



VACON X5
DESIGNED SMART. BUILT TOUGH.

VACON
DRIVEN BY DRIVES

THE TOUGHEST AC DRIVE ON THE PLANET

Vacon's X5 AC Drive is loaded with features that place it head and shoulders above other AC Variable Frequency Drives.

From general applications to advanced communications, the Vacon X5 provides real solutions for the world you work in with real time clock, advanced sequencing and USB functions.

Building on the brawn and success of Vacon's X4 AC Drive with advanced smart features, Vacon's X5 raises the bar for general and special application drives.

Designed to deliver system applications with advanced features, Vacon's X5 is ideally configured for jobs where data collection, custom interfacing and sequencing parameters are a priority.

In the Vacon X4 tradition, the Vacon X5's tough enclosure shields the advanced capabilities from hostile environments. Add in the real time clock functionality, advance-process control features, and USB versatility you can see why the Vacon X5 raises the standard for advanced AC Drive applications.

If you care about quality, full features and need fewer things to worry about, invest in a real solution — Vacon's X5 AC Drive.





TOUGH AND EASY TO USE

- Includes all the features of our X4 AC Drive
- Enhanced keypad design utilizes color-coded buttons and easier-to-read display
- NEMA 4X/IP66 enclosures through 100 HP, NEMA 12/IP55 for 125 HP and above
- All PC boards are conformal coated for additional protection

SMART DESIGN

- Real Time Clock — Time-of-Day functionality
- Data capture, event logs, reminder warnings
- Advanced Program Sequencer function (built-in PLC)
- Standard USB port — memory stick plug-in for data storage and drive reflashing
- System-level drive features for precise control and flexibility
- Wireless programming using PDA-trAC+® from your Pocket PC

ADVANCED PROCESS CONTROL OPTIONS

- 115 Vac control interface
- Encoder feedback
- Communication protocols
 - ModBus
 - Ethernet IP
 - ModBus TCP/IP
 - DeviceNet
 - Profibus



SIMPLE TO OPERATE

Basic operations are a breeze with Vacon's enhanced keypad. The familiar design uses color-coded buttons with text and symbols, remains easy-to-use and understand, yet offers an unprecedented breadth of functionality. With a few simple touch commands, operators have access to parameters for configuration, start-up, operation and troubleshooting.

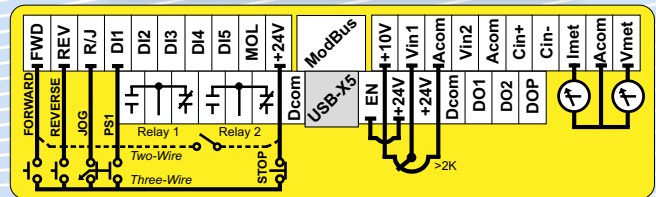
- Run set-up macros for fan, pump, or sensorless vector applications with real time clock capabilities. Collect real time data and event logs using a choice of communication protocols or through the standard USB port.
- Expand the basic operations with predefined macro commands that simplify common application set ups. One-touch menu selection collects the most frequently used parameters and presets them with common application settings. Collect real time data and event logs using a choice of communication protocols or through standard USB port.



Vacon's user-friendly keypad makes operation simple.



The easy-to-read display communicates status information.



- The user-connection terminal strip handles common jobs with ease while providing application flexibility with extra inputs and relays not found on other drives.
- Standard "Built-In" Dynamic Braking Resistors virtually eliminate nuisance trips, providing more uptime.
- 60:1 constant torque turn down ratio provides low speed performance when you need it. Optional performance with enhanced turndown ratio using encoder feedback option.



PDA-trAC+® software allows Pocket PC devices with infrared networking capabilities to be used for accurate product configuration. No more need for special cables, adapters or opening enclosures to change a setting! Download your free copy from our web site: www.vacon.com

Quality you can trust.
We are so sure of the built-in quality, that we have a standard 3-year warranty.

USER-FRIENDLY FEATURES

USB FUNCTIONS

- 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

REAL TIME CLOCK FUNCTION

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

PROGRAM SEQUENCER ENHANCEMENTS

- Improved functionality is closer to traditional PLC than available with current X4
- 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

OPTIONS

The ability to accept option boards enhances the Vacon X5's application flexibility.

Current options afford Vacon X5 with the opportunity to communicate on powerful serial communication networks like DeviceNet, Ethernet IP and Modbus TCP/IP. An additional option affords the opportunity to interface a shaft mounted optical encoder to the Vacon X5 for improved performance. All options include five (5) channels of 115Vac control options.

APPLICATIONS



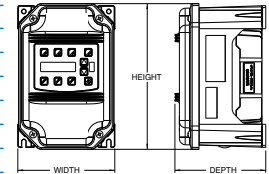
Municipal Water Supply Application — User needs to gather information on a scheduled basis of the amount of water that is pumped out of a municipal well. The readings must be gathered weekly and be in thousands of gallons per day. The Keeper function can gather this automatically and the operator only needs to download once a week. The information is in CSV format that will open in Excel with defined headers.



