

# WE ARE DRIVES



**VACON® X SERIES**

**RUGGED DRIVES FOR  
THE REAL WORLD**



VACON®  
X SERIES



## THE TOUGHEST AC DRIVES ON THE PLANET!

The Vacon X Series Drives are designed for the REAL world - a world that is not gentle or forgiving to electronic devices. They have been designed to keep driving in harsh environments and are built from the ground up to survive hostile conditions and still be simple to use. They are built to be mounted where the work is, not hidden in another enclosure or room that adds costs and space.

### ROBUST AND RELIABLE

The same enclosures that can survive in the harsh industrial world makes them ideal when cleanliness is extremely important, such as the Food and Beverage industry where high pressure washings are needed on a regular basis. The Vacon X Series drives, through 100 HP, exceed the specifications of their rated UL Type 4X / IP66 Indoor and Outdoor rated enclosures, each being able to withstand high pressure washdown of 1000 PSI from 12" away. The Vacon X Series drives are also packed with advanced control and operation features that make them the best choice for everything from simple, stand-alone applications to advanced system-level controls.

### SIMPLE AND FLEXIBLE

The Vacon X Series drives also boast the easiest programming and operation in the industry. The

bright, clear, backlit display provides an easy to read and customizable view for operation and programming. The Vacon X Series keypad has large, well marked buttons to control all aspects of the drive operation and programming.

The Vacon X4 has the toughness and features to handle most industrial jobs with ease. If the application is more unique, the X5 accepts option boards, has a USB interface, fully coated PC boards for added protection and other advanced features such as a real-time-clock.

A tough enclosure, an easy to read display, simple programming and the confidence of knowing you can mount the drive almost anywhere make the Vacon X Series the only choice for the most demanding environments.





## NEW TO VACON X SERIES

### 230VAC SINGLE PHASE INPUT

The VACON X4 and VACON X5 now feature a best in class, out-of-the-box, single phase 230VAC input product offering with standard output powers of 5HP, 10HP and 15HP (230V 3-Phase AC). These new offerings provide all the benefits of the VACON X Series family including the most robust UL Type 4X, Indoor/Outdoor, rated enclosure with the ease of use and flexibility you've come to know and trust.

### NEW ENCLOSURE RATING FOR FRAME 5

Just when you thought the VACON X Series couldn't possibly stand up to any more of a beating, we go ahead and make the Frame 5 even more robust. From 125HP through 200HP, the VACON X Series can now be placed outside in the elements with the new UL Type 3R, Indoor/Outdoor rating. For the first time, EVERY VACON X Series can be placed outside in the elements, allowing for even greater mounting flexibility without having to spend even one cent more on installation costs.

### VACON X4 / X5

Features	Description	Benefits
Robust Enclosure	The VACON X Series features a best in class UL Type 4X, Indoor/Outdoor certified enclosure through 100HP	<ul style="list-style-type: none"> <li>• Reduced Installation Cost</li> <li>• High Reliability</li> </ul>
Integrated Brake Resistor	Each VACON X Series includes a Brake resistor allowing it to better handle high inertial loads and warm up in cold conditions	<ul style="list-style-type: none"> <li>• Reduced Installation Costs</li> <li>• Mount in Low Temperatures</li> </ul>
Built-in Sequencer	The VACON X Series features a built-in multi-step sequencer that can replace a small PLC in many applications	<ul style="list-style-type: none"> <li>• Reduced investment costs</li> <li>• Flexible application programming</li> </ul>

## WHAT'S IN IT FOR YOU

## STANDARD VACON X SERIES FEATURES



### TOUGHEST PACKAGING

The VACON X Series is the toughest drive on the market today. Featuring an incredibly robust design with (low failure rate), the VACON X Series can truly be mounted where it is needed the most.

- Thick injected foam and metal covers protect against bumps and misuse
- Withstands 1,000 PSI washdown from 6 inches away on models through 30 HP
- Withstands 1000 PSI washdown from 12 inches away on models through 100HP
- Mounts close to the motor to eliminate long motor lead problems



### INDOOR OR OUTDOOR

Each drive in the VACON X Series features a built-in braking resistor that not only allows the VACON X Series to handle higher inertial loads out of the box, but allows it to warm itself up in even the coldest conditions. Add to this the standard UL-approved Outdoor Rating found on every frame size and you have a one-two punch that just can't be beat.

