

VARISPEED

PRODUCT BROCHURE

ALPHA
DRIVE

HMV1000



WATER



OIL & GAS



INDUSTRY



MINING



MARINE



HVAC



AGRICULTURE

a member of the **Hudaco** group

Alpha Drive HVM1000



The Alpha Drive HVM1000 is a medium voltage drive providing speed and/or torque control for motor-driven applications in the medium and high power range from 315kW to 12 MW at motor voltages from 3.0kV to 10kV.



- **Compact design**
- **High performance**
- **Designed for maximum reliability, efficiency and versatility**

VOLTAGE	POWER

FEATURES & BENEFITS

The HVM1000 can be specified to control asynchronous or synchronous motors whether wound-rotor or permanent magnet.

- **SOLUTION FOR A WIDE RANGE OF INDUSTRIES**

- Cement, mining and minerals; chemical, oil and gas; metals; pulp and paper; power generation; water, renewable energy; other.

- **APPLICATIONS**

- Grinding mills, conveyors, fans, pumps, compressors, extruders, blast furnace blowers, gas turbine starters, ID/FD fans and pumps, wind turbines, tidal and wave energy generation, test stands and wind tunnels, mine hoists
- Very low levels of input current harmonics with high input power factor.

- Sinusoidal current output to motors – no significant temperature rise in the motor due to current harmonics.
- No significant motor shaft torque pulsations – kind to shaft coupling and mechanical load.
- Lower dV/dt voltage stress imposed on to the motor and cable insulation systems.
- Lower amplitude of PWM switching at the output significantly reduces potential transmission line effects when long output cables are used to the motor.
- Lower amplitude and frequency of PWM switching at the output significantly reduces potential for stray currents through the motor bearings.
- Use of low-voltage IGBTs which are easily obtainable, highly reliable and well-proven.

BASIC SPECIFICATIONS

- **OVERLOAD CAPACITY:** 180% 3s | 150% 60s
- **BUILT-IN C3 EMC FILTER**
- **AVR FUNCTION:** Rapid current limits
- **ALL MACROS FOR SPECIAL APPLICATION**
- **DC BRAKE:** Auto torque boost

- **ONE PARAMETER SETTING WATER SUPPLY CONTROL FUNCTIONS**
- **HIGH TORQUE LOW FREQUENCY:** 0.0Hz 150% at (FVC) | 0.3Hz, 150% (SVC)
- **PROGRAMMABLE I/O:**
5 * D1 & 2 * D0 | 1 * AI & 1 * AO | 1 * Relay

Exceptional drives offering real value, designed to global standards

MODEL DEFINITIONS

HV10 - R75 G3

1

2

3

4

HV100 - R75 P2

1

2

3

4

■ HV10 ■ HV100

HV10 / HV 100 SERIES INVERTERS

NO.	ADAPTIVE	NO.	ADAPTIVE
R75	0.75kW	R75	0.75kW
R5	5.5kW	1R5	1.5kW
-	-	011	11kW
-	-	015	15kW
CODE	INVERTER TYPE	CODE	INVERTER TYPE
G	General Type	G	General Type
-	-	P	Fan/Pump Type
CODE	INVERTER TYPE	CODE	INVERTER TYPE
1-2	Single phase 220V	2	3-phase 220V
3	3-phase 380V - 440V	3	3-phase 380V