Unattended Operation — Energy savings add up every day with Vacon X5's time-of-day functionality providing automated startup of critical operating systems. Prior to the arrival of the production team, each morning the dust collector, cooling fans and even the lights in a foundry all start-up to full operating status without the need for human intervention. At the end of the day, no one needs to remember to shut these systems down. The Vacon X5 takes care watching the clock for you. Saving energy is just one of the benefits delivered by the Vacon X5.

VACON X5 GENERAL INFORMATION

	Frame 0		Frame 1/1A		Frame 2/2A		Frame 3		Frame 4		Frame 5	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
Height	9.47	241	12.01	306	17.38	442	20.19	513	29.35	745	51.02	1296
Width	6.5	165	8.72	221	10.75	273	11.19	286	12.84	326	16.31	414
Depth (Full Feature)	-	-	8.49	216	9.89	251	11.73	314	13.8	351	16.88	429
Depth (No Options)	6.08	155	6.51	166	7.91	201	-	-	-	-	-	-
Weight: lbs (kg)	8.5 (3.85)		14 (6.35)		29.5 (13.38)		50 (22.68)		95 (43.10)		305 (138.35)	



Full Feature Model Numbers	No Options Model Numbers	Horsepower		kW	Max. Input Current (Amps)	Max. Output Current (Amps) 3-Phase Output ONLY	Standard DB Resistance	Minimum External DB Resistance	Frame	
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115 VOLTS AC, +/- 10%, SINGLE-PHASE INPUT

		Normal Duty	Heavy Duty			115 Vac		230 Vac	Ohms	Ohms	Full	No Option
X5C1S010C	X5C1S010C09	-	0.5	0.75	-	15	-	4.2	125	-	1A	0

200-230 VOLTS AC, +/- 15%, THREE-PHASE INPUT

		Normal Duty	Heavy Duty	kW	200 Vac	230 Vac	200 Vac	230 Vac	Ohms	Ohms	Full	No Option
X5C20010C	X5C20010C09	1	0.5	0.5	5.6	4.8	4.8	4.2	125	-	1A	0
X5C20020C	X5C20020C09	2	1.5	1.5	9	7.8	7.8	6.8	125	-	1A	0
X5C20030C	X5C20030C09	3	2	2.2	12.7	11	11	9.6	125	-	1A	0
X5C20050C	X5C20050C09	5	3	4	20.2	17.5	17.5	15.2	60	43	1A	1
X5C20075C	X5C20075C09	7.5	5	5.5	29.2	25.3	25.3	22	60	30	1A	1
X5C20100C	X5C20100C09	10	7.5	7.5	37.2	32.2	32.2	28	60	27	2A	2
X5C20150C	X5C20150C09	15	10	11	52.1	46.4	48.3	42.0	60	20	2A	2
X5C20200C		20	15	15.5	68.3	57.4	62.1	54.0	30	10	3	-
X5C20250C		25	20	18.5	82.3	73.8	78.2	68.0	30	10	3	-
X5C20300C		30	25	22	96.0	84.0	92.0	80.0	30	10	3	-

380-460 VOLTS AC, +/- 15%, THREE-PHASE INPUT

		Normal Duty	Heavy Duty	kW	380 Vac	460 Vac	380 Vac	460 Vac	Ohms	Ohms	Full	No Option
X5C40010C	X5C40010C09	1	0.5	0.75	3	2.4	2.4	2.1	500	-	1A	0
X5C40020C	X5C40020C09	2	1	1.5	5.2	3.9	3.8	3.4	500	-	1A	0
X5C40030C	X5C40030C09	3	2	2.2	7.2	5.6	5.1	4.8	500	-	1A	0
X5C40050C	X5C40050C09	5	3	4	12	8.8	8.9	7.6	120	100	1A	1
X5C40075C	X5C40075C09	7.5	5	5.5	15	12.8	12	11	120	75	1A	1
X5C40100C	X5C40100C09	10	7.5	7.5	19.7	16.3	15.6	14	120	75	1A	1
X5C40150C	X5C40150C09	15	10	11	30.9	25.8	23.0	21.0	120	47	2A	2
X5C40200C	X5C40200C09	20	15	15	40.0	33.3	31.0	27.0	120	47	2A	2
X5C40250C	X5C40250C09	25	20	18	46.3	40.0	37.0	34.0	120	47	2A	2
X5C40300C	X5C40300C09	30	25	22	57.5	47.8	43.0	40.0	120	39	2A	2
X5C40400C		40	30	30	73.2	62.4	61.0	52.0	60	20	3	-
X5C40500C		50	40	37	82.0	78.0	71.0	65.0	60	20	3	-
X5C40600C		60	50	45	94	80	86	77	60	15	4	-
X5C40750C		75	60	55	114	99	105	96	60	10	4	-
X5C41000C		100	75	75	149	129	140	124	60	10	4	-
X5C41250D		125	100	90	168	156	168	156	60	10	5	-
X5C41500D		150	125	110	205	180	205	180	60	10	5	-
X5C42000D		200	150	132	240	240	240	240	60	10	5	-