- UL Type 4X / IP66 Indoor and Outdoor rated enclosures through 100 HP
- UL Type 3R / IP55 Indoor and Outdoor rated enclosures for 125 HP and above
- Dynamic Braking resistors included as standard
- ARCTIC Mode maintains safe operating temperature in cold locations



### EASY TO USE

The VACON X Series features a user-friendly keypad which makes operation simple. The easy-to-read display communicates operational status information as well as parameter names and settings in a clear, plain text, format making navigation and programming easier than ever.

- Simple intuitive programming with color coded buttons
- Multi-language display – no codes to learn
- Two parameter levels eases simple application programming
- Application Macros make set-up a breeze



### VERSATILE PROGRAMMING

Not only does the VACON X Series feature a robust and reliable enclosure, it also brings with it a level of versatility to meet almost any application requirements. By including features such as Modbus RTU, a multi-step PLC-like sequencer and plenty of dedicated and programmable I/O, the VACON X Series helps to reduce the overall system investment costs.

- Operate from keypad, remote I/O, fieldbus communications or any combination
- Built-in 9-step PLC functions (25-step with X5)
- Modbus RTU as standard fieldbus communications

## INTEGRATED USB PORT

The VACON X5 control platform includes a USB port as standard for functions like parameter saving, firmware updating and using the built-in data-logger function.

- Parameter Save / Recall
- Save parameter set to USB stick and upload to another drive
- Stored data easily opened with Microsoft Excel
- Ability to define custom file name (numbers or text)
- Easy firmware upgrades using standard USB memory stick
- Collect real time data and event logs



## OPTION CARD SUPPORT

In an ever changing world, a drive must be ready to support newer technologies as well as maintain a level of compatibility with established technology. The VACON X5 easily walks this line through the addition of support for several communications option cards that include built-in 115V I/O and an encoder input for high demand applications.

- DeviceNet, Ethernet IP, Profibus and Modbus TCP option cards are available to supplement the built in Modbus RTU
- All option cards include five channels of 115VAC control inputs and offer a shaft mounted encoder interface
- An option card is available with a dedicated encoder interface



## REAL-TIME CLOCK

By adding a real-time clock to the VACON X5, the information received from the drive is not only much more useful, but many of the functions in the drive are further expanded for greater time based control.

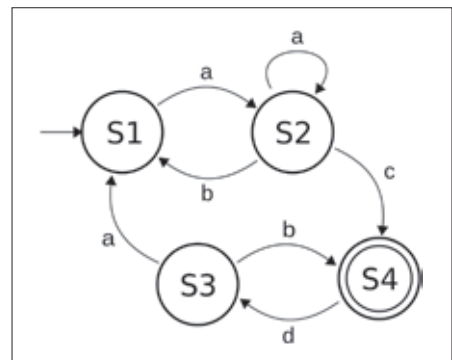
- Time and date stamped Fault Information
- Keeper Function — logs time-based data from external or internal signals
- Data read via serial communication or transferred to USB Memory Stick
- Control operation based on time-of-day. Separate weekday and weekend settings available
- Signals an event via text on the display or contact closure, independent of drive operation



## ENHANCED PROGRAM SEQUENCER

The VACON X5 features an enhanced 25-step programmable sequencer that unlocks even more PLC-like capabilities than the 9-step sequencer of the VACON X4. This allows an unprecedented level of built-in control that helps to reduce investment costs and increase efficiency.

