

GA500 Data Sheet

AC Microdrive for Industrial Applications

Data Sheet

Type: **CIPR-GA50Cxxxxxxxx**
200 V Class, Three-Phase Input: 0.1 to 22 kW
200 V Class, Single-Phase Input: 0.1 to 4.0 kW
400 V Class, Three-Phase Input: 0.37 to 30 kW



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Introduction

GA500 is a general-purpose drive for industrial use. Applications range from simple motor control of pumps or fans up to more demanding compressors, transport systems, positioning tasks etc.

Key attributes are ease of use, flexibility and sustainability. Loaded with valuable features and functions GA500 drives greatly simplifies system designs and maximize system and machine performance while reducing the effort for installation and setup to a minimum.



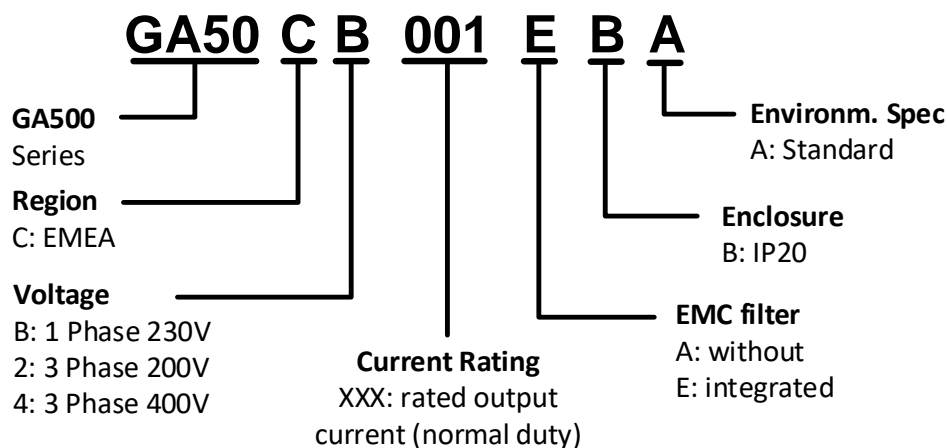
Drive Selection

GA500 drives must be selected according to power supply voltage, motor rated current, load profile of the application, and ambient condition of the area they are operated in.

GA500 standard drives offer two separate performance ratings: Heavy Duty and Normal Duty. In Heavy Duty the GA500 can run applications with constant torque and heavy overload of up to 150% for 1 minute, such as hoist, conveyors, presses, certain types of compressors, etc. Normal Duty is intended to drive applications with variable torque characteristics and low overload demand of not more than 110% for 1 minute, such as fans, blowers, pumps, etc. Normal Duty allows the drive to operate a one size larger motor than in Heavy Duty rating.

GA500 drives are designed to be wall mounted upright and in clean environmental condition. In case of special mounting methods (heatsink external, horizontal, etc.), high ambient temperature (>50 °C), high altitude (> 1000 m), use of high carrier frequency, and so forth, an output current derating must be considered when selecting the drive.

Model Designation



List of Models

Input Voltage [Vac]	Power Heavy Duty [kW]	Model Code	
		With integrated EMC Filter	Without EMC Filter
1x230	0.1	GA50CB001EBA	GA50CB001ABA
1x230	0.2	GA50CB002EBA	GA50CB002ABA
1x230	0.55	GA50CB004EBA	GA50CB004ABA
1x230	0.75	GA50CB006EBA	GA50CB006ABA
1x230	1.5	GA50CB010EBA	GA50CB010ABA
1x230	2.2	GA50CB012EBA	GA50CB012ABA
1x230	4.0	-	GA50CB018ABA
3x230	0.1	GA50C2001EBA	GA50C2001ABA
3x230	0.2	GA50C2002EBA	GA50C2002ABA
3x230	0.55	GA50C2004EBA	GA50C2004ABA
3x230	0.75	GA50C2006EBA	GA50C2006ABA
3x230	1.1	GA50C2008EBA	GA50C2008ABA
3x230	1.5	GA50C2010EBA	GA50C2010ABA
3x230	2.2	GA50C2012EBA	GA50C2012ABA
3x230	3	GA50C2018EBA	GA50C2018ABA
3x230	4	GA50C2021EBA	GA50C2021ABA
3x230	5.5	GA50C2030EBA	GA50C2030ABA
3x230	7.5	GA50C2042EBA	GA50C2042ABA
3x230	11	GA50C2056EBA	GA50C2056ABA
3x230	15	GA50C2070EBA	GA50C2070ABA
3x230	18.5	GA50C2082EBA	GA50C2082ABA
3x400	0.4	GA50C4001EBA	GA50C4001ABA
3x400	0.55	GA50C4002EBA	GA50C4002ABA
3x400	0.75	GA50C4004EBA	GA50C4004ABA
3x400	1.5	GA50C4005EBA	GA50C4005ABA
3x400	2.2	GA50C4007EBA	GA50C4007ABA
3x400	3	GA50C4009EBA	GA50C4009ABA
3x400	4	GA50C4012EBA	GA50C4012ABA
3x400	5.5	GA50C4018EBA	GA50C4018ABA
3x400	7.5	GA50C4023EBA	GA50C4023ABA
3x400	11	GA50C4031EBA	GA50C4031ABA
3x400	15	GA50C4038EBA	GA50C4038ABA
3x400	18.5	GA50C4044EBA	GA50C4044ABA
3x400	22	GA50C4060EBA	GA50C4060ABA

General specification

Item	Description
Product Name	GA500
Power Range	1-phase 200~240 V: 0.1 to 4 kW (HD) / 2.2 kW (ND) 3-phase 200~240 V: 0.1 to 22 kW (ND) 3-phase 380~400 V: 0.1 to 30 kW (ND)
Rated Input Frequency	50 Hz
Allowable Voltage Fluctuation	-15 to +10%
Allowable Frequency Fluctuation	±5%
DC Supply	200 V class: 270 to 340 Vdc 400 V class: 513 to 679 Vdc
Overload Tolerance	HD: 150% of rated output current for 60 s ND: 110% of rated output current for 60 s (allowable every 9 mins after overload 1 min)
DC Reactor	External
Braking Transistor	Built in
Applicable Motor Types	Induction / PM / Synchronous Reluctance
Maximum Output Frequency	Induction Motor: 590 Hz PM Motor – Vector Control: 590 Hz PM Motor – Advanced Vector Control: 270 Hz IM/PM/SynRM – EZ Vector Control: 120 Hz
Output frequency resolution	0.001 Hz
Starting Torque	V/f control (IM): 150% @ 3 Hz Vector Control (IM): 150% @ 0.6 Hz Vector Control (PM): 100% @ 10% speed Advanced Vector Control (PM): 100% @ 0 rpm EZ Vector (IM/PM/SynRM): 100% @ 1% speed
Speed Control Range	V/f control (IM): 1:40 Vector Control (IM): 1:100 Vector Control (PM): 1:10 Advanced Vector Control (PM): 1:100 EZ Vector (IM/PM/SynRM): 1:10
Zero Speed Control	Possible with Advanced Vector Control for PM, sensorless, IPM motor
Torque Limit Control	Possible in Vector Control (IM/PM) and Advanced Vector Control (PM), sensorless, 4 quadrants individually adjustable
Acceleration/Deceleration Ramps	4 individual, 0 to 6000 s linear, 4 separately adjustable S-curves
Braking Torque	Approx. 20% without braking resistor, approx. 125% with braking resistor
V/f Pattern	Freely adjustable
Protection	<ul style="list-style-type: none"> • Motor electronic thermistor function • Motor PTC input • Instantaneous over current at 200% of rated current • Drive over load 150% (HD) / 110% (ND) for 1 min, once per 10 min • DC over voltage at 420 Vdc (230 V units) / 820 Vdc (400 V units) • Output ground fault • Motor stall prevention
Software Functions	<ul style="list-style-type: none"> • Power outage ride through control • PID control • Speed search (catch coasting motor) • Over-/undertorque detection • 17-step multi-speed operation • Resonance frequency avoidance • Motor data auto-tuning rotating/in stop condition • Dwell function • Cooling fan control by heatsink temperature • Reference limiter • DC brake • Overexcitation braking / High-slip braking • Energy saving • Parameter copy function • DC over voltage suppression

