
| DI5 | Speed select 2 | |
| DI6 | 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 |
| DI1 | Start forward | P |
| DI2 | Start reverse | P |
| DI3 | External fault | P |
| DI4 | Speed select 1 | |
| DI5 | Speed select 2 | |
| DI6 | 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 |
| 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 | |
| A01 | fout | P |
| D01 | Ready | P |
| R01 | Run | P |
| R02 | Fault | P |

Two external control places

Multi-step Speed Control

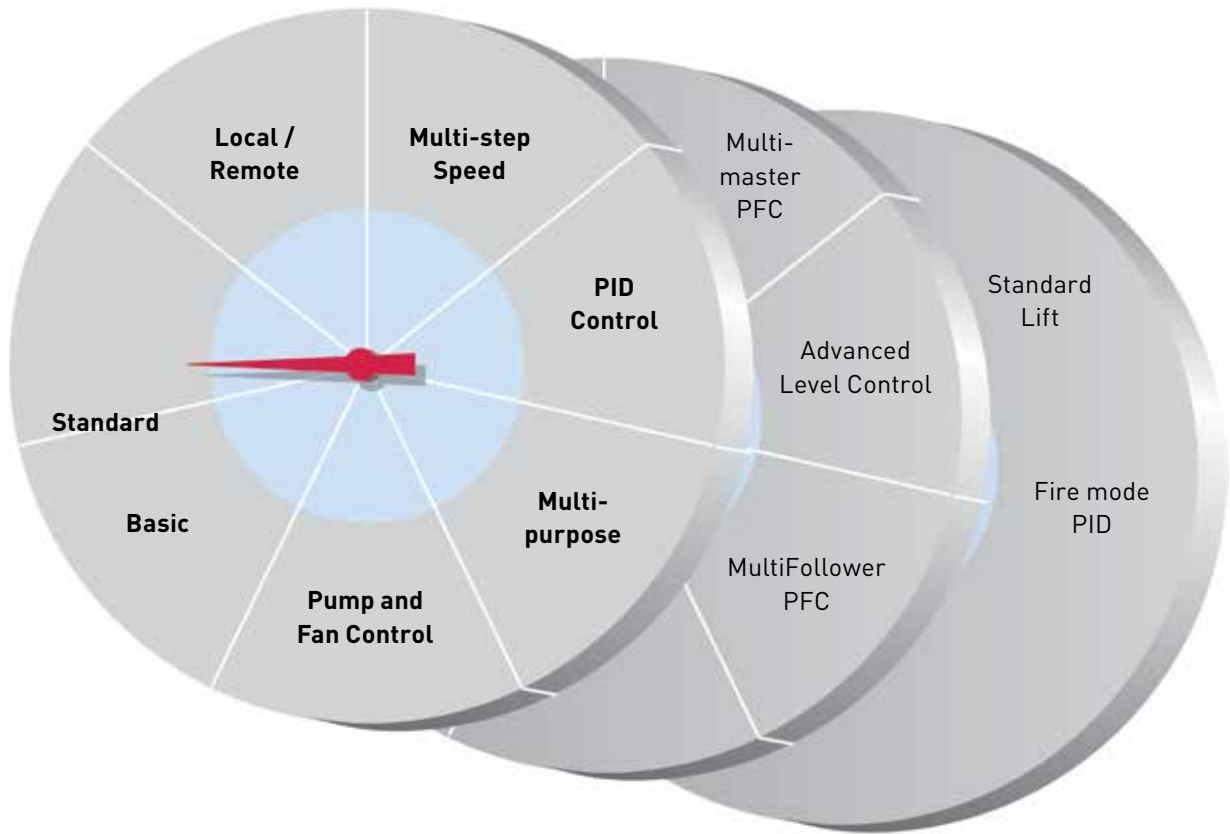
| I/O | Defaults | |
|-----|----------------|---|
| A11 | fref | P |
| A12 | fref | P |
| DI1 | Start forward | P |
| DI2 | Start reverse | P |
| DI3 | External fault | P |
| DI4 | Speed select 1 | |
| DI5 | Speed select 2 | |
| DI6 | Speed select 3 | |
| A01 | fout | P |
| D01 | Ready | P |
| R01 | Run | P |
| R02 | Fault | P |

16 fixed speeds

All-in-one Application package (standard)

Water Solutions application package (option)

Special Applications (several options)



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 Programming tool (based on IEC 61131 standard), 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

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 | fout | P |
| D01 | Ready | P |
| R01 | Run | P |
| R02 | Fault | P |