- Create up to 4 independent groups of steps for ultimate flexibility
- New loop and branch capabilities available
- Real Time Clock — time-of-day (TOD) enable function, allows programmed operation to specific periods of the day or week



## X-SERIES I/O

Terminal	Description
FWD	Run Forward Selection
REV	Run Reverse Selection
R/J	Run/Jog Selection
DI1	Digital Input 1
DI2	Digital Input 2
DI3	Digital Input 3
DI4	Digital Input 4
DI5	Digital Input 5
MOL	External Motor Overload
+24V	24V Bus for Digital Inputs
+10V	10V Bus for Analog Inputs
Vin1	Analog Input (Voltage)
Acom	Analog Common (Ground)
Cin+	Current Input
Cin-	Current Input
Imet	Analog Output (Current)

Terminal	Description
Acom	Analog Common (Ground)
Vmet	Analog Output (Voltage)
NO1	Relay 1 Normally Open
RC1	Relay 1 Common
NC1	Relay 1 Normally Closed
NO2	Relay 2 Normally Open
RC2	Relay 2 Common
NC2	Relay 2 Normally Closed
Dcom	Digital Common (Ground)
EN	Drive Enable Terminal
+24V	24V Bus for Digital Inputs
+24V	24V Bus for Digital Inputs
Dcom	Digital Common (Ground)
DO1	Digital Output 1
DO2	Digital Output 2
DOP	Pulse Train Digital Output

## PRODUCT RANGE

### VACON X SERIES 115 VAC 1-PH

Product Code		Motor Shaft Power and Current						Frame Size	Dimensions W x H x D (mm) W x H x D (in)	Weight (kg) Weight (lbs)
Vacon X4	Vacon X5	High Overload (150%)			Low Overload (120%)					
		HP	kW	Amps	HP	kW	Amps			
---	VACONX5C1S010C	0.5	0.37	2.2	1	0.75	4.2	F1A	221 x 306 x 216 8.72 x 12.01 x 8.49	6.35 14
VACONX4C1S010C	VACONX5C1S010C09	0.5	0.37	2.2	1	0.75	4.2	F0	165 x 241 x 155 6.5 x 9.47 x 6.08	3.85 8.5

### VACON X SERIES 200-230 VAC 1-PH

Product Code		Motor Shaft Power and Current						Frame Size	Dimensions	Weight (kg)
Vacon X4	Vacon X5	High Overload (150%)			Low Overload (120%)				W x H x D (mm)	Weight (lbs)
		HP	kW	Amps	HP	kW	Amps		W x H x D (in)	
---	VACONX5C2S050C	3	2.2	9.6	5	4	15.2	F1A	221 x 306 x 216 8.72 x 12.01 x 8.49	6.35 14
---	VACONX5C2S100C	7.5	5.5	22	10	7.5	28	F2A	273 x 442 x 251 10.75 x 17.38 x 9.89	13.38 29.5
VACONX4C2S050C	---	3	2.2	9.6	5	4	15.2	F1	221 x 306 x 166 8.72 x 12.01 x 6.51	6.35 14
VACONX4C2S100C	---	7.5	5.5	22	10	7.5	28	F2	273 x 442 x 201 10.75 x 17.38 x 7.91	13.38 29.5
VACONX4C2S150C	VACONX5C2S150C	10	7.5	28	15	11	42	F3	286 x 513 x 314 11.19 x 20.19 x 11.73	22.68 50

### VACON X SERIES 200-230 VAC 3-PH

Product Code		Motor Shaft Power and Current						Frame Size	Dimensions W x H x D (mm) W x H x D (in)	Weight (kg) Weight (lbs)
Vacon X4	Vacon X5	High Overload (150%)			Low Overload (120%)					
		HP	kW	Amps	HP	kW	Amps			
---	VACONX5C20010C	0.5	0.37	2.2	1	0.75	4.2	F1A	221 x 306 x 216 8.72 x 12.01 x 8.49	6.35 14
---	VACONX5C20020C	1	0.75	4.2	2	1.5	6.8			
---	VACONX5C20030C	2	1.5	6.8	3	2.2	9.6			
---	VACONX5C20050C	3	2.2	9.6	5	4	15.2			
---	VACONX5C20075C	5	4	15.2	7.5	5.5	22			
---	VACONX5C20100C	7.5	5.5	22	10	7.5	28	F2A	273 x 442 x 251 10.75 x 17.38 x 9.89	13.38 29.5
---	VACONX5C20150C	10	7.5	28	15	11	42			
VACONX4C20010C	VACONX5C20010C09	0.5	0.37	2.2	1	0.75	4.2	F0	165 x 241 x 155 6.5 x 9.47 x 6.08	3.85 8.5
VACONX4C20020C	VACONX5C20020C09	1	0.75	4.2	2	1.5	6.8			
VACONX4C20030C	VACONX5C20030C09	2	1.5	6.8	3	2.2	9.6	F1	221 x 306 x 166 8.72 x 12.01 x 6.51	6.35 14
VACONX4C20050C	VACONX5C20050C09	3	2.2	9.6	5	4	15.2			
VACONX4C20075C	VACONX5C20075C09	5	4	15.2	7.5	5.5	22			
VACONX4C20100C	VACONX5C20100C09	7.5	5.5	22	10	7.5	28	F2	273 x 442 x 201 10.75 x 17.38 x 7.91	13.38 29.5
VACONX4C20150C	VACONX5C20150C09	10	7.5	28	15	11	42			
VACONX4C20200C	VACONX5C20200C	15	11	42	20	15	54	F3	286 x 513 x 314 11.19 x 20.19 x 11.73	22.68 50
VACONX4C20250C	VACONX5C20250C	20	15	54	25	18.5	68			



