

High Performance Drive GA700

200 V Class

HD: Heavy Duty, ND: Normal Duty

Catalog Code GA70A2:			004	006	008	010	012	018	021	030	042	056	070	082	110	138	169	211	257	313	360	415
Max. Applicable Motor Capacity*1	kW	HD	0.4	0.75	1.1	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
		ND	0.75	1.1	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	-
Input Rated Input Current	A	HD	3.6	4.8	6.7	8.9	12.7	17	20.7	30	40.3	58.2	78.4	96	82	111	136	164	200	271	324	394
		ND	4.8	6.7	8.9	12.7	17	20.7	30	40.3	52	78.4	96	114	111	136	164	200	271	324	394	-
Output Rated Output Current	A	HD	3.2	5	6.9	8	11	14	17.5	25	33	47	60	75	88	115	145	180	215	283	346	415
		ND	3.5	6	8	9.6	12.2	17.5	21	30	42	56	70	82	110	138	169	211	257	313	360	-
Output	Overload Tolerance		· HD Rating: 150% of rated output current for 60 s · ND Rating: 110% of rated output current for 60 s Note: Derating may be required for applications that start and stop frequently.																			
	Carrier Frequency		Derating the output current enables a maximum of 15 kHz to be set. (Derating the output current is not necessary for an ND rating of 2 kHz and an HD rating up to 8 kHz.)															Derating the output current enables a maximum of 10 kHz to be set. (Derating the output current is not necessary for an ND rating of 2 kHz and an HD rating up to 5 kHz.)				
	Max. Output Voltage		Three-phase 200 to 240 V Note: The maximum output voltage is proportional to the input voltage.																			
	Max. Output Frequency		590 Hz The frequencies that can be set vary depending on the control mode used.																			
Power	Rated Voltage/ Rated Frequency		· 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%																			
	Power Supply*2		kVA	1.5	2.0	2.8	3.7	5.3	7.1	8.6	12.5	16.8	24.2	32.6	39.9	34.1	46.1	56.5	68.2	83.1	113	135
		ND	2.0	2.8	3.7	5.3	7.1	8.6	12.5	16.8	21.6	32.6	39.9	47.4	46.1	56.5	68.2	83.1	113	135	164	-

400 V Class

Catalog Code GA70A4:			002	004	005	007	009	012	018	023	031	038	044	060	075	089	103
Max. Applicable Motor Capacity*1	kW	HD	0.4	0.75	1.5	2.2	3.0	3.7	5.5	7.5	11	15	18.5	22	30	37	45
		ND	0.75	1.5	2.2	3.0	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Input Rated Input Current	A	HD	1.9	3.5	4.7	6.7	8.9	11.7	15.8	21.2	30.6	41.3	50.5	43.1	58.3	71.5	86.5
		ND	2.5	4.7	6.7	8.9	11.7	15.8	21.2	30.6	41.3	50.5	59.7	58.3	71.5	86.5	105
Output Rated Output Current	A	HD	1.8	3.4	4.8	5.5	7.2	9.2	14.8	18	24	31	39	45	60	75	91
		ND	2.1	4.1	5.4	7.1	8.9	11.9	17.5	23.4	31	38	44	59.6	74.9	89.2	103
Output	Overload Tolerance		· HD Rating: 150% of rated output current for 60 s · ND Rating: 110% of rated output current for 60 s Note: Derating may be required for applications that start and stop frequently.														
	Carrier Frequency		Derating the output current enables a maximum of 15 kHz to be set. (Derating the output current is not necessary for an ND rating of 2 kHz and an HD rating up to 8 kHz.)														
	Max. Output Voltage		Three-phase 380 to 480 V Note: The maximum output voltage is proportional to the input voltage.														
	Max. Output Frequency		590 Hz The frequencies that can be set vary depending on the control mode used.														
Power	Rated Voltage/ Rated Frequency		· Three-phase AC power supply 380 V to 480 V 50/60 Hz · DC power supply 513 V to 679 V														
	Allowable Voltage Fluctuation		-15% to 10%														
	Allowable Frequency Fluctuation		±5%														
	Power Supply*3		kVA	1.5	2.8	3.7	5.3	7.1	9.3	13	17	24	33	40	34	46	57
		ND	2.0	3.7	5.3	7.1	9.3	13	17	24	33	40	48	46	57	69	84