INVERTER RATINGS

FREQUENCY INVERTER MODEL	INPUT CURRENT (A)	OUTPUT CURRENT (A)	MOTOR (KW) (HP)
G1 INPUT VOLTAGE RANGE: SINGLE PHASE AC 220V ±15%, 50 / 60 Hz			
HV10-R40G1-2	5.4	2.3	0.4
HV10-R75G1-2	8.2	4.0	0.75
HV10-1R5G1-2	14.0	7.0	1.5
HV10-2R2G1-2	23.0	9.6	2.2
HV 10 G3 INPUT VOLTAGE RANGE: THREE PHASE AC 380 - 440V (-15% +10%), 50 / 60 Hz			
HV10-R75G3	3.4	2.1	0.75
HV10-1R5G3	5.0	3.8	1.5
HV10-2R2G3	5.8	5.1	2.2
HV10-004G3	10.5	9.0	4.0
HV10-5R5G3	14.6	13.0	5.5
*HV 100 G3 INPUT VOLTAGE RANGE: THREE PHASE AC 380 - 440V (-15% +10%), 50 / 60 Hz			
HV100-R75G3	3.4	2.1	0.75
HV100-1R5G3	5.0	3.8	1.5
HV100-2R2G3	5.8	5.1	2.2
HV100-004G3	10.5	9.0	4.0
HV100-5R5G3	14.6	13.0	5.5
HV100-7R5G3	20.4	17	7.5
HV100-11G3	26	25	11
HV100-015G3	35	32	15
HV100-018G3	38.5	37	18.5
HV100-022G3	46.5	45	22
HV100-030G3	62	60	30

*Available up to 220kW - ratings available on request.

■ HV10 ■ HV100

PROVEN RELIABILITY | EXPERT SERVICE

ALPHA
DRIVE-VDE66

Alpha Drive HV10 & HV100



SPECIFICATIONS

■ HV10 ■ HV100

ITEM	DESCRIPTION		
RATED INPUT	Rated Voltage	■	Three-phase (G3/G4 series) 380V-480V, 50/60Hz
		■	Single & three-phase (G1/G2 series) 220V: 50/60Hz
	Frequency	■	Three-phase (G3/G4 series) 380V-480V, 50/60Hz
		■	Three-phase (G3 series): AC 380-440 (-15% +10%) Single & three-phase (G1/G2 series): AC 220V ±15%
OUTPUT	Allowable Range of Voltage Variation	■	Three-phase (G3 series): AC 380-440 (-15% +10%) Three-phase (G4 series): AC 460-480 (-15% +10%)
		■	Three-phase (G3 series): AC 380-440 (-15% +10%) Three-phase (G4 series): AC 460-480 (-15% +10%)
	Voltage	■	G1/G2 series: 0-220V, G3 series: 0-440V
		■	G1/G2 series: 0-220V, G3 series: 0-440V, G4 series: 0-480V
OVERLOAD CAPACITY	Frequency	■	0-999.9HZ
		■	Low frequency mode: 0-300Hz. High frequency mode: 0-3000Hz
	Overload Capacity	■	110% long-term 150% 1 minute 180% 5 seconds
		■	G type machine: 110% long-term 150% 1 minute 200% 4 seconds
CONTROL MODE	V/F Control, Vector Control		
	V/F Control, Advanced V/F Control, V/F Sensorless Vector Control		
CONTROL CHARACTERISTICS	Frequency Setting Resolution	Analogue Input	■ 0.1% of the maximum output frequency.
		Digital Settings	■ 0.1Hz.
	Frequency Accuracy	Analogue Input	■ Within 0.2% of the maximum output frequency.
		Digital Input	■ Set the output frequency within 0.01%.
	V/F Control	V/F curve (voltage frequency characteristic)	■ Three ways: the first is linear torque characteristic curve, the second is square torque characteristic curve, and the third is user-set V/F curve. ■ The reference frequency can be set arbitrarily from 0.5Hz to 3000Hz, and the multi-point V/F curve can be set arbitrarily. You can also choose a variety of fixed curves such as constant torque, torque reduction 1, torque reduction 2 and square torque.
		Torque Boost	■ Manual setting: 0.0 - 30.0% of rated output. ■ Automatic boost: automatically determine the boost torque according to the output current and motor parameters.
		Automatic current and voltage limiting	■ Whether in acceleration, deceleration or stable operation, the motor stator current and voltage can be automatically detected, which can be suppressed within the allowable range according to the unique algorithm to minimise the possibility of system fault tripping.
		Voltage frequency characteristic	■ Automatically adjust output voltage-frequency ratio according to motor parameters and unique algorithm.
	Sensorless Vector Control	Torque characteristic	■ Starting torque: 100% rated torque at 5.0Hz (VF control). 150% rated torque at 0.5Hz (sensorless vector control). ■ Starting torque: 150% rated torque at 3.0Hz (VF control). 150% rated torque at 1.0Hz (advanced VF control). 150% rated torque at 0.5Hz (SV control). Running speed steady-state accuracy: ≤ 0.2% rated synchronous speed. Speed fluctuation: ≤ 0.5% rated synchronous speed. Torque response: ≤ 20ms (SV control).
		Self Determination of Motor Parameters	■ Without any restriction, the parameters can be automatically detected under static and dynamic conditions to obtain the best control effect. Auto Tune
		Current & voltage suppression	■ Full-range current closed-loop control, completely avoiding current impact, with perfect overcurrent and overvoltage suppression function.
		Undervoltage Suppression During Operation	■ Especially for users with low grid voltage and frequent fluctuation of grid voltage, the system can maintain the longest possible operation time according to the unique algorithm and residual energy allocation strategy even in the range below the allowable voltage.