VACON X SERIES 380-480 VAC 3-PH

Product Code		Motor Shaft Power and Current						Frame Size	Dimensions W x H x D (mm) W x H x D (in)	Weight (kg) Weight (lbs)
Vacon X4	Vacon X5	High Overload (150%)			Low Overload (120%)					
		HP	kW	Amps	HP	kW	Amps			
---	VACONX5C40010C	0.5	0.37	1.1	1	0.75	2.1	F1A	221 x 306 x 216 8.72 x 12.01 x 8.49	6.35 14
---	VACONX5C40020C	1	0.75	2.1	2	1.5	3.4			
---	VACONX5C40030C	2	1.5	3.4	3	2.2	4.8			
---	VACONX5C40050C	3	2.2	4.8	5	4	7.6			
---	VACONX5C40075C	5	4	7.6	7.5	5.5	11			
---	VACONX5C40100C	7.5	5.5	11	10	7.5	14	F2A	273 x 442 x 251 10.75 x 17.38 x 9.89	13.38 29.5
---	VACONX5C40150C	10	7.5	14	15	11	21			
---	VACONX5C40200C	15	11	21	20	15	27			
---	VACONX5C40250C	20	15	27	25	18.5	34			
---	VACONX5C40300C	25	18.5	34	30	22	40			
VACONX4C40010C	VACONX5C40010C09	0.5	0.37	1.1	1	0.75	2.1	F0	165 x 241 x 155 6.5 x 9.47 x 6.08	3.85 8.5
VACONX4C40020C	VACONX5C40020C09	1	0.75	2.1	2	1.5	3.4			
VACONX4C40030C	VACONX5C40030C09	2	1.5	3.4	3	2.2	4.8			
VACONX4C40050C	VACONX5C40050C09	3	2.2	4.8	5	4	7.6	F1	221 x 306 x 166 8.72 x 12.01 x 6.51	6.35 14
VACONX4C40075C	VACONX5C40075C09	5	4	7.6	7.5	5.5	11			
VACONX4C40100C	VACONX5C40100C09	7.5	5.5	11	10	7.5	14			
VACONX4C40150C	VACONX5C40150C09	10	7.5	14	15	11	21	F2	273 x 442 x 201 10.75 x 17.38 x 7.91	13.38 29.5
VACONX4C40200C	VACONX5C40200C09	15	11	21	20	15	27			
VACONX4C40250C	VACONX5C40250C09	20	15	27	25	18.5	34			
VACONX4C40300C	VACONX5C40300C09	25	18.5	34	30	22	40			
VACONX4C40400C	VACONX5C40400C	30	22	40	40	30	52			
VACONX4C40500C	VACONX5C40500C	40	30	52	50	37	65	F3	286 x 513 x 314 11.19 x 20.19 x 11.73	22.68 50
VACONX4C40600C	VACONX5C40600C	50	37	65	60	45	77			
VACONX4C40750C	VACONX5C40750C	60	45	77	75	55	96			
VACONX4C41000C	VACONX5C41000C	75	55	96	100	75	124	F4	326 x 745 x 351 12.84 x 29.35 x 13.8	43.1 95
VACONX4C41250K	VACONX5C41250K	100	75	124	125	90	156			
VACONX4C41500K	VACONX5C41500K	125	90	156	150	110	180			
VACONX4C42000K	VACONX5C42000K	150	110	180	200	132	240	F5	461 x 1334 x 429 18.14 x 52.5 x 16.88	138.35 305

