VCM Series
Sensorless Vector AC Drive
0.5 - 75 HP
200 - 480 Volts

The ideal AC drive... Full featured, yet easy to use!

- Sensorless Vector or V/Hz control
- Simplicity by design
- 150% starting torque
- Full protection
- Flexible I/O
- PID function
- RS485 communications

by MOTORTRONICS

Simplicity by Design

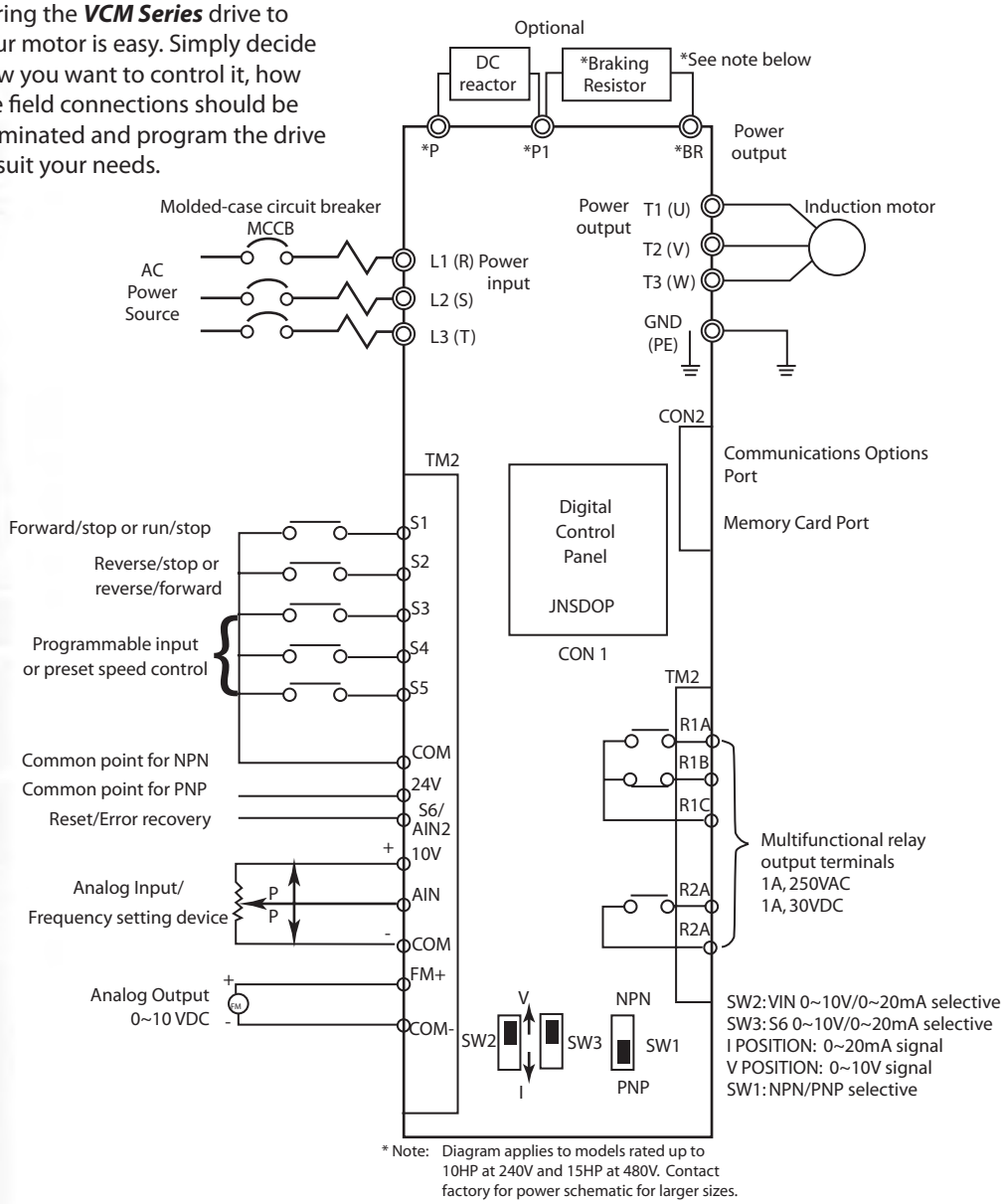
VCM Series is a compact, cost-effective drive with features typically found only in more complex and expensive AC drives. This full featured sensorless vector drive is recognized for being simple to set up, program and operate. Available in ratings from 0.5 to 75HP, the ***VCM Series*** is ideally for nearly any application.

