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 V, 400 V and 480 V.

EFFICIENT INVESTMENT

With the Vacon 100 HVAC, a short payback time is guaranteed as continuous energy saving is achieved throughout the product's lifetime. Further, the standard delivery of Vacon 100 HVAC includes all the necessary hardware, I/O and communication features with usually no need to buy any additional options. 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 naturally also adds to the user-friendliness during installation and operation. Cabinet integration is space saving and easy as Vacon 100 HVAC can be mounted side by side with no space between the units.

SMOOTH OPERATION

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

LONG LIFETIME

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

MR7   **MR8**   **MR9**

FEATURES AND BENEFITS

BUILT IN

Vacon 100 HVAC is ready delivered to the communication with BMS controller with 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.

Vacon 100 HVAC is integrated with harmonics filters at DC link.

> Complies with the harmonics standard IEC 61800-3-12. Saves on costs. No need for additional harmonics filter.

All circuit boards are varnished and designed for IEC 60721-3-3. Chemically active substances, class 3C3 and mechanically active substances, class 3S2. Tested according to IEC 60068-2-60 Method 1 (H_2S hydrogen sulfide and SO_2 sulfur dioxide).

> High immunity against demanding environments.

IP21/Type 1 and IP54/Type 12 units have the same footprint and IP54 units can be mounted side by side with no space in between them.

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

With the flange mounting option, the Vacon 100 HVAC can be mounted in the plenum, and thus makes easy integration with HVAC equipment.

> Saves on investment costs. Easy integration.

INTEGRATED DRIVE SUPPLY SWITCH

With integrated drive supply switch option, the main supply to the drive 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 external controller. Increases performance of 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.

Motor switch ride through feature ensures tripless operation when the motor is disconnected and connected to the drive while running.

Fast and tripless maintenance on the motor or HVAC equipment.

With multipump, only one Vacon 100 HVAC drive can control the HVAC process with 4 pumps.

Reduces investment costs. Increases lifetime of pumps.

EASY TO USE KEYPAD

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

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

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

Saves time during installation and maintenance. Most often no need for manuals.

Startup wizard and mini-wizard guide the user with simple questions and answer sessions for installation of the drive and commissioning of advanced features like PID and multipump.

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

SAVE ENERGY

All the Vacon 100 HVAC drives have efficiency more than 97%.

Energy saving.

Use of cooling fan in the Vacon 100 HVAC is optimised and controlled according to the need. The cooling fan is also easy to replace.
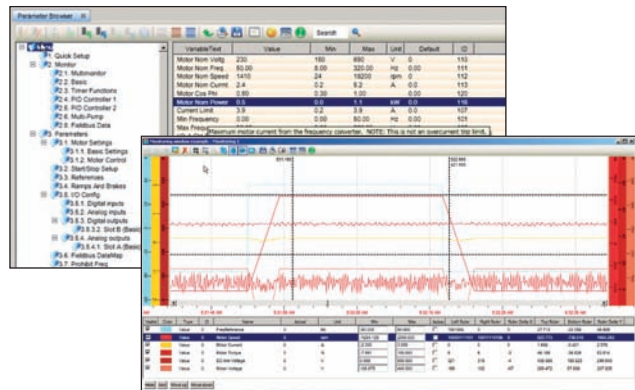
Energy saving, longer lifetime and silent drive operation.

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

Energy saving.

Real time clock allows HVAC process to run with 5 calender based schedules and three timer inputs.

Energy saving.

SUPPORT FROM SOFTWARE TOOLS

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

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

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

Easy commissioning and maintenance.

Service info file with an email button can be sent quickly to a maintenance staff or service provider. It contains back up of all parameters, faults and alarms including history buffer, drive hardware and software details.

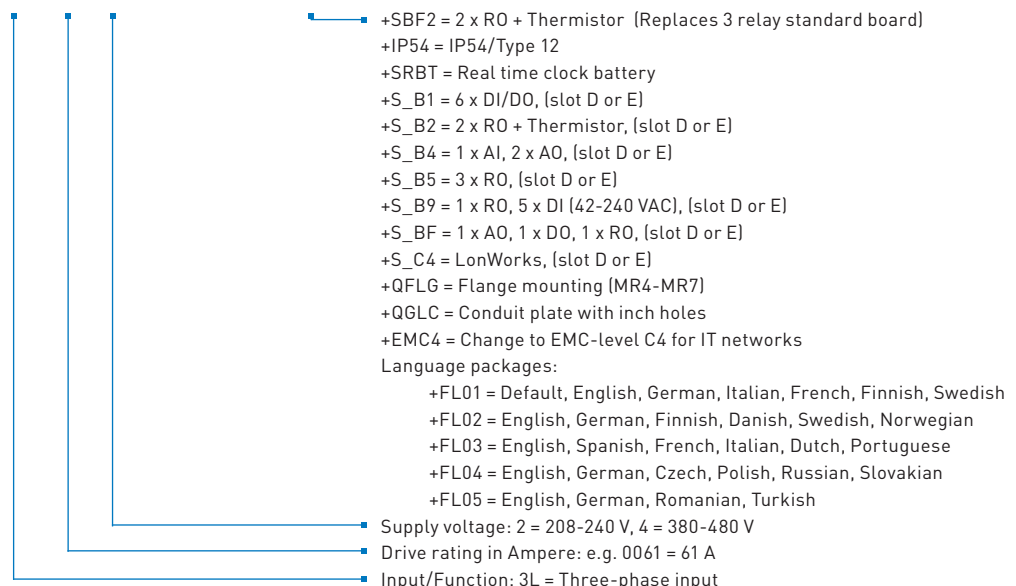Reduces downtime. Saves on operating and maintenance costs.

TECHNICAL DATA

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

* 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 = Default, 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 and relay board 1 +SBF1 (3 x RO).

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 55°C (131 F°) with derating, 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 Analogue 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 vapours • 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 will be delivered with class C2 EMC filtering, if not otherwise specified. Vacon 100 can be modified for IT-networks.
Emissions	Average noise level (cooling fan) soundpower level in dB(A)	MR4: 65, MR5: 70, MR6: 77, MR7: 77, MR8: 86, MR9: 87
Safety and Approvals		EN 61800-5-1, EN 61800-3, EN 61000-3-12, UL 508 C, CE, UL, cUL, GOST-R; (see unitnameplate 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			Optional relay board	
Terminal		+SBF1	Terminal	+SBF2
21	RO1/1 NC		21	RO1/1 NC	
22	RO1/2 CM	Relay output 1	22	RO1/2 CM	Relay output 1
23	RO1/3 NO		23	RO1/3 NO	
24	RO2/1 NC		24	RO2/1 NC	
25	RO2/2 CM	Relay output 2	25	RO2/2 CM	Relay output 2
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

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

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Subject to changes without notice.