VACON X SERIES 575 VAC 3-PH

Product Code		Motor Shaft Power and Current						Frame Size	Dimensions W x H x D (mm) W x H x D (in)	Weight (kg) Weight (lbs)
Vacon X4	Vacon X5	High Overload (150%)			Low Overload (120%)					
		HP	kW	Amps	HP	kW	Amps			
---	VACONX5C50010C	0.5	0.37	0.9	1	0.75	1.7	F1A	221 x 306 x 216 8.72 x 12.01 x 8.49	6.35 14
---	VACONX5C50020C	1	0.75	1.7	2	1.5	2.7			
---	VACONX5C50030C	2	1.5	2.7	3	2.2	3.9			
---	VACONX5C50050C	3	2.2	3.9	5	4	6.1			
---	VACONX5C50075C	5	4	6.1	7.5	5.5	9			
---	VACONX5C50100C	7.5	5.5	9	10	7.5	11	F2A	273 x 442 x 251 10.75 x 17.38 x 9.89	13.38 29.5
---	VACONX5C50150C	10	7.5	11	15	11	17			
---	VACONX5C50200C	15	11	17	20	15	22			
---	VACONX5C50250C	20	15	22	25	18.5	27			
---	VACONX5C50300C	25	18.5	27	30	22	32			
VACONX4C50010C	VACONX5C50010C09	0.5	0.37	0.9	1	0.75	1.7	F1	221 x 306 x 166 8.72 x 12.01 x 6.51	6.35 14
VACONX4C50020C	VACONX5C50020C09	1	0.75	1.7	2	1.5	2.7			
VACONX4C50030C	VACONX5C50030C09	2	1.5	2.7	3	2.2	3.9			
VACONX4C50050C	VACONX5C50050C09	3	2.2	3.9	5	4	6.1			
VACONX4C50075C	VACONX5C50075C09	5	4	6.1	7.5	5.5	9			
VACONX4C50100C	VACONX5C50100C09	7.5	5.5	9	10	7.5	11	F2	273 x 442 x 201 10.75 x 17.38 x 7.91	13.38 29.5
VACONX4C50150C	VACONX5C50150C09	10	7.5	11	15	11	17			
VACONX4C50200C	VACONX5C50200C09	15	11	17	20	15	22			
VACONX4C50250C	VACONX5C50250C09	20	15	22	25	18.5	27			
VACONX4C50300C	VACONX5C50300C09	25	18.5	27	30	22	32			
VACONX4C50400C	VACONX5C50400C	30	22	32	40	30	41	F3	286 x 513 x 314 11.19 x 20.19 x 11.73	22.68 50
VACONX4C50500C	VACONX5C50500C	40	30	41	50	37	52			
VACONX4C50600C	VACONX5C50600C	50	37	52	60	45	62			
VACONX4C50750C	VACONX5C50750C	60	45	62	75	55	77	F4	326 x 745 x 351 12.84 x 29.35 x 13.8	43.1 95
VACONX4C51000C	VACONX5C51000C	75	55	77	100	75	99			
VACONX4C51250K	VACONX5C51250K	100	75	99	125	90	125			
VACONX4C51500K	VACONX5C51500K	125	90	125	150	110	144	F5	461 x 1334 x 429 18.14 x 52.5 x 16.88	138.35 305
VACONX4C52000K	VACONX5C52000K	150	110	144	200	132	192			

## VACON X SERIES OPTIONS

OPTION	ORDER TYPECODE	NOTE
DeviceNet Option Card	X5DNET01	VACON X5 Only. Models with "09" suffix will not accept option cards
Ethernet IP Option Card	X5EIP01	
ModBus TCP/IP Option Card	X5MBTCP01	
ProfiBus Option Card	X5PROF01	
115 Vac and Encoder Feedback Option Card	X5OPT01	
Remote Keypad for Panel Mount Drives	XRKPM	Includes 12' Ribbon Cable VACON X4 and X5 - Frames 0-2
Remote Keypad for Wall Mount Drives	XRKWM	VACON X4 and X5 - Frames 0-2
Remote Keypad Mounting Kit	XRKMK	VACON X4 and X5 - Frames 3-5
DB Connection Kit	XDBKITS4	VACON X4 and X5 - Frame 4 Only
DB Connection Kit - Frame 5	XDBKITS5	VACON X4 and X5 - Frame 4 Only