Ambient Conditions	Place of Installation: <ul style="list-style-type: none"> • Indoors, no direct sunlight • free from oil, mist, flammable gases, metal powder, oil, water, salt, harmful gases and liquids, solvents Operation temperature: <ul style="list-style-type: none"> • IP20: -10 to +50°C (up to 60°C with derating) • UL type 1: -10 to +40°C • Side-by-Side mounting: -10 to +40°C (up to 50°C with derating) Storage temperature: -20 to +70°C Humidity: 95% RH, no condensation Overvoltage category: III Pollution degree: 2 or less Altitude: up to 1000m, up to 4000m with 1% current derating per 100 m
Vibration Resistance	10 to 20 Hz – 1 g (9.81 m/s ²); 20 to 55 Hz – 0.6 g (5.9 m/s ²)
Standards	<ul style="list-style-type: none"> • UL61800-5-1 • EN61800-2 • IEC/EN61800-5-1 • ISO/EN13849-1 Cat. III PLe, IEC/EN61508 SIL3 (2 Safety inputs, 1 EDM output)
Enclosure	<ul style="list-style-type: none"> • IP20 • UL type 1
Communication	<ul style="list-style-type: none"> • Modbus/Memobus embedded via built in RS485 interface, 115.2 kBps
Programming Interface	<ul style="list-style-type: none"> • Built in removable LED keypad with soft buttons • Built in USB mini port for connection a PC or Android Smart Device • Serial through keypad port (needs adapter)
Programming Tools	<ul style="list-style-type: none"> • DriveWizard 10 (Windows 10) • DriveWizard mobile (Android and iOS)
PLC logic / Application Programming	<ul style="list-style-type: none"> • Programmable in DriveWorksEZ, up to 100 connections (DWEZ Pro) or 25 connections (DWEZ Standard), 2 ms scan time

Power Ratings

Three-phase 200 V Units

CIPR-GA50A2□□□□		0001	0002	0004	0006	0008	0010	0012	0018	0021	0030	0042	0056	0070	0082
Maximum Applicable Motor Capacity (kW)	HD	0.1	0.2	0.55	0.75	1.1	1.5	2.2	3	4.0	5.5	7.5	11	15	18.5
	ND	0.2	0.4	0.75	1.1	1.5	2.2	3	4.0	5.5	7.5	11	15	18.5	22
Input Current (A)	HD	0.7	1.5	2.9	5.8	7.0	7.5	11	15.6	18.9	24	37	52	68	96
	ND	1.1	1.9	3.9	7.3	8.8	10.8	13.9	18.5	24	37	52	68	80	114
Rated Output Current (A)	HD	0.8	1.6	3.0	5.0	6.9	8.0	11.0	14.0	17.6	25.0	33.0	47.0	60.0	75.0
	ND	1.2	1.9	3.5	6	8	9.6	12.2	17.5	21	30	42	56	70	82
Carrier Frequency	HD	10 kHz						8kHz							
	ND	2 kHz													
Maximum Output Voltage	Three-phase 200~240V (proportional to input voltage)														
EMC Filter	Built in (IEC61800-3 Category 3, 20 m shielded motor cable), version without filter available														
AC Power Supply	Voltage: Three-phase AC power supply: 200~240V -15/+10% Frequency: 50/60Hz +/- 5%														
DC Power Supply	270 to 340 Vdc														

Single-phase 200 V Units

CIPR-GA50AB□□□□		0001	0002	0004	0006	0010	0012	0018	
Maximum Applicable Motor Capacity (kW)	HD	0.1	0.2	0.55	0.75	1.5	2.2	4.0	
	ND	0.2	0.4	0.75	1.1	2.2	3.0	N/A	
Input Current (A)	HD	1.4	2.8	5.5	11	14.1	20.6	35.0	
	ND	2.0	3.6	7.3	13.8	20.2	24.0	N/A	
Rated Output Current (A)	HD	0.8	1.6	3	5	8	11	17.6	
	ND	1.2	1.9	3.5	6	9.6	12.2	N/A	
Carrier Frequency	HD	10 kHz					8kHz		
	ND	2 kHz							
Maximum Output Voltage	Three-phase 200~240V (proportional to input voltage)								
EMC Filter	Built in (IEC61800-3 Category 1, 10 m shielded motor cable), version without filter available						External		
AC Power Supply	Voltage: Three-phase AC power supply: 200~240V -15/+10% Frequency: 50/60Hz +/- 5%								
DC Power Supply	270 to 340 Vdc								

Three-phase 400 V Units

CIPR-GA50A4□□□□		0001	0002	0004	0005	0007	0009	0012	0018	0023	0031	0038	0044	0060
Maximum Applicable Motor Capacity (kW)	HD	0.37	0.55	0.75/ 1.1	1.5	2.2	3.0	4.0	5.5	7.5	11.0	15.0	18.5	22.0
	ND	0.37	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11.0	15.0	18.5	22.0	30.0
Input Current (A)	HD	1.2	1.8	3.2	4.4	6.0	8.2	10.4	15	20	29	39	51	60
	ND	1.2	2.1	4.3	5.9	8.1	9.4	14	20	24	38	44	60	81
Rated Output Current (A)	HD	1.2	1.8	3.4	4.8	5.6	7.3	9.2	14.8	18.0	24.0	31.0	39.0	45.0
	ND	1.2	2.1	4.1	5.4	7.1	8.9	11.9	17.5	23.4	31.0	38.0	44.0	60
Carrier Frequency	HD							8kHz						
	ND							2kHz						
Maximum Output Voltage	3-phase, 380 to 480V, 50/60Hz													
EMC Filter	Built in (IEC61800-3 Category 2, 20 m shielded motor cable), version without filter available													
AC Power Supply	Voltage: Three-phase AC power supply: 380~480V -15/+10% Frequency: 50/60Hz +/- 5%													
DC Power Supply	513 to 679 Vdc													

