VACON 100 HVAC
PREMIUM AC DRIVE
FOR INDOOR CLIMATE CONTROL

VACON
DRIVEN BY DRIVES

VACON IN BRIEF

Vacon is a leading supplier of variable-speed AC drives. Vacon is driven by a passion to develop, manufacture and sell only the best AC drives in the world — and nothing else. AC drives are used to control electric motors as well as for renewable energy generation. Vacon has R&D and production units in Finland, USA, China and Italy, and sales offices in 27 countries. Vacon AC drives are being sold by partners in approximately 100 countries.

VACON — TRULY GLOBAL

- **MANUFACTURING AND R&D**
  on 3 continents
- **VACON SALES AND SERVICES**
  in 27 countries
- **SERVICE CENTERS**
  in 50 countries (including partners)

MR4 MR5 MR6

IT'S EFFICIENCY THAT COUNTS

The Vacon 100 HVAC is designed to meet and exceed even the stringent requirements of the building automation industry. Easy installation, efficient and trouble-free operation, and fast return on investment are guaranteed. No HVAC task is too complex for the Vacon 100 HVAC. Installing and commissioning the Vacon 100 HVAC can be done by just about anyone. The Vacon 100 HVAC is available in the power range of 0.55 to 160 kW (0.75 to 200 HP), and supply voltages of 230 to 480 V.

EFFICIENT INVESTMENT

With the Vacon 100 HVAC, a short payback time is guaranteed as continuous energy savings are achieved throughout the product's lifetime. Further, a standard delivery of the Vacon 100 HVAC includes all the necessary hardware, I/O and communication features, usually with no need to buy any additional options. The Vacon 100 HVAC complies with all the relevant approvals and standards, including those for EMC and safety.

EASY INSTALLATION

The Vacon 100 HVAC, with its smallest IP54/Type 12 footprint and built-in accessories, makes installation extremely easy and fast. The high-resolution graphical keypad with intuitive wizards and online help add to the user-friendliness during installation and operation. Installation is space saving and easy as Vacon 100 HVAC/IP54 units can be mounted side by side.

SMOOTH OPERATION

Interference-free operation is ensured with built-in RFI filters and harmonics filters. The Vacon 100 HVAC operates silently in a building area with the use of high switching frequency and the optimum use of a cooling fan. With the help of a real-time clock and calendar-based functions, the HVAC process can be optimized to achieve considerable energy savings.

LONG LIFETIME

All the components of the Vacon 100 HVAC have a typical lifetime of 10 years or more, and they are environmentally friendly for easy recycling. There is no need to change any parts during periodic maintenance. Should you require help with your drive, Vacon guarantees that support and service are always available, both locally and globally.

MR7

MR8

MR9

FEATURES AND BENEFITS

BUILT IN

The Vacon 100 HVAC is ready to communicate with an external controller via Ethernet and RS485 protocols used in HVAC. BACnet IP and Modbus TCP via Ethernet and Modbus RTU, Metasys N2 and BACnet MSTP via RS485 are available as standard.

Saves on investment costs. Simple to order.

The Vacon 100 HVAC has integrated harmonics filters in the DC link.

Complies with the harmonics standard IEC 61000-3-12. Saves on costs. No need for additional harmonics filter.

All circuit boards are varnished and comply with IEC 60721-3-3 (chemically active substances, class 3C3 and mechanically active substances, class 3S2). They are tested in accordance with IEC 60068-2-60, Method 1 (H_2S hydrogen sulfide and SO_2 sulfur dioxide).

High immunity against demanding environments.

The IP21/Type 1 and IP54/Type 12 units have the same footprint, and the IP54 units can be mounted side by side.

Easy integration of IP21 units to cabinets, smallest IP54 saves space and investment costs.

Thanks to the flange mounting option, the Vacon 100 HVAC can be mounted in the plenum, which allows easy integration with other HVAC equipment.

Saves on investment costs. Easy integration.

INTEGRATED DRIVE SUPPLY SWITCH

Using the integrated drive supply switch option, the drive's main supply can be disconnected and locked during maintenance work. This option is UL, CE and $_c$UL certified.

Saves on investment costs and space. Provides safety during maintenance.

DEDICATED TO HVAC

2 x PID controller for accurate HVAC process control.

Reduces the need for an external controller. Improves the performance of the HVAC system. Reduces investment costs as one PID controller is available for external use.

Fire mode is enabled in case of a fire hazard in a building. The Vacon 100 HVAC overrides faults and continues to operate in spite of harsh conditions.

Safety in case of fire hazard, smooth evacuation in case of fire.

The motor switch ride-through feature ensures tripless operation when the motor is disconnected and reconnected to the drive while running.