The convenient operator panel provides simple, yet informative interface during setup and operation. The tactile feedback keypad is used for programming the drive and motor speed can be controlled using either the keypad or the handy, built-in potentiometer. The alphanumeric display indicates operation, status and fault read-out and is easily visibile in low ambient light conditions. In addition, LED indicators provide direction of rotation, operating status and drive output information. An optional two-line LCD display is available.

Optional LCD Keypad Available

Typical Wiring Diagram

Wiring the ***VCM Series*** drive to your motor is easy. Simply decide how you want to control it, how the field connections should be terminated and program the drive to suit your needs.



* Note: Diagram applies to models rated up to 10HP at 240V and 15HP at 480V. Contact factory for power schematic for larger sizes.

Specifications

Control Characteristics	Control Mode	Sensorless Vector Control with Auto-tuning, or V/Hz control of three phase AC motors
	Carrier Frequency	2 - 16 KHz
	Frequency Control Range	0.1 - 400 Hz
	Speed Control Range	1:50 (Vector mode)
	Speed Control Precision	+ 0.5%
	Frequency Resolution	Digital: 0.01 Hz (Note 1); Analog: 0.06Hz/60 Hz (10bits)
	Frequency Setting Signal	Local: Built-in potentiometer or Up/Down keys on Operator Interface Remote: Analog Input or multifunction contacts on terminal block (TM2)
	ACCEL/DECEL Time	2 separately programmable ACCEL/DECEL times 0.1 - 3600 seconds with two S-curves Programmable DECEL or free run to stop
	Starting Torque	150%/ 1Hz (Vector mode)
	Braking Torque	Standard braking torque = 20%, 10% duty cycle (>20HP requires braking module option) 100% braking torque available with addition of optional braking resistors
	V/f Pattern	18 patterns, one curve programmable
	Frequency limit function	Upper/lower frequency limits, programmable skip frequencies and vibration control
Protection Functions	Instantaneous Overcurrent	Approximately 200% of unit rated current
	Overload Capacity of Drive	150% for 1 minute
	Motor Overload Protection	Programmable electronic thermal overload relay
	Overvoltage	200V Class: DC bus exceeds 410V 400V Class: DC bus exceeds 820V
	Undervoltage	200V Class: DC bus voltage drop < 190V 400V Class: DC bus voltage drop <380V
	Momentary Power Loss	Programmable 0~2 seconds: unit can be restarted via speed search
	DC Bus Protection	Motor coast to stop at blown fuse
	Heat Sink Fin Overheat	Protected by thermister/thermostat
	Ground Fault Protection	Standard on all units
	Stall Prevention	Stall prevention for Acceleration/Deceleration while running
Operation Conditions	Digital Inputs	Dry contacts through internal power supply: NPN/PNP toggle Multifunction Input Selection: 30 functions
	Digital Relay Outputs	(1) FORM C, (1) FORM A, 16 functions, 250 VAC 1A, 30 VDC 1A maximum
	Built-in Functions	Momentary power loss restart, speed search, overload detection, 8 preset speeds, accel/decel (2 stages), S-curves, 3-wire control, PID control, auto/manual torque boost, slip compensation, frequency upper/lower limit, auto energy savings, and auto reset
	Analog Inputs	AIN1: 0-20ma, 0-10 VDC, or external 10Kohm potentiometer Programmable offset and gain, positive or negative bias and slope AIN2: S6 multifunction input can be reconfigured to be 0 - 20mA or 0 -10 VDC analog input with offset/gain
	Analog Output (0-10 VDC)	Motor speed, voltage and current, DC bus voltage, PID feedback (all with gain calibration)
	Display function	Four digit LED (or 2x16 LCD optional) and status indicator; display frequency/ speed/line speed/DC voltage/output voltage/current/rotation direction/ Inverter parameter/trouble log/program version
	Communications	Control via RS232 or RS485 Modbus RTU One-to-one or One-to-many (RS485 Only) control Baud rate/Stop bit/Parity/ bit setting
Environmental Conditions and Approvals	Standard Enclosure	NEMA 1 (IP20), Chassis (HP dependent)
	Location and Altitude	Indoor (protected from gas and dust) 3,300 feet (without derating). Use in an enclosure with filtered forced ventilation, or if standalone, in a clean pollution-free environment
	Ambient Temperature	Enclosed: -10°C to 40°C (14°F to 104°F) Chassis: -10°C to 50°C (14°F to 122°F)
	Storage Temperature	-10°C to 50°C (14°F to 122°F)
	Humidity	0-95% non-condensing
	Vibration	1.0 G
	EMC	EN_61800-3
	LVD	EN_50178
	Approvals	UL listed and Canadian UL (cUL) listed, CE Approved