ELECTRONIC MOTOR CONTROL SOLUTIONS

Exceptional drives offering real value, designed to global standards

TYPICAL FUNCTIONS	Multi-stage Speed & Swing Frequency Operation		7-stage programmable multi-stage speed control and multiple operation modes are optional.
			16-stage programmable multi-stage speed control and multiple operation modes are optional. Swing frequency operation: preset frequency and centre frequency can be adjusted, and state memory and recovery after power failure.
	PID control RS485 communication		Built-in PID controller (preset frequency). Standard configuration RS485 communication function, multiple communication protocols can be selected, with linkage synchronous control function.
	Frequency Setting	Analogue input	DC voltage 0 - 10 V, DC current 0 - 20 mA (upper and lower limits are optional).
		Digital input	Operation panel setting, RS485 interface setting, UP/DOWN terminal setting, and various combination settings with analogue input can also be made.
	Output Signal	Digital output	One OC output and one relay output (TA,TC), with up to 17 functions
			Two Y-terminal open collector outputs and two programmable relay outputs (TA/TB/TC), with up to 61 functions.
		Analogue output	One AO, the output range can be flexibly set between 0-20mA or 0-10V, which can realise the output such as set frequency and output frequency, etc.
			Two analogue signals are output, and the output range can be flexibly set between 0-20mA or 1-10V, which can realise the output of physical quantities such as set frequency and output frequency.
	Automatic Voltage Stabilising Operation		According to requirements, three modes can be selected: dynamic voltage stabilisation, static voltage stabilisation and non-voltage stabilisation, so as to obtain the most stable operation effect.
	Acceleration / deceleration time setting		0.1S - 999.9min can be set continuously.
			0.1s - 3600.0min can be set continuously, and S-type and linear mode can be selected.
	Energy Consumption on Brake		Energy consumption braking starting voltage, return difference voltage and energy consumption braking rate can be continuously adjusted.
	Direct Current Brake		Starting frequency of DC braking during stop: 0.00 - [00.05] upper limit frequency. Braking time: 0.0 - 30.0s; Braking current: 0.0% - 50.0% of rated voltage of motor.
			Starting frequency of DC braking during shutdown: 0.00 - [000.13] upper limit frequency. Braking time: 0.0 - 100.0s. Braking current: 0.0% - 150.0% rated current.
	Magnetic Flow Brake		0 - 100.0: invalid
	Low Noise Operation		The carrier frequency is continuously adjustable from 2.0 kHz to 20.0 kHz (HV10) 1.0 kHz to 26.0 kHz (HV100) and to minimise the noise of the motor.
	Revolving Speed, Tracking Speed, Restart Facility		It can realise the smooth restart and instantaneous stop/restart of the motor in operation.
	Counter		One internal counter is convenient for system integration
	Operating Function		Upper and lower limit frequency setting, frequency jump operation, reverse operation limit, slip frequency compensation, RS485 communication, frequency increment and decrement control, fault self-recovery operation, etc.
KEYPAD DISPLAY	Running Status		Output frequency, output current, output voltage, motor speed, set frequency, module temperature, PID setting, PID feedback, analogue input and output, etc
	Alarm Content		Record a number of operating parameters such as output frequency, set frequency, output current, output voltage, DC voltage and module temperature during the last fault trip.
PROTECTION FUNCTION			Over-current, over-voltage, under-voltage, module failure, electronic thermal relay, overheating, short circuit, input and output phase failure, abnormal tuning of motor parameters, internal memory failure, etc.
ENVIRONMENT	Ambient Temperature		-10 ° C - +40 ° C (when the ambient temperature is 40 ° C - 50 ° C, please derate).
	Ambient Humidity		5% - 95% RH, no water condensation.
	Surrounding Environ.		Indoor (no direct sunlight, corrosion, flammable gas, oil mist, dust, etc.).
	Altitude		Derating for use above 1000 meters, every 1000 meters up derating 10%.
STRUCTURE	Protection Grade		IP20
	Cooling Mode		Air-cooled with fan control
INSTALLATION			Wall mounted, or cabinet mounted.