When PID is required

Multi-purpose Control

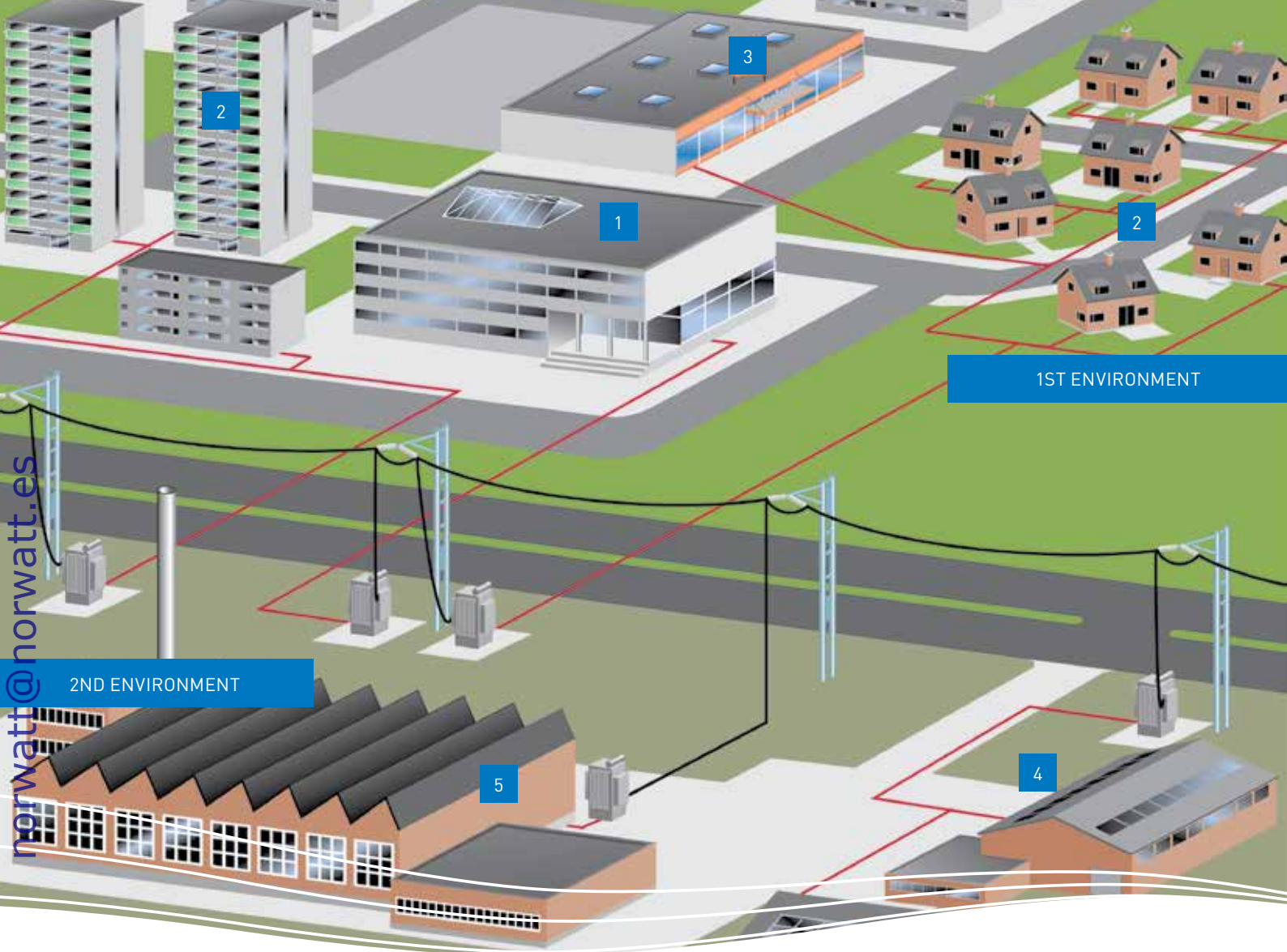
| I/O | Defaults | |
|-----|------------------|---|
| A11 | f _{ref} | P |
| A12 | f _{ref} | P |
| DI1 | Start forward | P |
| DI2 | Start reverse | P |
| DI3 | Fault reset | P |
| DI4 | Jog speed sel | P |
| DI5 | External fault | P |
| DI6 | Acc/dec time sel | P |
| A01 | f _{out} | P |
| D01 | Ready | 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 _{out} | P |
| D01 | Fault | P |
| R01 | Autochange 1 | P |
| R02 | Autochange 2 | P |

Control of up to five pumps with auto-change



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EMC AND INSTALLATION ENVIRONMENT

The product family standard EN/IEC 61800-3 + A1 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 EN/IEC 61800-3 + A1 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:

EN/IEC 61800-3 + A1, category C2). No additional RFI filters or cabinets are required. The FR10–FR11 and the 500–690 V range of the VACON NXS fulfills the requirements of the 2nd environment (L-level: EN/IEC 61800-3 + A1, 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: EN/IEC 61800-3 + A1, 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