Watt Loss

Units without EMC filter

Model	Heavy Duty									Normal Duty				
	Irated	fc	Heat Loss			fc	Heat Loss			Irated	fc	Heat Loss		
			inside	backside	total		inside	backside	total			inside	backside	total
A	kHz	W	W	W	kHz	W	W	W	A	kHz	W	W	W	
GA50CB001Axx	0.8	2	7	4	11	10	8	5	13	1.2	2	8	6	14
GA50CB002Axx	1.6	2	10	7	17	10	10	9	19	1.9	2	14	11	25
GA50CB004Axx	3	2	13	13	26	10	14	16	30	3.5	2	14	17	31
GA50CB006Axx	5	2	17	23	40	10	18	28	46	6	2	17	26	43
GA50CB010Axx	8	2	30	37	67	8	31	42	73	9.6	2	36	50	86
GA50CB012Axx	11	2	40	48	88	8	41	55	96	12.2	2	48	60	108
GA50CB018Axx	17.6	2	49	72	121	8	53	98	151					
GA50C2001Axx	0.8	2	6	4	10	10	6	5	11	1.2	2	7	5	12
GA50C2002Axx	1.6	2	7	7	14	10	7	8	15	1.9	2	9	9	18
GA50C2004Axx	3	2	9	13	22	10	10	16	26	3.5	2	11	16	27
GA50C2006Axx	5	2	13	22	35	10	14	27	41	6	2	14	25	39
GA50C2008Axx	6.9	2	14	30	44	8	15	35	50	8	2	18	37	55
GA50C2010Axx	8	2	17	37	54	8	18	43	61	9.6	2	25	51	76
GA50C2012Axx	11	2	23	49	72	8	24	56	80	12.2	2	30	61	91
GA50C2018Axx	14	2	26	61	87	8	30	82	112	17.5	2	35	82	117
GA50C2021Axx	17.6	2	36	83	119	8	40	108	148	21	2	52	111	163
GA50C2030Axx	25	2	45	163	208	8	49	187	236	30	2	63	240	303
GA50C2042Axx	33	2	55	200	255	8	60	232	292	42	2	84	307	391
GA50C2056Axx	47	2	77	269	346	8	85	318	403	56	2	109	367	476
GA50C2070Axx	60	2	108	411	519	8	119	473	592	70	2	142	534	676
GA50C2082Axx	75	2	132	439	571	8	148	525	673	82	2	160	531	691
GA50C4001Axx	1.2	2	8	7	15	8	9	11	20	1.2	2	8	7	15
GA50C4002Axx	1.8	2	10	10	20	8	11	16	27	2.1	2	13	12	25
GA50C4004Axx	3.4	2	13	21	34	8	15	31	46	4.1	2	14	24	38
GA50C4005Axx	4.8	2	15	29	44	8	18	42	60	5.4	2	16	32	48
GA50C4007Axx	5.6	2	16	33	49	8	18	49	67	7.1	2	20	44	64
GA50C4009Axx	7.3	2	21	45	66	8	25	65	90	8.9	2	28	58	86
GA50C4012Axx	9.2	2	27	60	87	8	32	85	117	11.9	2	39	83	122
GA50C4018Axx	14.8	2	48	126	174	8	55	166	221	17.5	2	52	155	207
GA50C4023Axx	18	2	53	152	205	8	61	200	261	23.4	2	86	236	322
GA50C4031Axx	24	2	68	191	259	8	79	255	334	31	2	101	284	385
GA50C4038Axx	31	2	81	256	337	8	95	338	433	38	2	108	341	449
GA50C4044Axx	39	2	109	338	447	8	127	442	569	44	2	137	417	554
GA50C4060Axx	45	2	114	328	442	8	135	446	581	60	2	176	490	666

Units with integrated EMC filter

Model	Heavy Duty									Normal Duty				
	Irated	fc	Heat Loss			fc	Heat Loss			Irated	fc	Heat Loss		
			inside	backside	total		inside	backside	total			inside	backside	total
A	kHz	W	W	W	kHz	W	W	W	A	kHz	W	W	W	
GA50CB001Exx	0.8	2	8	4	12	10	9	5	14	1.2	2	9	6	15
GA50CB002Exx	1.6	2	12	7	19	10	12	9	21	1.9	2	18	11	29
GA50CB004Exx	3	2	17	13	30	10	18	16	34	3.5	2	19	17	36
GA50CB006Exx	5	2	20	23	43	10	21	28	49	6	2	20	26	46
GA50CB010Exx	8	2	34	37	71	8	35	42	77	9.6	2	44	50	94
GA50CB012Exx	11	2	45	48	93	8	46	55	101	12.2	2	56	60	116
GA50CB018Exx	17.6	2	50	72	122	8	54	98	152					
GA50C2001Exx	0.8	2	7	4	11	10	7	5	12	1.2	2	8	5	13
GA50C2002Exx	1.6	2	8	7	15	10	8	8	16	1.9	2	12	9	21
GA50C2004Exx	3	2	12	13	25	10	13	16	29	3.5	2	15	16	31
GA50C2006Exx	5	2	20	22	42	10	21	27	48	6	2	21	25	46
GA50C2008Exx	6.9	2	15	30	45	8	16	35	51	8	2	19	37	56
GA50C2010Exx	8	2	18	37	55	8	19	43	62	9.6	2	26	51	77
GA50C2012Exx	11	2	24	49	73	8	25	56	81	12.2	2	31	61	92
GA50C2018Exx	14	2	27	61	88	8	31	82	113	17.5	2	36	82	118
GA50C2021Exx	17.6	2	37	83	120	8	41	108	149	21	2	53	111	164
GA50C2030Exx	25	2	46	163	209	8	50	187	237	30	2	64	240	304
GA50C2042Exx	33	2	56	200	256	8	61	232	293	42	2	85	307	392
GA50C2056Exx	47	2	78	269	347	8	86	318	404	56	2	110	367	477
GA50C2070Exx	60	2	109	411	520	8	120	473	593	70	2	143	534	677
GA50C2082Exx	75	2	133	439	572	8	149	525	674	82	2	161	531	692
GA50C4001Exx	1.2	2	9	7	16	8	10	11	21	1.2	2	9	7	16
GA50C4002Exx	1.8	2	11	10	21	8	12	16	28	2.1	2	14	12	26
GA50C4004Exx	3.4	2	15	21	36	8	17	31	48	4.1	2	16	24	40
GA50C4005Exx	4.8	2	17	29	46	8	20	42	62	5.4	2	18	32	50
GA50C4007Exx	5.6	2	18	33	51	8	20	49	69	7.1	2	23	44	67
GA50C4009Exx	7.3	2	24	45	69	8	28	65	93	8.9	2	33	58	91
GA50C4012Exx	9.2	2	29	60	89	8	34	85	119	11.9	2	41	83	124
GA50C4018Exx	14.8	2	52	126	178	8	59	166	225	17.5	2	56	155	211
GA50C4023Exx	18	2	57	152	209	8	65	200	265	23.4	2	94	236	330
GA50C4031Exx	24	2	73	191	264	8	84	255	339	31	2	109	284	393
GA50C4038Exx	31	2	89	256	345	8	103	338	441	38	2	119	341	460
GA50C4044Exx	39	2	119	338	457	8	137	442	579	44	2	151	417	568
GA50C4060Exx	45	2	128	328	456	8	149	446	595	60	2	200	490	690