Alpha Drive HV10 & HV100



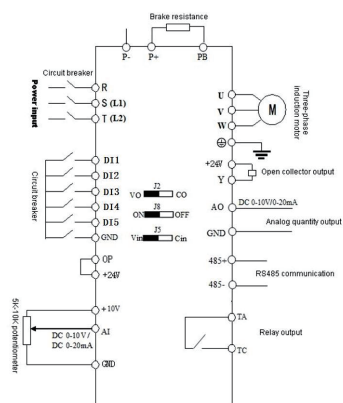
OVERALL DIMENSIONS

HV10
HV100

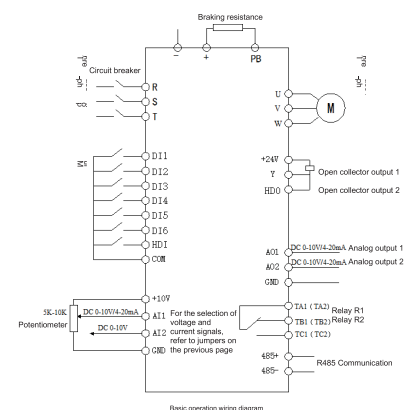
VOLTAGE LEVEL	MODEL	DIMENSIONS (mm)		
		W	H	D
1PH 220V	HV10-R40G1-2	60	160	134
	HV10-R75G1-2			
	HV10-1R5G1-2			
	HV10-2R2G1-2			
3PH 380V	HV10-R40G3			
	HV10-R75G3			
	HV10-1R5G3			
	HV10-2R2G3			
	HV10-004G3			
	HV10-5R5G3			
	78	200	152	
VOLTAGE LEVEL	MODEL	DIMENSIONS (mm)		
		W	H	D
3PH 380V	HV100-R75G3	95	212	154
	HV100-1R5G3			
	HV100-2R2G3			
	HV100-004G3			
	HV100-5R5G3	140	240	180,5
	HV100-7R5G3			
	HV100-011G3			
	HV100-015G3			
	HV100-018G3	205	322	190
	HV100-022G3			
	HV100-030G3			

BASIC OPERATING WIRING

HV10



HV100





**Exceptional drives offering
real value, designed to
global standards**



YOU MIGHT ALSO BE
INTERESTED IN

THE VARISPEED QUALITY ASSURANCE

We refuse to cut corners when it comes to quality; and support our customers throughout the entire lifecycle with superb products and tailored services.

At the core of Varispeed's competitiveness is an all-encompassing commitment to high standards and sophisticated quality controls. With many years of expertise in the field, and in-house coverage of all areas, we are able to offer comprehensive service that truly deserves the name "Total Customer Support". Automating with us is simply the smarter way to automate.



VERSATILE



REPUTABLE



RELIABLE



EFFECTIVE



VALUE-DRIVEN



COMPETENT



CERTIFIED

Certified service & repair centres with industry-leading warranties.



AVAILABLE

24/7/365 expert service & technical support.



WATER



OIL & GAS



INDUSTRY



MINING



MARINE



HVAC



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