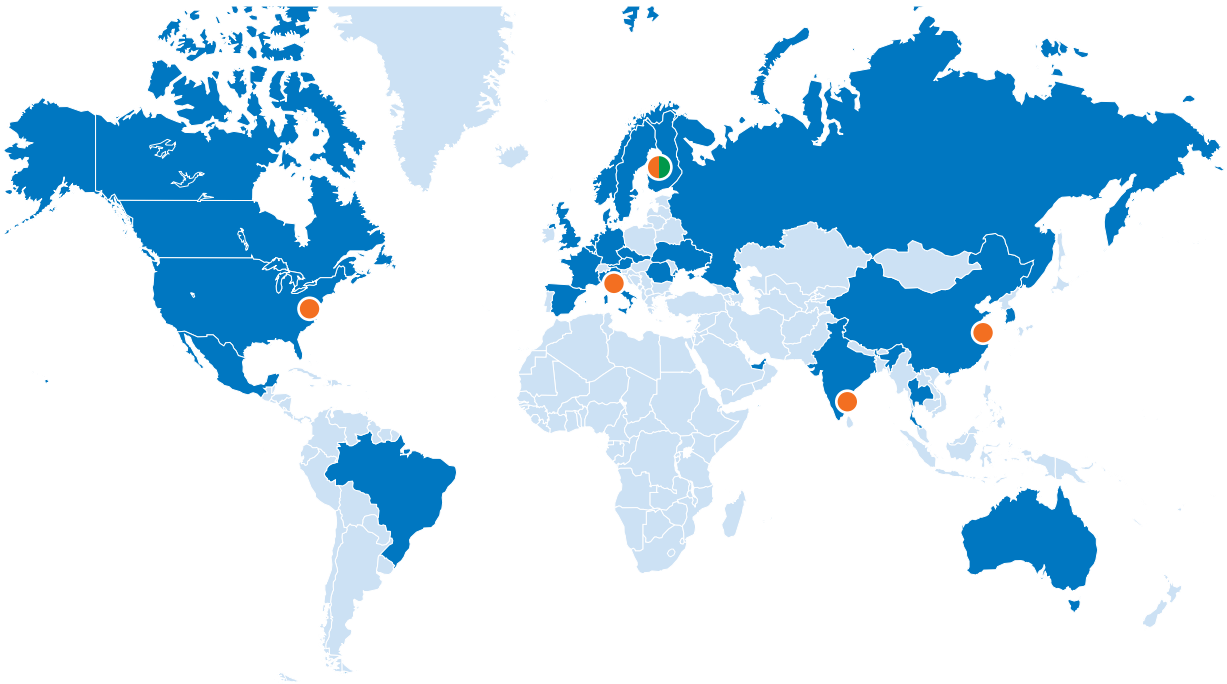
| | | |
|--------------------------------|--|---|
| Mains connection | Input voltage U_{in} | 208...240 V; 380...500 V; 500-690 V; [-10%...+10%] |
| | Input frequency | 50...60 Hz ($\pm 10\%$) |
| | Connection to mains | Once per minute or less (normal case) |
| Motor connection | Output voltage | 0— U_{in} |
| | Continuous output current | High overloadability: I_H Low overloadability: I_L |
| | Overloadability | High: $1.5 \times I_H$ (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 |
| | 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...6 kHz; Factory default: 3.6 kHz FR10-11: 1...6 kHz; Factory default: 3.6 kHz 500-690 V: FR4-11: 1...6 kHz, Factory default: 1.5 kHz |
| | Field weakening point | 8...320 Hz |
| | Acceleration time | 0.1...3000 sec |
| | Deceleration time | 0.1...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 0520 5, 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 (max. 2000 m for 690 V) |
| | Vibration EN/IEC 60068-2-6 | 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 EN/IEC 60068-2-27 | 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: EN/IEC 61800-3 + A1, category C1 EMC level H: EN/IEC 61800-3, + A1 category C2 EMC level L: EN/IEC 61800-3, + A1 category C3 EMC level T: Low earth-current solution suitable for IT networks, EN61800-3 + A1, category C4 |
| Safety | | EN/IEC 61800-5-1, 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], $R_i = 200 \text{ k}\Omega$, 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, $\pm 10\%$, 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 $\pm 2\%$ |
| | 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, $R_{trip} = 4.7 \text{ k}\Omega$ | |
| 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 |

VACON AT YOUR SERVICE

Vacon is driven by a passion to develop, manufacture and sell the best AC drives and inverters in the world — and to provide customers with efficient product life-cycle services. Our AC drives offer optimum process control and energy efficiency for electric motors. Vacon inverters play a key role when energy is produced from renewable sources. Vacon has production and R&D facilities in Europe, Asia and North America, and sales and service operations in nearly 90 countries.

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norwatt@norwatt.es

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