Fast and tripless maintenance of the motor or HVAC equipment.

Using the multipump feature, a single Vacon 100 HVAC drive can control the HVAC process with 4 pumps.

Reduces investment costs. Increases the lifetime of pumps.

EASY TO USE KEYPAD

9 values can be monitored at the same time on a single page with the graphical keypad.

Monitors process and drive at the same time. Easy to use.

Help in plain text is provided for parameters, faults and alarms.

Saves time during installation and maintenance. Often no need for manuals.

Start-up wizard and mini-wizard guide the user with simple question and answer sessions through the installation of the drive and commissioning of advanced features such as PID and multipump.

Saves time, no need for special skills. Easy to use.

SAVE ENERGY

All Vacon 100 HVAC drives have an efficiency level of more than 97,5%.

Energy saving.

The use of a cooling fan in the Vacon 100 HVAC is optimized and controlled according to the need. The cooling fan is also easy to replace.

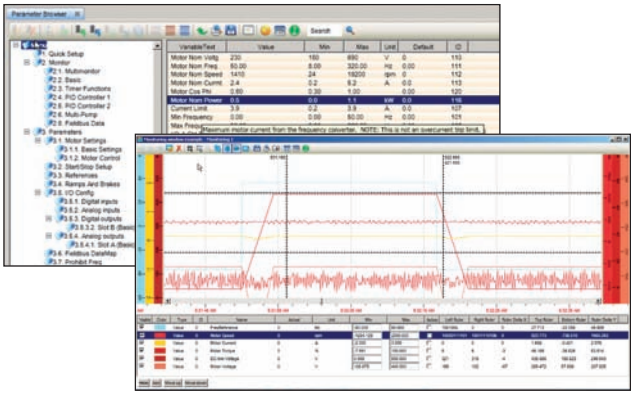
Energy saving, longer lifetime and silent operation.

When the sleep mode is used, the drive automatically stops when there is no demand from the process. It also wakes up on demand.

Energy saving.

A real-time clock allows the HVAC process to run with 5 calendar-based schedules and 3 timer inputs.

Energy saving.



SUPPORT FROM SOFTWARE TOOLS

The Vacon Live software tool communicates directly via Ethernet, and helps in installation, commissioning and maintenance. A USB-to-RS485 interface is also available. This software is free of charge.

Saves on operating and maintenance costs. Easy to configure and use.

The drive as well as process-related values can be graphically monitored on a real-time axis. Parameters can be edited, saved for backup, and compared with defaults or a back-up file.

Easy commissioning and maintenance.

A service info file can be sent quickly to maintenance staff or a service provider. It contains back-up of all parameters, faults and alarms, including a history buffer, as well as drive hardware and software details.

Reduces downtime. Saves on operating and maintenance costs.