How to Order

VCM - 2 30 - □ - N

Select	Select	Select	Select
Voltage Class	Horsepower	Input Voltage	Enclosure
2 = 200 - 240V 4 = 380 - 480V		1 = Single Phase (Blank) = Three Phase	P = Panel N = NEMA 1 (IP20)

VCM Series

Input Voltage	Model Number	Rated Output Current	HP	KW	Dimensions		
					H	W	D
Single Phase 200 - 240V	VCM-2P5-1-P	3.1	0.5	0.4	6.42	3.55	5.79
	VCM-201-1-P	4.5	1	0.75	6.42	3.55	5.79
	VCM-202-1-P	7.5	2	1.5	7.37	5.04	5.83
	VCM-203-1-P	10.5	3	2.2	7.37	5.04	5.83
Three Phase 200 - 240V	VCM-2P5-P	3.1	0.5	0.4	6.42	3.55	5.79
	VCM-201-P	4.5	1	0.75	6.42	3.55	5.79
	VCM-202-P	7.5	2	1.5	6.42	3.55	5.79
	VCM-203-P	10.5	3	2.2	7.37	5.04	5.83
	VCM-205-P	17.5	5	3.7	7.37	5.04	5.83
	VCM-207-P	26	7.5	5.5	10.24	7.33	7.68
	VCM-210-P	35	10	7.5	10.24	7.33	7.68
	VCM-215-N	48	15	11	14.18	10.44	9.77
	VCM-220-N	64	20	15	14.18	10.44	9.77
	VCM-225-N	80	25	18.5	14.18	10.44	9.77
	VCM-230-N	96	30	22	25.69	10.60	10.91
	VCM-240-N*	130	40	30	25.69	10.60	10.91
Three Phase 380 - 480V	VCM-401-P	2.3	1	0.75	6.42	3.55	5.79
	VCM-402-P	3.8	2	1.5	6.42	3.55	5.79
	VCM-403-P	5.2	3	2.2	7.37	5.04	5.83
	VCM-405-P	8.8	5	3.7	7.37	5.04	5.83
	VCM-407-P	13	7.5	5.5	10.24	7.33	7.68
	VCM-410-P	17.5	10	7.5	10.24	7.33	7.68
	VCM-415-P	25	15	11	10.24	7.33	7.68
	VCM-420-N	32	20	15	14.18	10.44	9.77
	VCM-425-N	40	25	18	14.18	10.44	9.77
	VCM-430-N	48	30	22	14.18	10.44	9.77
	VCM-440-N*	64	40	30	21.79	10.60	11.98
	VCM-450-N*	80	50	37	21.79	10.60	11.98
	VCM-460-N*	96	60	45	25.73	12.14	12.17
	VCM-475-N*	128	75	55	25.73	12.14	12.17

Note: Dimensions are subject to change. See manual for mounting dimensions.
* Contact Factory for availability.

Options

The VCM Series includes options for every configuration. Cable extension kits, LCD Keypads, Communication cards and NEMA 1 kits are available. Contact factory for more information.