Deratings

Carrier Frequency Derating

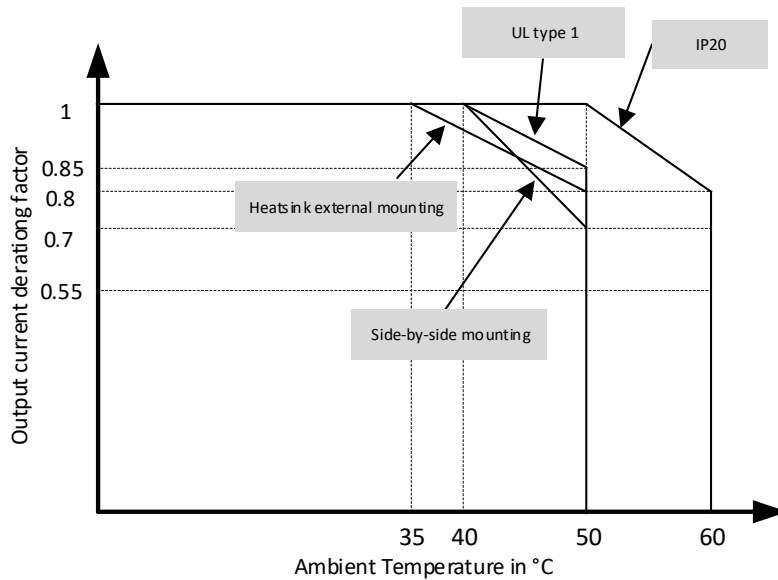
The rated current of GA500 drives might need to be reduced depending on the selected carrier frequency. Relations between HD/ND setting, carrier frequency and rated output current are shown below.

Model GA50C...	Drive Rated Output Current in Ampere											
	Heavy Duty (C6-01=0)						Normal Duty (C6-01=1)					
	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz	15 kHz	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz	15 kHz
B001	0.8	0.8	0.8	0.8	0.7	0.6	1.2	1.1	1.0	0.9	0.8	0.6
B002	1.6	1.6	1.6	1.6	1.4	1.3	1.9	1.9	1.7	1.6	1.4	1.3
B004	3.0	3.0	3.0	3.0	2.7	2.4	3.5	3.5	3.2	3.0	2.7	2.4
B006	5.0	5.0	5.0	5.0	4.5	4.0	6.0	6.0	5.4	5.0	4.5	4.0
B010	8.0	8.0	8.0	7.5	7.0	6.4	9.6	9.1	8.3	7.7	7.1	6.4
B012	11.0	11.0	11.0	10.4	9.6	8.8	12.2	11.9	11.0	10.4	9.6	8.8
B018	17.6	17.6	17.6	16.6	15.3	14.1	21.0	19.8	18.1	17.0	15.5	14.1
2001	0.8	0.8	0.8	0.8	0.7	0.6	1.2	1.1	1.0	0.9	0.8	0.6
2002	1.6	1.6	1.6	1.6	1.4	1.3	1.9	1.9	1.7	1.6	1.4	1.3
2004	3.0	3.0	3.0	3.0	2.7	2.4	3.5	3.5	3.2	3.0	2.7	2.4
2006	5.0	5.0	5.0	5.0	4.5	4	6.0	6.0	5.4	5.0	4.5	4
2010	8.0	8.0	8.0	7.5	7.0	6.4	9.6	9.1	8.3	7.7	7.1	6.4
2012	11.0	11.0	11.0	10.4	9.6	8.8	12.2	11.9	11.0	10.4	9.6	8.8
2021	17.6	17.6	17.6	16.6	15.3	14.1	21.0	19.8	18.1	17.0	15.5	14.1
2030	25.0	25.0	25.0	23.6	21.8	20	30.0	28.3	25.8	24.2	22.1	20
2042	33.0	33.0	33.0	31.1	28.8	26	42.0	39.4	35.5	32.9	29.7	26
2056	47.0	47.0	47.0	44.3	41.0	38	56.0	52.9	48.3	45.3	41.4	38
2070	60.0	60.0	60.0	56.6	52.3	48	70.0	66.3	60.8	57.2	52.6	48
2082	75.0	75.0	75.0	70.7	65.4	60	82.0	81.4	75.0	70.7	65.4	60
4001	1.2	1.2	1.2	1.1	0.9	0.7	1.2	1.2	1.2	1.1	0.9	0.7
4002	1.8	1.8	1.8	1.6	1.3	1.1	2.1	2.1	1.8	1.6	1.3	1.1
4004	3.4	3.4	3.4	3.0	2.5	2.0	4.1	4.0	3.4	3.0	2.5	2.0
4005	4.8	4.8	4.8	4.3	3.6	2.9	5.4	5.4	4.8	4.2	3.6	2.9
4007	5.5	5.5	5.5	4.9	4.1	3.3	7.1	6.5	5.5	4.9	4.1	3.3
4009	7.3	7.3	7.3	6.5	5.4	4.4	8.9	8.6	7.3	6.5	5.4	4.4
4012	9.2	9.2	9.2	8.1	6.8	5.5	11.9	10.8	9.2	8.2	6.8	5.5
4018	14.8	14.8	14.8	13.1	11.0	8.9	17.8	17.3	14.7	13.1	11.0	8.8
4023	18.0	18.0	18.0	13.1	11.0	11	23.4	21.3	18.2	16.1	13.4	11
4031	24.0	24.0	24.0	21.3	17.8	14	31.0	28.2	24.1	21.3	17.9	14
4038	31.0	31.0	31.0	27.5	23.0	19	38.0	36.3	31.0	27.5	23.0	19
4044	39.0	39.0	39.0	34.5	29.0	23	44.0	44.0	39.0	34.5	29.0	23
4060	45.0	45.0	45.0	39.9	33.4	27	60.0	54.5	46.3	40.8	33.9	27

1. Applicable Motor Control Methods: V/f Control, Open Loop Vector, PM Open Loop Vector, EZ Vector Control
2. Refer to the GA500 Technical Manual for Carrier Frequency Derating information in control mode AOLV/PM.

Ambient Temperature Derating

Depending on the mounting condition, enclosure type and ambient temperature derating factors need to be applied on the rated output current of GA500 drives. The derating curves shown below are valid for all frames of GA500.