TECHNICAL DATA

Mains voltage 208—240 V, 50/60 Hz, 3~							
AC drive type	Loadability Low (+40°C)		Motor shaft power 230 V supply (kW)	Power (HP)	Frame size	Dimensions WxHxD (mm) **WxHxD (inch)**	Weight (kg) **Weight (lbs)**
	Rated continuous current I_L (A)	10% overload current (A) 1 min/10 min					
VACON0100-3L-0003-2-HVAC VACON0100-3L-0004-2-HVAC VACON0100-3L-0007-2-HVAC VACON0100-3L-0008-2-HVAC VACON0100-3L-0011-2-HVAC VACON0100-3L-0012-2-HVAC	3.7 4.8 6.6 8.0 11.0 12.5	4.1 5.3 7.3 8.8 12.1 13.8	0.55 0.75 1.1 1.5 2.2 3.0	0.75 1.0 1.5 2.0 3.0 *	MR4	128x328x190 **5x12.9x7.5**	6.0 **13.0**
VACON0100-3L-0018-2-HVAC VACON0100-3L-0024-2-HVAC VACON0100-3L-0031-2-HVAC	18.0 24.0 31.0	19.8 26.4 34.1	4.0 5.5 7.5	5.0 7.5 10.0	MR5	144x419x214 **5.7x16.5x8.4**	10.0 **22.0**
VACON0100-3L-0048-2-HVAC VACON0100-3L-0062-2-HVAC	48.0 62.0	52.8 68.2	11.0 15.0	15.0 20.0	MR6	195x557x229 **7.7x21.9x9**	20.0 **44.0**
VACON0100-3L-0075-2-HVAC VACON0100-3L-0088-2-HVAC VACON0100-3L-0105-2-HVAC	75.0 88.0 105.0	82.5 96.8 115.5	18.5 22.0 30.0	25.0 30.0 40.0	MR7	237x660x259 **9.3x26x10.2**	37.5 **83.0**
VACON0100-3L-0140-2-HVAC VACON0100-3L-0170-2-HVAC VACON0100-3L-0205-2-HVAC	140.0 170.0 205.0	154.0 187.0 225.5	37.0 45.0 55.0	50.0 60.0 75.0	MR8	290x966x343 **11.4x38x13.5**	66.0 **145.5**
VACON0100-3L-0261-2-HVAC VACON0100-3L-0310-2-HVAC	261.0 310.0	287.1 341.0	75.0 90.0	100.0 125.0	MR9	480x1150x365 **18.9x45.3x14.4**	108.0 **238.0**
Mains voltage 380—480 V, 50/60 Hz, 3~			**400 V supply (kW)**				
VACON0100-3L-0003-4-HVAC VACON0100-3L-0004-4-HVAC VACON0100-3L-0005-4-HVAC VACON0100-3L-0008-4-HVAC VACON0100-3L-0009-4-HVAC VACON0100-3L-0012-4-HVAC	3.4 4.8 5.6 8.0 9.6 12.0	3.7 5.3 6.2 8.8 10.6 13.2	1.1 1.5 2.2 3.0 4.0 5.5	1.5 2.0 3.0 * 5.0 7.5	MR4	128x328x190 **5x12.9x7.5**	6.0 **13.0**
VACON0100-3L-0016-4-HVAC VACON0100-3L-0023-4-HVAC VACON0100-3L-0031-4-HVAC	16.0 23.0 31.0	17.6 25.3 34.1	7.5 11.0 15.0	10.0 15.0 20.0	MR5	144x419x214 **5.7x16.5x8.4**	10.0 **22.0**
VACON0100-3L-0038-4-HVAC VACON0100-3L-0046-4-HVAC VACON0100-3L-0061-4-HVAC	38.0 46.0 61.0	41.8 50.6 67.1	18.5 22.0 30.0	25.0 30.0 40.0	MR6	195x557x229 **7.7x21.9x9**	20.0 **44.0**
VACON0100-3L-0072-4-HVAC VACON0100-3L-0087-4-HVAC VACON0100-3L-0105-4-HVAC	72.0 87.0 105.0	79.2 95.7 115.5	37.0 45.0 55.0	50.0 60.0 75.0	MR7	237x660x259 **9.3x26x10.2**	37.5 **83.0**
VACON0100-3L-0140-4-HVAC VACON0100-3L-0170-4-HVAC VACON0100-3L-0205-4-HVAC	140.0 170.0 205.0	154.0 187.0 225.5	75.0 90.0 110.0	100.0 125.0 150.0	MR8	290x966x343 **11.4x38x13.5**	66.0 **145.5**
VACON0100-3L-0261-4-HVAC VACON0100-3L-0310-4-HVAC	261.0 310.0	287.1 341.0	132.0 160.0	200.0 250.0	MR9	480x1150x365 **18.9x45.3x14.4**	108.0 **238.0**

* Please check full load Amperes on the nameplate of the motor.

TYPE DESIGNATION CODE

VACON0100-3L-0061-4-HVAC +OPTION CODES

+SBF2 = 2 x RO + Thermistor (Replaces 3 relay standard board)
+IP54 = IP54/Type 12
+SRBT = Real-time clock battery
+S_B1 = 6 x DI/DO, (slot D or E)
+S_B2 = 2 x RO + Thermistor, (slot D or E)
+S_B4 = 1 x AI, 2 x AO, (slot D or E)
+S_B5 = 3 x RO, (slot D or E)
+S_B9 = 1 x RO, 5 x DI (42-240 VAC), (slot D or E)
+S_BF = 1 x AO, 1 x DO, 1 x RO, (slot D or E)
+S_C4 = LonWorks, (slot D or E)
+QFLG = Flange mounting (MR4-MR7)
+QGLC = Conduit plate with inch holes
+EMC4 = Change to EMC-level C4 for IT networks
Language packages:
+FL01 = English, German, Italian, French, Finnish, Swedish
+FL02 = English, German, Finnish, Danish, Swedish, Norwegian
+FL03 = English, Spanish, French, Italian, Dutch, Portuguese
+FL04 = English, German, Czech, Polish, Russian, Slovakian
+FL05 = English, German, Romanian, Turkish

Supply voltage: 2 = 208-240 V, 4 = 380-480 V
Drive rating in Ampere: e.g. 0061 = 61 A
Input/Function: 3L = Three-phase input

Standard delivery includes IP21/ Type 1, EMC level C2, graphical display keypad, relay board 1 +SBF1 (3 x RO) and +FL01.