RS-232 Comm

Memory Pack

RS-485 Comm

Extension cable

Key Design Features

VCM Series - .5 to 75HP, 200 to 480V ratings

Sensorless Vector or V/Hz Control
- Maintain frequency accuracy to 0.01 Hz
- 150% starting torque, up to 200% running torque
- Autotuning for sensorless vector control

Built-in Electronic Overload Relay
- Program to match the exact motor FLA

Wide Frequency Output Range
- 0.1 - 400Hz with 18 selectable V/f patterns, one programmable custom curve

Adjustable Carrier Frequency
- Up to 16kHz for low noise applications

Heavy Duty Power Design
- 150% overload for 1 minute
- Maximizes power delivery, yet compact in size

Flexible Speed Command Choices
- Local via keypad or built-in potentiometer
- Remote via 4-20mA, 0-10Vdc, 0-5Vdc 10k ohm potentiometer or floating point (up-down) signal

7 Preset Speeds for Complete Process Control
- Selectable via digital inputs

Programmable I/O Maximizes System Design
- 6 digital inputs, 2 relay outputs
- 2 analog inputs, 1 analog output
- Analog inputs can be reconfigured for additional digital inputs

PID Function
- 8 PID modes
- Feedback loss detection
- Sleep function
- Engineering unit display

Small but Tough

Friendly

Not a word you often associate with industrial technology products, but it fits the VCM series from Motortronics. Known as the AC drive that is "easy to use...right out of the box," the VCM Series requires only a few simple setup steps and you are ready to run. A quick touch of the keypad or twist of the potentiometer for simple speed control... what could be easier?

Simple to use, but with the features you need... this is what the VCM Series is all about.

Hardworking

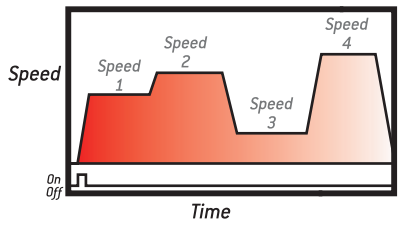
Heavy Duty Design
Built to be a "workhorse," the VCM Series design provides maximum thermal capacity in a compact package. Sensorless Vector Control allows full motor torque down to 1Hz.

Braking Intelligence
Standard units provide 20% braking torque with 100% braking capability by simply adding braking transistors and resistors. The VCM Series can stop the load quickly and safely for maximum productivity.

Creative

Built-in Process Timers
Seven timers can be used with pre-set speeds in sequential process applications for up to 60 minutes. Examples:
- Mix ingredient for 3 minutes at low, then blend at high speed for 1 hour
- Run product slowly through a conveyor oven for 12 minutes, then...
- On start command, run at set speed for 3 hours then turn off (add 3 presets together)

Timers can be setup for "on-delay" or "off-delay"



Dependable

Active Stall Prevention
Automatically adjusts the output to prevent nuisance trips due to rapid load changes

Vibration Reduction
Three selectable skip frequencies to reduce or eliminate mechanical vibration in the system.

The Company

Your best choice for Solid State Controls is a company that provides you with the attention, innovation and quality you deserve and these things can only come from a company dedicated to that one endeavor. We do one thing and we do it well, and with more field experience than any other motor control manufacturer that offers Solid State Controls. Our range of AC motor starting products is second to none with a commitment to quality in design.

The Product

At Motortronics, we believe in designing all of our products to be capable of controlling even the toughest loads. This "Heavy Duty Attitude" provides our customers with the greatest reliability, the most flexibility and the highest value for their electrical control budget.

The People

Motortronics headquarters in Clearwater, Florida, provides an experienced and knowledgeable Customer Service, Technical Support and Engineering staff to complement our manufacturing capabilities. Local support can also be obtained through our distributors and regional offices located in key industrial areas around the world.

No matter how you choose to start or protect your motor, you can always expect the best from Motortronics... in our products, our prices, our service and our support.

www.motortronics.com

MOTORTRONICS™

Solid State AC Motor Control

1600 Sunshine Drive • Clearwater, Florida 33765 USA
Tel: 727.573.1819 or 888.767.7792
Fax: 727.573.1803 or 800.548.4104
E-mail: motorctrl@aol.com
www: motortronics.com

International Sales and Service

Motortronics Int'l Korea Co Ltd
601, Daeryung Techno Tower 6-cha
Gasan-dong, Geumcheon-gu
Seoul, Korea (153-774)
Tel: 82-2-867-5806-8
Fax: 82-2-867-6004
www: motortronics-korea.com

M & P Machinery & Electronics Control
113 Zaoshan Road
Qingdao, China 266100
Tel: 86-532-7660633
Fax: 86-532-7660733
www: mp-cn.com