575 VOLTS AC, +/- 15%, THREE-PHASE INPUT

		Normal Duty	Heavy Duty	kW		575 Vac		575 Vac	Ohms	Ohms	Full	No Option
X5C50010C	X5C50010C09	1	0.5	0.75	-	2	-	1.7	120	110	1A	1
X5C50020C	X5C50020C09	2	1	1.5	-	3.6	-	2.7	120	110	1A	1
X5C50030C	X5C50030C09	3	2	2.2	-	5	-	3.9	120	110	1A	1
X5C50050C	X5C50050C09	5	3	4	-	7.6	-	6.1	120	110	1A	1
X5C50075C	X5C50075C09	7.5	5	5.5	-	10.4	-	9	120	91	1A	1
X5C50100C	X5C50100C09	10	7.5	7.5	-	14.1	-	11	120	91	1A	1
X5C50150C	X5C50150C09	15	10	11	-	23.0	-	17.0	120	62	2A	2
X5C50200C	X5C50200C09	20	15	15	-	31.0	-	22.0	120	62	2A	2
X5C50250C	X5C50250C09	25	20	18	-	39.0	-	27.0	120	62	2A	2
X5C50300C	X5C50300C09	30	25	22	-	39.5	-	32.0	120	62	2A	2
X5C50400C		40	30	30	-	49.0	-	41.0	60	24	3	-
X5C50500C		50	40	37	-	58.0	-	52.0	60	24	3	-
X5C50600C		60	50	45	-	68	-	62	60	15	4	-
X5C50750C		75	60	55	-	82	-	77	60	15	4	-
X5C51000C		100	75	75	-	107	-	99	60	20	4	-
X5C51250D		125	100	90	-	125	-	125	60	10	5	-
X5C51500D		150	125	110	-	144	-	144	60	10	5	-
X5C52000D		200	150	132	-	192	-	192	60	10	5	-

VACON X5 SPECIFICATIONS

Environmental

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
Acoustic noise	80 dba sound power at 1 m (3 ft)
Cooling	Up to 5 HP models: Natural convection 7.5 to 200 HP: Forced air (temperature controlled external fan)

Electrical

Input voltage	X5C1Sx models: 115 Vac 1 phase, +/- 10% X5C2x models: 200-230 Vac, 3 phase, +/- 15% X5C4x models: 380-460 Vac, 3 phase, +/- 15% X5C5x models: 575 Vac, 3 phase, +/- 15%		1 HP 1-30 HP 1-200 HP 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)			
Frequency range	0.1 to 400 Hz			
Frequency stability	0.1 Hz (digital), 0.1% (analog) over 24 hours +/- 10°C			
Frequency setting	By keypad, or by external signal (0 to 5 Vdc, 0 to 10 Vdc, 0/4 to 20 mA), or by pulse train up to 100 kHz			

Control Features

Vin1 reference input	0-5/10 Vdc, 0/4-20 mAdc (250 ohm), pulse train input, 0-1/10/100 kHz pulse input, Inverted function, 0-5-10 bipolar input, broken wire detection. Span and offset adjustment.
Vin2 reference input	0-5/10 Vdc, 0-5-10 bipolar input, inverted function, broken wire detection. Span and offset adjustment. Programmable for frequency reference or current limit input.
Cin reference input	0/4-20 mAdc (50 ohm), inverted function, span and offset adjustment. Programmable for frequency reference or current limit input.
Reference voltage	10 Vdc (10 mAdc maximum)
Digital inputs – 10	Off = 0 to 3 Vdc, On = 10 to 32 Vdc (pull-up logic), selectable between pull-up and pull-down logic
Digital supply voltage	24 Vdc (150 mAdc maximum)
Preset frequencies	16 preset frequencies
Digital outputs	2 SPDT relay output — 130 Vac, 1 Amp/250 Vac, 0.5 Amp 2 open collector outputs 50 mA per device
Vmet analog output	0 to 10 Vdc (5 mAdc maximum)
Imet analog output	0/4-20 mAdc output into a 500 ohm load
DC holding/injection braking	At start, stop, by frequency with adjustable current level and time or continuous DC injection by digital input
Current limits	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)	V/Hz - Linear, pump, fan or 2-piece linear, also 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 ridethrough
Program Sequence Controller	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.
PID Feedback	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.



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