YASKAWA

A1000 – Technical Specification

Control Characteristics	
Product	A1000
Type	General Purpose AC drive with advanced vector control
Rated Output Voltage (dependent on input)	Three Ph 200V Class : 200 to 240VAC Three Ph 400V Class : 380 to 480VAC
Motor Types	Induction Motor, Permanent Magnet Motor (SPM)
Control Methods	V/f Control, V/f Control with PG, Open Loop Vector Control, Closed Loop Vector Control, Open Loop Vector Control for PM, Advanced Open Loop Vector Control for PM, Closed Loop Vector Control for PM
Speed Control Range	V/f Control 1:40 Open Loop Vector Control 1:200 Open Loop Vector Control for PM 1:20 Closed Loop Vector Control for PM 1:1500 V/f Control with PG 1:40 Closed Loop Vector Control 1:1500 Advanced Open Loop Vector Control for PM 1:100
Starting Torque	V/f Control 150%/3 Hz Open Loop Vector Control 200%/0.3 Hz Open Loop Vector Control for PM 100%/5% speed Closed Loop Vector Control for PM 200%/0 min–1 V/f Control with PG 150%/3 Hz Closed Loop Vector Control 200%/0 min–1 Advanced Open Loop Vector Control for PM 200%/0 min–1
Frequency Range	0.01 to 400Hz
Braking Transistor	Built-in upto 30kW HD rating
Frequency Accuracy	Digital reference: within ±0.01% of the max. output frequency (-10°C to +40°C) Analog reference: within ±0.1% of the max. output frequency (25°C±10°C)
Frequency Setting Resolution	Digital reference: 0.01 Hz, Analog reference: 0.03 Hz / 60 Hz (11 bit)
Output Frequency Resolution	0.001 Hz
Torque Limit	All vector control modes allow separate settings in four quadrants

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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	Up to 1000 meters (derating required at altitudes from 1000 m to 3000 m)
Humidity	95% RH or less (no condensation)
Surrounding Area	Pollution degree 2 or less
Shock	10 Hz to 20 Hz, 9.8 m/s2 max. 〔5.9 m/s2 for models larger than 400 V 450 kW (when set for Heavy Duty performance)〕 20 Hz to 55 Hz, 5.9 m/s2〔 200 V: 45 kW or more, 400 V: 75 kW or more (when set for Heavy Duty performance)〕 or 2.0 m/s2 max. 〔200 V: 55 kW or less, 400 V: 90 kW or less (when set for Heavy Duty performance)〕
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.
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: 120% 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
Undervoltage Protection	200 V class: Stops when the DC bus voltage decreases to less than approximately 190 V 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).

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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	UL508C ,IEC/EN61800-3,IEC/EN61800-5-1 Two Safe Disable inputs and 1EDM output according to ISO/EN13849-1 Cat.3 PLd, IEC/EN61508 SIL2
Power Specifications	
Rated input Voltage/Frequency	400V Class: Three-phase AC power supply: 380 to 480 Vac 50/60 Hz, DC power supply: 510 to 680 Vdc 200V Class : Three-phase AC power supply: 200 to 240 Vac 50/60 Hz, DC power supply: 270 to 340 Vdc
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.(Based on rating)
Multi Funcction Digital Inputs	8 Digital Inputs (NPN or PNP)
Multi Function Digital Outputs	1 Programmable Relay M1-M2 (AC 250 V, max. 1 A DC 30 V, max. 1 A min. load DC 5 V, 10 mA), 1 fault relay MA-MB-MC, 2 photcouplers P1,P2 (48 Vdc, max. 50 mA)
Multi Function Analog Inputs	3 Multi function Analog input A1(0 to 10 Vdc (20 kΩ)), A2(0 to 10 Vdc (20 k) 4 to 20 mA / 0 to 20 mA (250)) & A3 (0 to 10 Vdc (20 kΩ)
Multi Function Analog Output	2 Multi function Analog outputs FM-AC & AM-AC (−10 to +10 Vdc (2 mA))
Pulse Train	1 Pusle Train output (0 – 32 kHz (2 kΩ)) 1 Pulse Train input (max 32mA)

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Serial communication	MEMOBUS/Modbus (RTU mode) comm. RS-485, Max. 115.2 kbps
Optional communication Protocols	Mechatrolink, Profibus, Profinet, Ethernet TCP/IP, Modbus TCP/IP, CC-Link, Canopen, Bacnet, Devicenet, EtherCAT, Lonworks
Programming Interface	Serial port or USB B port in front of VFD
Additional Functions	Torque Control, Droop Control, Speed/Torque Control switch, Feed Forward Control, Zero Servo Control, Momentary Power Loss Ride-Thru, Speed Search, Overtorque detection, torque limit, 17 Step Speed (max.), accel/decel time switch, S-curve accel/decel, 3-wire sequence, Auto-Tuning (rotational, stationary), Online Tuning, 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) comm. (RS-485/422, max. 115.2 kbps), Fault Restart, Application Presets, DriveWorksEZ (customized functions), Removable Terminal Block with Parameter Backup.