Mains connection	Input voltage Uin	208...240 V; 380...480 V; -10%...+10%
	Input frequency	50...60 Hz, -5%...+10%
	Connection to mains	Once per minute or less
	Starting delay	4 s (MR4 to MR6); 6 s (MR7 to MR9)
Motor connection	Output voltage	0-Uin
	Continuous output current	IL: Ambient temperature up to 40°C (104°F) overload 1.1 x IL (1 min./10 min.)
	Output frequency	0...320 Hz (standard)
	Frequency resolution	0.01 Hz
Control characteristics	Switching frequency	1.5...10 kHz; Automatic switching frequency derating in case of overheating
	Frequency reference Analog input	Resolution 0.01 Hz Resolution 0.1% (10-bit)
	Field weakening point	8...320 Hz
	Acceleration time	0.1...3000 sec
	Deceleration time	0.1...3000 sec
Ambient conditions	Ambient operating temperature	IL : -10°C (-14°F) (no frost)...+55°C (131°F)
	Storage temperature	-40°C (-40°F)...+70°C (158°F)
	Relative humidity	0 to 95% RH, non-condensing, non-corrosive
	Air quality: IEC 60068-2-60 • chemical vapors • mechanical particles	 IEC 60721-3-3, unit in operation, class 3C3 IEC 60721-3-3, unit in operation, class 3S2
	Altitude	100% load capacity (no derating) up to 1.000 m (3280 ft) 1% derating for each 100 m (328 ft) above 1.000 m (3280 ft) Max. altitudes: 4.500 m (14763 ft) (TN and IT systems)
	Vibration	IEC 61800-5-1 IEC 60068-2-6
	Shock	IEC 61800-5-1 IEC 60068-2-27
	Enclosure class	IP21/Type 1 standard in entire range IP54/Type 12 option
EMC (at default settings)	Immunity	Fulfils IEC 61800-3, first and second environment
	Emissions	Depend on EMC level. +EMC2: IEC 61800-3, Category C2 Vacon 100 HVAC will be delivered with class C2 EMC filtering, if not otherwise specified. Vacon 100 HVAC can be modified for IT networks
Emissions	Average sound pressure level in dB(A) (1 m from the drive)	MR4: 56, MR5: 61, MR6: 68, MR7: 68, MR8: 77, MR9: 78
Safety and Approvals		EN 61800-5-1, EN 61800-3, EN 61000-3-12, UL 508 C, CE, UL, cUL, GOST-R; (see unit nameplate for more detailed approvals)

Basic I/O board		
Terminal		**Signal**
1	+10 V_{ref}	Reference output
2	AI1+	Analog input, voltage or current
3	AI1-	Analog input common (current)
4	AI2+	Analog input, voltage or current
5	AI2-	Analog input common (current)
6	24 V_{out}	24 V aux. voltage
7	GND	I/O ground
8	DI1	Digital input 1
9	DI2	Digital input 2
10	DI3	Digital input 3
11	CM	Common A for DI1-DI6
12	24 V_{out}	24 V aux. voltage
13	GND	I/O ground
14	DI4	Digital input 4
15	DI5	Digital input 5
16	DI6	Digital input 6
17	CM	Common A for DI1-DI6
18	AO1+	Analog signal (+output)
19	AO-/GND	Analog output common
30	+24 V_{in}	24 V auxiliary input voltage
A	RS485	Differential receiver/transmitter
B	RS485	Differential receiver/transmitter

Standard relay board (3 x RO) can be replaced by SBF2 (2 x RO + Thermistor).

Standard relay board			**Optional relay board**		
Terminal		**+SBF1**	**Terminal**		**+SBF2**
21	RO1/1 NC	Relay output 1	**21**	RO1/1 NC	Relay output 1
22	RO1/2 CM		**22**	RO1/2 CM	
23	RO1/3 NO		**23**	RO1/3 NO	
24	RO2/1 NC	Relay output 2	**24**	RO2/1 NC	Relay output 2
25	RO2/2 CM		**25**	RO2/2 CM	
26	RO2/3 NO		**26**	RO2/3 NO	
32	RO3/1 CM	Relay output 3	**28**	TI1+	Thermistor input
33	RO3/2 NO		**29**	TI1-	

Option boards (all boards are varnished)	
OPT-F1-V	3 x Relay output
OPT-F2-V	2 x Relay output + Thermistor
OPT-B1-V	6 x DI/DO, each I/O can be individually programmable as input or output
OPT-B2-V	2 x Relay output + Thermistor
OPT-B4-V	1 x AI, 2 x AO (isolated)
OPT-B5-V	3 x Relay output
OPT-B9-V	1 x RO, 5 x DI (42-240 VAC)
OPT-C4-V	LonWorks
OPT-BF-V	1 x AO, 1 x DO, 1 x RO

VACON

DRIVEN BY DRIVES

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Vacon Partner

BC00393G