## VACON X4 AND VACON X5 SPECIFICATIONS

<b>Environmental</b>	Operating temperature	-10°C to +40°C (14°F to 104°F)			
	Storage temperature	-20°C to 65°C (-4°F to 149°F)			
	Humidity	0% to 95% non-condensing			
	Altitude	1,000 m (3,300 ft) without derating			
	Maximum vibration	Per EN50178: Frame Size 0 and 1 5G			
	Acoustic noise	80 dba sound power at 1 m (3 ft)			
	Cooling	1 - 5 HP models: Natural convection 7.5 - 200 HP: Forced air (temperature controlled external fan)			
	Protection Level	1 - 100 HP models: UL Type 4X / IP66 Indoor or Outdoor Use (1 - 30 HP models: 1,000 psi water spray at 6 inches) 125 - 200 HP models: UL Type 12 / IP55			
	Agency approvals	UL, cUL, CE			
<b>Electrical</b>	Input voltage	115 Vac 1 phase, +/- 15% 1 HP 200-230 Vac, 3 phase, +/- 15% 1-25 HP 380-460 Vac, 3 phase, +/- 15% 1-200 HP 575 Vac, 3 phase, +/- 15% 1-200 HP			
	Line frequency	50 / 60 Hz +/- 2 Hz			
	Source kVA (maximum)	10 times the unit rated kVA (65kA maximum)			
	DC bus voltage for:	115 Vac models	230 Vac models	460 Vac models	575 Vac models
	Overvoltage trip	406 Vdc	406 Vdc	814 Vdc	1017 Vdc
	Dynamic brake activation	388 Vdc	388 Vdc	776 Vdc	970 Vdc
	Normal undervoltage (UV) trip	199 Vdc	199 Vdc	397 Vdc	497 Vdc
	Control system	V/Hz or Sensorless Vector Control (SVC) Carrier frequency = 1 to 16 kHz programmable			
	Output voltage	0 to 100% of line voltage, 3 phase			
	Overload capacity	120% of rated RMS current for 60 seconds (Normal Duty rating) 150% of rated RMS current for 60 seconds (Heavy Duty rating)			
<b>Control Features</b>	Frequency output	Range: 0.1 - 400Hz; Stability: 0.1Hz, 0.1% analog over 24 hours +/- 10°C			
	DC holding/injection braking	At start, stop, by frequency with adjustable current level and time or continuous DC injection by digital input			
	Current limit	Four-quadrant adjustable from 5 to 150%			
	Speed ramps	Primary and alternate adjustable from 0.1 to 3200.0 seconds			
	Voltage boost	Adjustable fixed boost or adjustable auto boost			
	Voltage characteristic	V/Hz - Linear, pump, fan or 2-piece linear; Sensorless Vector			
	Timed overload	Adjustable inverse time trip (shear pin, 30 sec, 60 sec, 5 minutes) for standard or inverter-duty motors			
	Protective features	Overcurrent, Overvoltage fault, ground fault, short circuit, Dynamic Brake overload, drive temperature, power wiring fault. Drive-timed overload, input voltage quality, overvoltage ride-through			
	Program Sequence Controller	X4: 9-step, PLC-type functionality to control speed, direction and ramp times based on time, analog input, digital input or pulse count. X5: 25-step, PLC-type functionality that can control speed, direction and ramps based on time, analog input, digital input, or pulse input. Conditional branching, addressable outputs and real time operations possible.			
	PI and PID Feedback	X4: PI Process control available with the use of a customer supplied transducer, either 0-10Vdc, 4-20mA or optical encoder input to the drive. X5: Process control available with the use of a customer supplied transducer, either 0-10Vdc, 4-20mA or optical encoder input to the drive. Includes an optional sleep mode, activated when the loop is satisfied.			