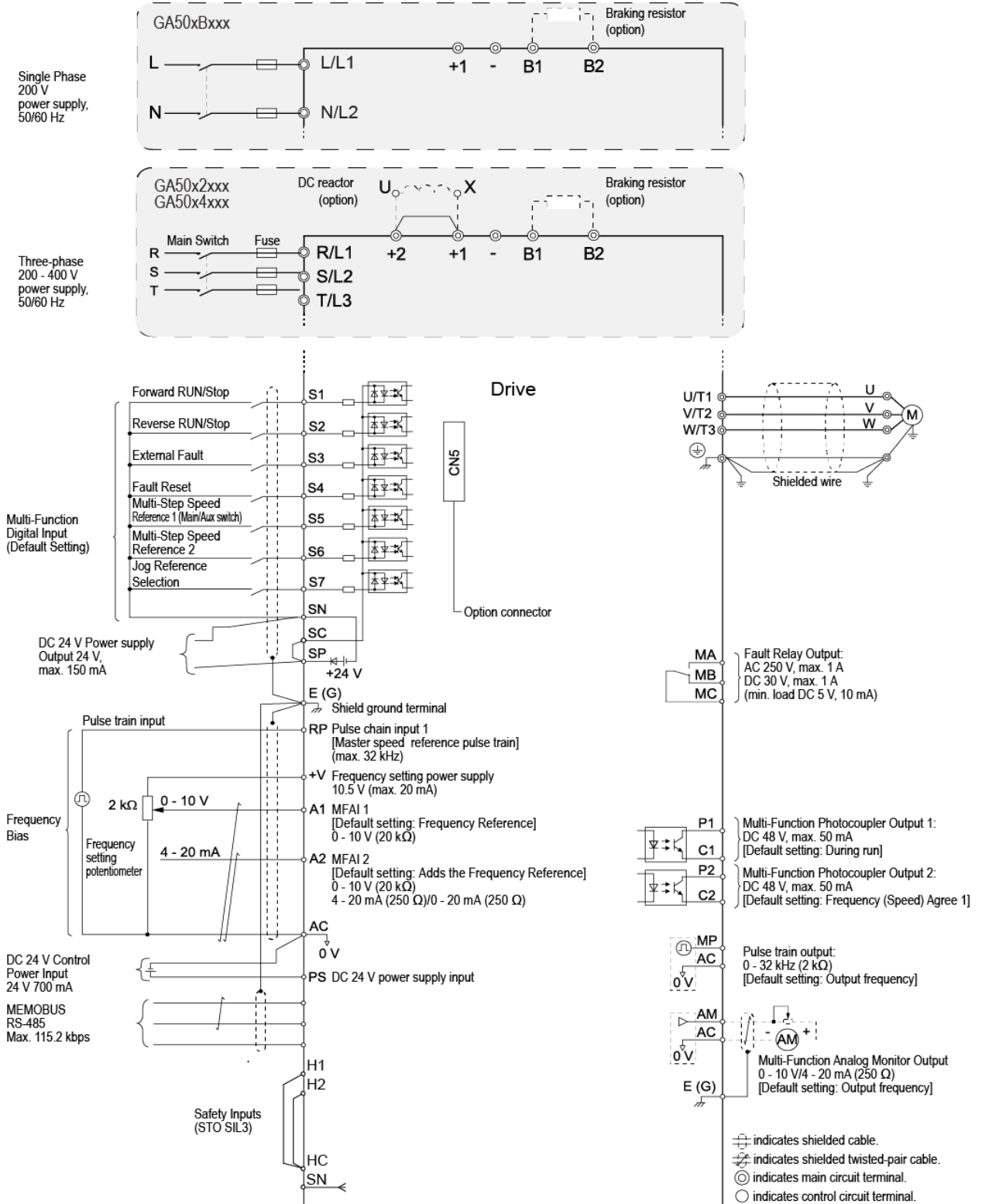
Altitude Derating

GA500 drives can be operated at altitudes up to 1000 m without derating. Between 1000 and 4000 m altitude above sea level a derating of 1 % per 100 m must be applied to the rated output current.

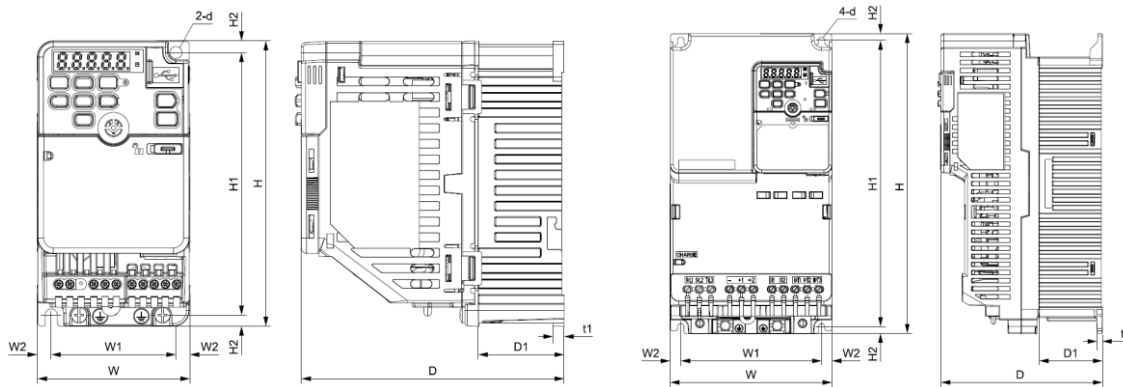
Additionally, a derating must be applied to the rated voltage if the drive is installed over 2000 m above sea level with the neutral point of the power supply ungrounded.