Catalog Code GA70A4:			140	168	208	250	296	371	389	453	568	675		
Max. Applicable Motor Capacity*1	kW	HD	55	75	90	110	132	160	200	220	250	315		
		ND	75	90	110	132	160	200	220	250	315	355		
Input Rated Input Current	A	HD	105	142	170	207	248	300	373	410	465	584		
		ND	142	170	207	248	300	373	410	465	584	657		
Output Rated Output Current	A	HD	112	150	180	216	260	304	371	414	453	605		
		ND	140	168	208	250	296	371	389	453	568	675		
Output	Overload Tolerance		· HD Rating: 150% of rated output current for 60 s · ND Rating: 110% of rated output current for 60 s Note: Derating may be required for applications that start and stop frequently.											
	Carrier Frequency		Derating the output current enables a maximum of 10 kHz to be set. (Derating the output current is not necessary for an ND rating of 2 kHz and an HD rating up to 5 kHz.)							Derating the output current enables a maximum of 5 kHz to be set. (Derating the output current is unnecessary for ND/HD rating up to 2 kHz)				
	Max. Output Voltage		Three-phase 380 to 480 V Note: The maximum output voltage is proportional to the input voltage.											
	Max. Output Frequency		590 Hz The frequencies that can be set vary depending on the control mode used.											
Power	Rated Voltage/ Rated Frequency		· Three-phase AC power supply 380 V to 480 V 50/60 Hz · DC power supply 513 V to 679 V											
	Allowable Voltage Fluctuation		-15% to 10%											
	Allowable Frequency Fluctuation		±5%											
	Power Supply*3		kVA	84	113	136	165	198	239	297	327	370	465	
		ND	113	136	165	198	239	297	327	370	465	523		

*1: The rated output current of the drive output amps should be equal to or greater than the motor rated current.

*2: Rated input capacity is calculated with a power line voltage of 240 V.

*3: Rated input capacity is calculated with a power line voltage of 480 V.

