YASKAWA

GA500 – Technical Specification

Control Characteristics	
Product	GA500
Type	Versatile Compact Drive
Rated Output Voltage (dependent on input)	Single Ph 200V Class : 200 to 240VAC
	Three Ph 200V Class : 200 to 240VAC
	Three Ph 400V Class : 380 to 480VAC
Motor Types	Induction Motor
	Permanent Magnet Motor (IPM/SPM)
	Synchronous Reluctancec Motor (SynRM)
Control Methods	V/f Control (V/f)
	Open Loop Vector Control (OLV)
	OLV for PM (OLV/PM)
	Advanced open loop vector control for PM (AOLV/PM)
	EZ Open Loop Vector Control (EZOLV)
Speed Control Range	1:40 for V/f
	1:100 for OLV
	1:10 for OLV/PM
	1:100 for AOLV/PM
	1:10 for EZOLV
Starting Torque	150% @3Hz for V/f
	150% @0.6Hz for OLV
	100% @10% speed for OLV/PM
	100% @0rpm for AOLV/PM
	100% @10% speed for EZOLV
Frequency Range	0 to 590Hz
Braking Transistor	Built-in for all ratings (20% braking torque)
Frequency Accuracy	Digital reference: within ±0.01% of the max. output frequency (-10°C to +40°C)

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	Analog reference: within ±0.1% of the max. output frequency (25°C±10°C)
Frequency Setting Resolution	Digital reference: 0.01 Hz
	Analog reference: 1/2048 of the maximum output frequency setting (11 bit)
Output Frequency Resolution	0.001 Hz
Torque Limit	Parameter settings allow separate limits in four quadrants in Open Loop Vector Control, Advanced Open Loop Vector Control for PM, and EZ Open Loop Vector Control.
Accel/Decel time	0.0 to 6000.0 seconds
Environmental Factors	
Ambient Temperature	-10˚C to +50˚C (No Deration required), Upto 60˚C with deration factor
Altitude	1000 m or less with no deration . Altitudes over 1000 m and up to 4000 m are possible by derating the output current by 1% for every 100 m.
Humidity	95% RH or less (no condensation)
Surrounding Area	Pollution degree 2 or less
Shock	10 Hz to 20 Hz, 1 G (9.8 m/s2)
	20 Hz to 55 Hz, 0.6 G (5.9 m/s2)
Area of Use	Indoors
Protection Features	
Motor Protection	Motor overheat protection based on output current
Momentary Overcurrent Protection	Drive stops when output current exceeds 200% of the HD output current. Note: 200% is the target value. The value varies depending on the capacity.
Overload Protection	Drive stops when the output current exceeds these overload tolerances. ・ HD Rating: 150% of the drive rated output current for 60 s.
	・ ND Rating: 110% of the drive rated output current for 60 s.
Overvoltage Protection	200 V class: Stops when the DC bus voltage is more than approximately 410 V
	400 V class: Stops when the DC bus voltage is more than approximately 820 V
	200 V class: Stops when the DC bus voltage decreases to less than approximately 190 V

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Undervoltage Protection	400 V class: Stops when the DC bus voltage decreases to less than approximately 380 V
Momentary Power Loss Ride-Thru	Stops when power loss is longer than 15 ms.
	Continues operation if power loss is shorter than 2 s (depending on parameter settings).
Heatsink Overheat Protection	Thermistor
Stall Prevention	Stall prevention during acceleration/deceleration and constant speed operation
Ground Fault Protection	Protection by electronic circuit
Charge LED	Charge LED illuminates when DC bus voltage is more than 50 V.
Standards Compliance	UL61800-5-1
	EN61800-3
	IEC/EN61800-5-1
	Two Safe Disable inputs and 1EDM output according to ISO/EN13849-1 Cat.3 Ple,IEC/EN61508 SIL3
Power Specifications	
Rated input Voltage/Frequency	400V Class: ・Three-phase AC power supply 380 V to 480 V 50/60 Hz ・DC power supply 513 V to 679 V
	200V Class : ・Single-phase or Three-phase AC power supply 200 V to 240 V 50/60 Hz ・DC power supply 270 V to 340 V
Allowable Voltage Fluctuation	−15% to 10%
Allowable Frequency Fluctuation	±5%
Common Specifications	
Carrier Frequency	Derating the output current enables a maximum of 15 kHz to be set.
Multi Function Digital Inputs	7 Digital Inputs (NPN or PNP) , 24VDC. External and internal power source possible

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Multi Function Digital Outputs	1 Programmable Relay with MA-MB-MC (AC 250 V, max. 1 A DC 30 V, max. 1 A min. load DC 5 V, 10 mA) , 2 programmable Photocouplers P1-C1 and P2-C2 (DC 48 V, max. 50 mA)
Multi Function Analog Inputs	1 Multi function Analog input A1 (-10 – +10 V (20 kΩ))
	1 Multi Function Analog input A2 (0 – 10 V (20 kΩ), 4 – 20 mA (250 Ω)/0 – 20 mA (250 Ω))
Multi Function Analog Output	1 Multi function Analog output AM-AC (0 – 10 V/4 – 20 mA (250 Ω))
Pulse Train	1 Pusle Train output (0 – 32 kHz (2 kΩ))
	1 Pulse Train input (max 32mA)
Serial communication	MEMOBUS/Modbus (RTU mode) comm. RS-485, Max. 115.2 kbps
DC Supply	DC 24 V Power supply, Output 24 V, max. 150 mA
Optional communication Protocols	Mechatrolink, Profibus, Profinet, Ethernet TCP/IP, Modbus TCP/IP, CC-Link, Canopen, Bacnet, Devicenet, EtherCAT
Programming Interface	Serial port or Mini-USB in front of VFD
Additional Functions	Feed Forward Control, Momentary Power Loss Ride-Thru, Speed Search, Overtorque detection, torque limit, 17 Step Speed (max.), accel/decel switch, S-curve accel/decel, 3-wire sequence, Auto-Tuning (rotational, stationary), Dwell, cooling fan on/off switch, slip compensation, torque compensation, Frequency Jump, Upper/lower limits for frequency reference, DC Injection Braking at start and stop, Overexcitation Deceleration, High Slip Braking, PID control (with Sleep function), Energy Saving Control, MEMOBUS/Modbus (RTU mode) Communications (RS-485, max. 115.2 kbps), Fault Restart, Application Presets, DriveWorksEZ (customized functions), Parameter Backup Function, Online Tuning, KEB, Overexcitation Deceleration, Overvoltage Suppression, High Frequency Injection, Zero Speed Control, etc.