Electrical Connections

Connection Diagram



Dimensions



Voltage Class	Power (HD) [kW]	Model	Dimensions [mm] / Weight [kg]											
			W	H	D (without EMC Fit)	D (with integr. EMC Fit)	D1	W1	W2	H1	H2	t1	d	Weight without/with EMC filter
1x230V	0.1	GA50xB001	68	128	76	116	6.5	56	6	118	5	3	For M5	0.5 / 0.7
1x230V	0.2	GA50xB002	68	128	76	116	6.5	56	6	118	5	3	For M5	0.5 / 0.7
1x230V	0.4	GA50xB004	68	128	118	158	38.5	56	6	118	5	5	For M5	0.8 / 1
1x230V	0.75	GA50xB006	108	128	137.5	182.5	56.5	96	6	118	5	5	For M5	1.5 / 1.8
1x230V	1.5	GA50xB010	108	128	154	199	56.5	96	6	118	5	5	For M5	1.5 / 1.8
1x230V	2.2	GA50xB012	140	128	163	203	65	128	6	118	5	5	For M5	2.1 / 2.7
1x230V	4	GA50xB018	170	128	180	-	65	158	6	118	5	5	For M5	2.9 / -
3x230V	0.1	GA50x2001	68	128	76	116	6.5	56	6	118	5	3	For M5	0.5 / 0.6
3x230V	0.2	GA50x2002	68	128	76	116	6.5	56	6	118	5	3	For M5	0.5 / 0.6
3x230V	0.4	GA50x2004	68	128	108	148	38.5	56	6	118	5	5	For M5	0.8 / 0.9
3x230V	0.75	GA50x2006	68	128	128	168	58.5	56	6	118	5	5	For M5	0.9 / 1.1
3x230V	1.1	GA50x2008	108	128	129	174	56.5	96	6	118	5	5	For M5	1.5 / 1.6
3x230V	1.5	GA50x2010	108	128	129	174	56.5	96	6	118	5	5	For M5	1.5 / 1.6
3x230V	2.2	GA50x2012	108	128	137.5	182.5	56.5	96	6	118	5	5	For M5	1.5 / 1.6
3x230V	3	GA50x2018	140	128	143	193	65	128	6	118	5	5	For M5	2 / 2.4
3x230V	4	GA50x2021	140	128	143	193	65	128	6	118	5	5	For M5	2 / 2.4
3x230V	5.5	GA50x2030	140	260	140	196	55	122	9	248	6	5	For M5	3.4 / 3.9
3x230V	7.5	GA50x2042	140	260	140	196	55	122	9	248	6	5	For M5	3.6 / 4.1
3x230V	11	GA50x2056	180	300	143	196	55	160	10	284	8	5	For M5	5.5 / 6
3x230V	15	GA50x2070	220	350	187	216	78	192	14	336	7	5	For M6	7.5 / 8.5
3x230V	18.5	GA50x2082	220	350	187	216	78	192	14	336	7	5	For M6	8 / 9
3x400V	0.2	GA50x4001	108	128	81	126	8.5	96	6	118	5	5	For M5	0.8 / 1.4
3x400V	0.4	GA50x4002	108	128	99	144	26.5	96	6	118	5	5	For M5	0.9 / 1.5
3x400V	0.75	GA50x4004	108	128	137.5	182.5	56.5	96	6	118	5	5	For M5	1.5 / 1.9
3x400V	1.5	GA50x4005	108	128	154	199	56.5	96	6	118	5	5	For M5	1.5 / 1.9
3x400V	2.2	GA50x4007	108	128	154	199	56.5	96	6	118	5	5	For M5	1.5 / 1.9
3x400V	3	GA50x4009	108	128	154	199	56.5	96	6	118	5	5	For M5	1.5 / 1.9
3x400V	4	GA50x4012	140	128	143	193	65	128	6	118	5	5	For M5	2 / 2.6
3x400V	5.5	GA50x4018	140	260	140	196	55	122	9	248	6	5	For M5	3 / 3.9
3x400V	7.5	GA50x4023	140	260	140	196	55	122	9	248	6	5	For M5	3.2 / 3.9
3x400V	11	GA50x4031	180	300	143	196	55	160	10	284	8	5	For M5	4.6 / 5.5
3x400V	15	GA50x4038	180	300	143	196	55	160	10	284	8	5	For M5	4.8 / 5.5
3x400V	18.5	GA50x4044	190	350	204	251	94	160	15	336	7	5	For M6	6.5 / 8
3x400V	22	GA50x4060	190	350	204	251	94	160	15	336	7	5	For M6	6.5 / 8.5

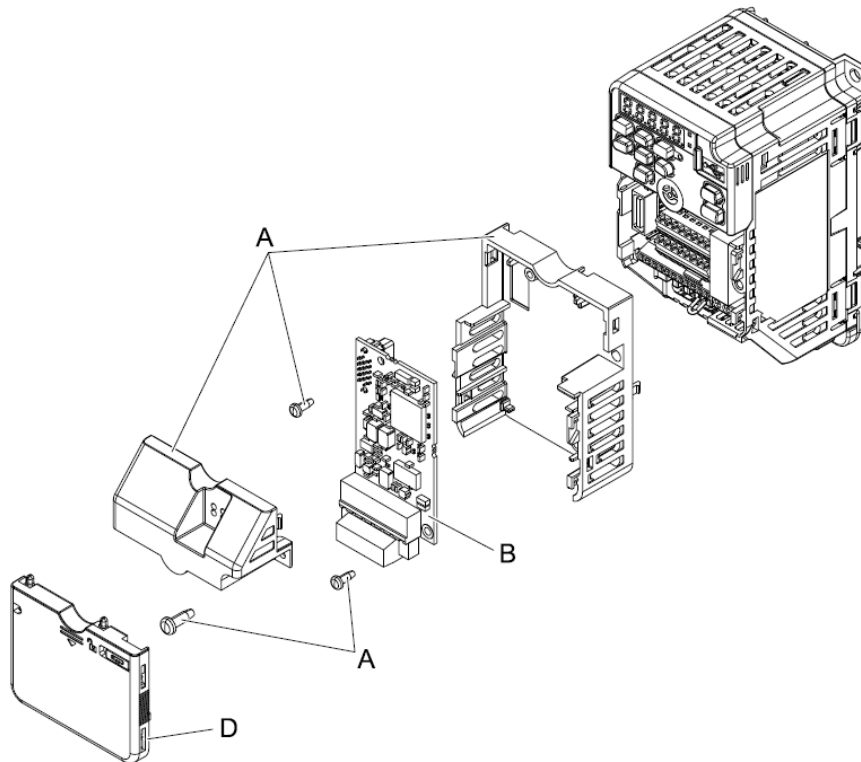
Accessories

Network Communications Option Cards

The communication option cards listed below can be mounted on GA500 drive. They are shipped loose together with the required installation material. An option enclosure which is to be **ordered separately** is required to install one of these option cards on a GA500 drive.

Network Type	Option Card Model Codes
CANopen	SI-S3
Profibus	SI-P3
EtherCat	SI-ES3
EtherNet IP	SI-EN3 (single port) / SI-EN3/D (dual port)
Modbus TCP	SI-EM3 (single port) / SI-EM3/D (dual port)
ProfiNet	SI-EP3
PowerLink	SI-EL3
CC-Link	SI-C3
Option Card Enclosure	JOHB-GA50

Option enclosure (Model code: JOHB-GA50, parts A) and option card installation:



- A - Option card mounting kit components
- B - Communication options
- C - Front cover
- D - Option card enclosure

LED/LCD keypads

LED Full Size Keypad (Model Code: JVOP-KPLEA04AAA)

This optional LED keypad provides a larger LED display (5 digit, 7 segments) and larger navigation buttons for more comfort during drive operation.

LCD Keypad (Model Code: JVOP-KPLCA04AEA)

This optional LCD keypad greatly improves the operability of the drive. The high-res screen can display graphics and multi-language full text. Additional functions are: Start-up Wizard, copy function (4 sets of parameters), backup, data logging, real-time clock.

LCD Bluetooth Keypad (Model Code: JVOP-KPLCC04ABA)

This optional LCD keypad provides the ability to connect to the drive using Bluetooth. It is designed to be able to operate like the LCD keypad if keypad navigation is required.