Common Specifications

Item	Specifications
Control Method	<p>The following controls are selected by parameters.</p> <ul style="list-style-type: none"> - V/f Control - Open Loop Vector Control - Advanced Open Loop Vector Control - Advanced Open Loop Vector Control for PM - EZ Open Loop Vector Control <ul style="list-style-type: none"> - Closed Loop V/f Control - Closed Loop Vector Control - Open Loop Vector Control for PM - Closed Loop Vector Control for PM
Maximum Output Frequency	<ul style="list-style-type: none"> - Advanced Open Loop Vector Control, EZ Open Loop Vector Control: 120 Hz - Closed Loop V/f Control, Closed Loop Vector Control, Advanced Open Loop Vector Control for PM, Closed Loop Vector Control for PM: 400 Hz - V/f Control, Open Loop Vector Control, Open Loop Vector Control for PM: 590 Hz
Frequency Accuracy (Temperature Fluctuation)	<p>Digital reference: within $\pm 0.01\%$ of the max. output frequency (-10°C to $+40^{\circ}\text{C}$) Analog reference: within $\pm 0.1\%$ of the max. output frequency ($25^{\circ}\text{C} \pm 10^{\circ}\text{C}$)</p>
Frequency Setting Resolution	<p>Digital reference: 0.01 Hz Analog reference: 1/2048 of the maximum output frequency setting (11 bit plus sign)</p>
Output Frequency Resolution	0.001 Hz
Frequency Setting Resolution	<p>Main frequency reference: -10 to $+10$ Vdc, 0 to 10 Vdc (20 kΩ), 4 to 20 mA (250 Ω), 0 to 20 mA (250 Ω) Main speed reference: Pulse train input (max. 32 kHz)</p>
Starting Torque	<ul style="list-style-type: none"> - V/f Control: 150%/3 Hz - Open Loop Vector Control: 200%/0.3 Hz** - Advanced Open Loop Vector Control: 200%/0.3 Hz** - Advanced Open Loop Vector Control for PM: 200%/0 min^{-1**} - EZ Open Loop Vector Control: 100%/1% speed <ul style="list-style-type: none"> - Closed Loop V/f Control: 150%/3 Hz - Closed Loop Vector Control: 200%/0 min^{-1**} - Open Loop Vector Control for PM: 100%/5% speed - Closed Loop Vector Control for PM: 200%/0 min^{-1**} <p>Note: To achieve specifications listed for Advanced Open Loop Vector Control for PM: Set n8-57 to 1 (High frequency injection is enabled), and perform Rotational Auto-Tuning to drive a non-Yaskawa PM motor.</p>
Speed Control Range	<ul style="list-style-type: none"> - V/f Control 1:40 - Open Loop Vector Control 1:200 - Advanced Open Loop Vector Control 1:200 - Advanced Open Loop Vector Control for PM 1:100 - EZ Open Loop Vector Control 1:100 <ul style="list-style-type: none"> - Closed Loop V/f Control 1:40 - Closed Loop Vector Control 1:1500 - Open Loop Vector Control for PM 1:20 - Closed Loop Vector Control for PM 1:1500 <p>Note: 1. To achieve specifications listed for Advanced Open Loop Vector Control for PM: Set n8-57 to 1 (High frequency injection is enabled), and perform Rotational Auto-Tuning to drive a non-Yaskawa PM motor. 2. Advanced Open Loop Vector Control for PM 1:100 is valid in the momentary operation region. When using the motor continuously, it is necessary to consider the capacity of the GA700 and the motor.</p>
Zero Speed Control	Possible in Closed Loop Vector Control, Advanced Open Loop Vector Control for PM, and Closed Loop Vector Control for PM.
Torque Limit	Parameter settings allow separate limits in four quadrants in Open Loop Vector Control, Closed Loop Vector Control, Advanced Open Loop Vector Control, Advanced Open Loop Vector Control for PM, Closed Loop Vector Control for PM, and EZ Open Loop Vector Control.
Accel/Decel Time	0.0 s to 6000.0 s The drive allows four selectable combinations of independent acceleration and deceleration settings.
Braking Torque	<p>Approx. 20% Approx. 125% with a dynamic braking option</p> <ul style="list-style-type: none"> - Short-time average deceleration torque - Motor capacity 0.4/0.75 kW: over 100% - Motor capacity 1.5 kW: over 50% - Motors 2.2 kW and larger: over 20%, Overexcitation Braking / High Slip Braking allow for approx. 40% - Continuous regenerative torque: Approx. 20%. Dynamic braking option allows for approx. 125%, 10% ED, 10 s <p>Note: 1. Catalog codes GA700□2004 to 2138 and 4002 to 4168 have a built-in braking transistor. 2. Set L3-04 = 0 [Stall Prevention during Decel = Disabled] when using a regenerative converter, regenerative unit, braking unit, braking resistor, or braking resistor unit. The drive could possibly not stop within the specified deceleration time when L3-04 = 1 [General Purpose](default). 3. Short-time deceleration torque refers to the torque required to decelerate the motor (uncoupled from the load) from the rated speed to zero. Actual specifications may vary depending on motor characteristics. 4. Continuous regenerative torque and short-time deceleration torque for motors 2.2 kW and larger vary depending on motor characteristics.</p>
V/f Characteristics	Select from 15 predefined V/f patterns, or a user-set V/f pattern.
Main Control 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 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-485/422, max. 115.2 kbps), Fault Restart, Application Presets, DriveWorksEZ (customized functions), Parameter Backup Function, Online Tuning, KEB, Overexcitation Deceleration, Inertia Tuning and ASR Tuning, Overvoltage Suppression, High Frequency Injection, etc.
Standards Compliance	<ul style="list-style-type: none"> - UL61800-5-1 - EN61800-3:2004+A1:2012 - IEC/EN61800-5-1 - ISO/EN13849-1 Cat.3 PLc. IEC/EN61508 SIL3 (Two Safe Disable inputs and one EDM output) <p>Note: Used by setting functions to multi-function digital output terminals.</p> <ul style="list-style-type: none"> - RCM*5 - EAC*5 - CSA*5 <p>[Ship Classification Standards]</p> <ul style="list-style-type: none"> - NK*5 - DNV GL*5 - LR*5 - ABS*5 - BV*5 - KR*5
Protection Design	IP20/UL Open Type, IP20/UL Type 1 Note: Install a UL Type 1 kit on an IP20/UL Open Type drive to convert the drive to IP20/UL Type 1.

*4: Increase the drive and motor capacities.

*5: Planning

Note: Perform Rotational Auto-Tuning to achieve specifications listed for Open Loop Vector Control and Advanced Open Loop Vector Control.