This keypad is used in conjunction with DriveWizard Mobile to connect to the drive via Bluetooth. You can download DriveWizard Mobile to your mobile device through the Apple AppStore or Google Play.



Extension Cables

Extension cables for keypads are offered in two lengths.

Model Number	Description
WV001-YEG	Keypad Remote Mount Cable - 1 Meter
WV003-YEG	Keypad Remote Mount Cable - 3 Meter

Keypad door mounting kit

Door Mounting Kit for GA500 Internal Keypad

The part number and description for this option will be added later.

Door Mounting Kits for LCD Keypads (with or without Bluetooth)

The LCD keypads can be mounted in to a panel front door using one of the mounting kits below.

Type of Mounting	Brackets have tapped holes for use with screws	brackets have untapped holes for use with panel studs
Model Code	900-192-933-001	900-192-933-002



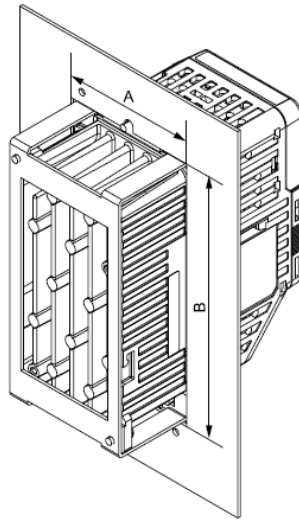
Heatsink External Mounting Kit

GA500 drives with IP20 or UL Open Type 1 can be mounted with the heatsink out the back of the panel or enclosure in order to have the main source of heat loss outside and so reduce panel volume or panel cooling. A rectangular cut out is required in the panel. Drives are fixed using an heatsink external mounting kit.

Details on assembly and installation can be found in the Installation Manual for these kits (TOEPC72060009_).

- Important:**
- With this method of mounting the rated output current might require a derating. See section “Deratings” in this document.
 - The backside of the drive remains IP20. The externally mounted heatsink should not be exposed to dusty or wet environment that would normally require a higher degree of ingress protection.

Appearance



Heatsink External Mounting Kit Model Numbers

Voltage Class	Power kW (HD)	GA500 Model	Heatsink External Mounting Kit	Voltage Class	Power kW (HD)	GA500 Model	Heatsink External Mounting Kit
1x230V	0.1	GA50xB001xxx	ZPSA-GA50V1-1	3x230V	0.1	GA50x2001xxx	ZPSA-GA50V1-1
1x230V	0.2	GA50xB002xxx	ZPSA-GA50V1-1	3x230V	0.2	GA50x2002xxx	ZPSA-GA50V1-1
1x230V	0.4	GA50xB004xxx	ZPSA-GA50V1-2	3x230V	0.4	GA50x2004xxx	ZPSA-GA50V1-2
1x230V	0.75	GA50xB006xxx	ZPSA-GA50V2-2	3x230V	0.75	GA50x2006xxx	ZPSA-GA50V1-3
1x230V	1.5	GA50xB010xxx	ZPSA-GA50V2-3	3x230V	1.1	GA50x2008xxx	ZPSA-GA50V2-3
1x230V	2.2	GA50xB012xxx	ZPSA-GA50V3-1	3x230V	1.5	GA50x2010xxx	ZPSA-GA50V2-3
1x230V	4	GA50xB018xxx	ZPSA-GA50V4-1	3x230V	2.2	GA50x2012xxx	ZPSA-GA50V2-3
3x400V	0.2	GA50x4001xxx	ZPSA-GA50V2-1	3x230V	3	GA50x2018xxx	ZPSA-GA50V3-1
3x400V	0.4	GA50x4002xxx	ZPSA-GA50V2-2	3x230V	4	GA50x2021xxx	ZPSA-GA50V3-1
3x400V	0.75	GA50x4004xxx	ZPSA-GA50V2-2	3x230V	5.5	GA50x2030xxx	ZPSA-GA50V5-1
3x400V	1.5	GA50x4005xxx	ZPSA-GA50V2-3	3x230V	7.5	GA50x2042xxx	ZPSA-GA50V5-1
3x400V	2.2	GA50x4007xxx	ZPSA-GA50V2-3	3x230V	11	GA50x2056xxx	ZPSA-GA50V6-1
3x400V	3	GA50x4009xxx	ZPSA-GA50V2-3	3x230V	15	GA50x2070xxx	ZPSA-GA50V7-1
3x400V	4	GA50x4012xxx	ZPSA-GA50V3-1	3x230V	18.5	GA50x2082xxx	ZPSA-GA50V7-1
3x400V	5.5	GA50x4018xxx	ZPSA-GA50V5-1				
3x400V	7.5	GA50x4023xxx	ZPSA-GA50V5-1				
3x400V	11	GA50x4031xxx	ZPSA-GA50V6-1				
3x400V	15	GA50x4038xxx	ZPSA-GA50V6-1				
3x400V	18.5	GA50x4044xxx	ZPSA-GA50V8-1				
3x400V	22	GA50x4058xxx	ZPSA-GA50V8-1				

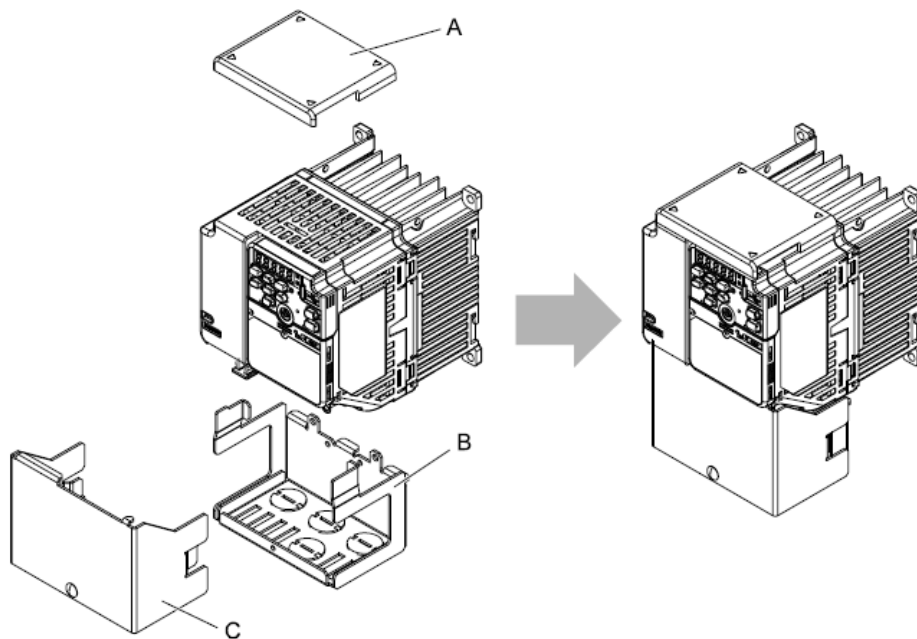
UL Type 1 Kit

UL Type 1 kits consist of a top cover, a cable connection box, and a face plate that can be mounted on standard GA500 drives with IP20 in order to make them UL Type 1 compliant.

Details on assembly and installation can be found the Installation Manual for these kits (TOEPC72060008_).

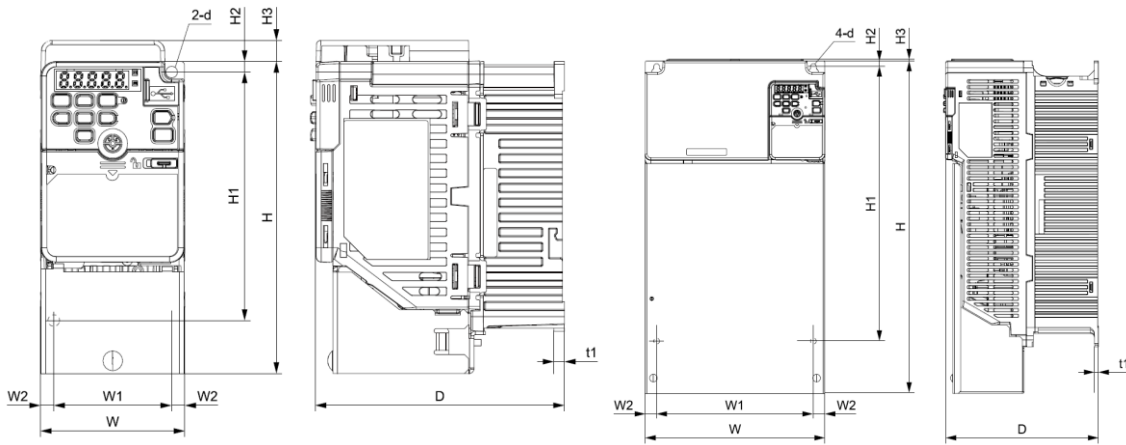
- Important:**
- UL Type 1 kits can only be mounted on GA500 drives without embedded EMC filter.
 - With a UL Type 1 kit installed the output current might require a derating. See section “Deratings” in this document.

Appearance



A – Top Cover, B – Base, C – Front cover

UL Type 1 Kit Model Numbers, Dimensions and Weight

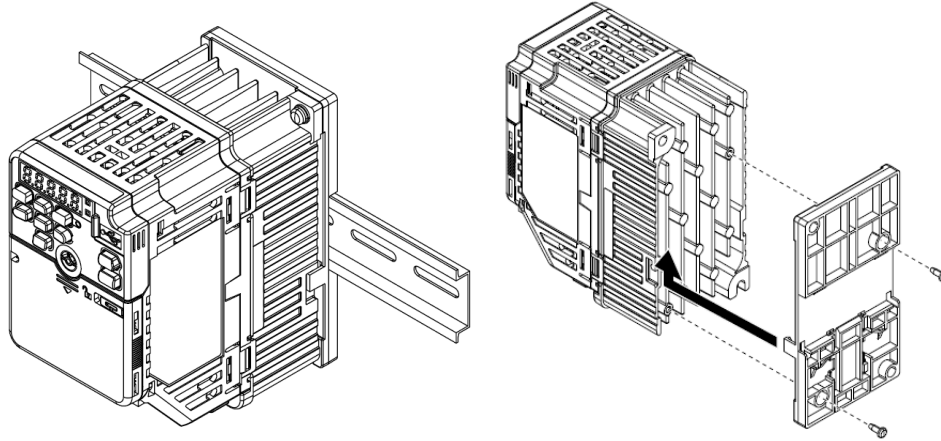


Voltage Class	Power kW (HD)	GA500 Model	UL Type 1 Kit	Dimensions / Weight (Drive with UL Type 1 Kit)										
				W	H	D	W1	W2	H1	H2	H3	t1	d	Weight [kg]
1x230V	0.1	GA50xB001ABx	ZBAA-GA50V1-1	68	148	76	56	6	118	5	10	3	For M5	1
1x230V	0.2	GA50xB002ABx	ZBAA-GA50V1-1	68	148	76	56	6	118	5	10	3	For M5	1
1x230V	0.4	GA50xB004ABx	ZBAA-GA50V1-2	68	148	118	56	6	118	5	10	5	For M5	1
1x230V	0.75	GA50xB006ABx	ZBAA-GA50V2-1	108	178	138	96	6	118	5	10	5	For M5	2
1x230V	1.5	GA50xB010ABx	ZBAA-GA50V2-2	108	178	154	96	6	118	5	10	5	For M5	2
1x230V	2.2	GA50xB012ABx	ZBAA-GA50V3-1	140	178	163	128	6	118	5	10	5	For M5	3
1x230V	4	GA50xB018ABx	ZBAA-GA50V4-1	170	182	180	158	6	118	5	2	5	For M5	3
3x230V	0.1	GA50x2001ABx	ZBAA-GA50V1-1	68	148	76	56	6	118	5	10	3	For M5	1
3x230V	0.2	GA50x2002ABx	ZBAA-GA50V1-1	68	148	76	56	6	118	5	10	3	For M5	1
3x230V	0.4	GA50x2004ABx	ZBAA-GA50V1-1	68	148	108	56	6	118	5	10	5	For M5	1
3x230V	0.75	GA50x2006ABx	ZBAA-GA50V1-1	68	148	128	56	6	118	5	10	5	For M5	1
3x230V	1.1	GA50x2008ABx	ZBAA-GA50V2-3	108	178	129	96	6	118	5	10	5	For M5	2
3x230V	1.5	GA50x2010ABx	ZBAA-GA50V2-3	108	178	129	96	6	118	5	10	5	For M5	2
3x230V	2.2	GA50x2012ABx	ZBAA-GA50V2-1	108	178	138	96	6	118	5	10	5	For M5	2
3x230V	3	GA50x2018ABx	ZBAA-GA50V3-2	140	178	143	128	6	118	5	10	5	For M5	2
3x230V	4	GA50x2021ABx	ZBAA-GA50V3-2	140	178	143	128	6	118	5	10	5	For M5	2
3x230V	5.5	GA50x2030ABx	ZBAA-GA50V5-1	140	298	140	122	9	248	6	2	5	For M5	4
3x230V	7.5	GA50x2042ABx	ZBAA-GA50V5-1	140	298	140	122	9	248	6	2	5	For M5	4
3x230V	11	GA50x2056ABx	ZBAA-GA50V6-1	180	340	143	160	10	284	8	2	5	For M5	6
3x230V	15	GA50x2070ABx	ZBAA-GA50V7-1	220	403	187	192	14	336	7	2	5	For M6	9
3x230V	18.5	GA50x2082ABx	ZBAA-GA50V7-1	220	403	187	192	14	336	7	2	5	For M6	9
3x400V	0.2	GA50x4001ABx	ZBAA-GA50V2-4	108	149	81	96	6	118	5	10	5	For M5	1
3x400V	0.4	GA50x4002ABx	ZBAA-GA50V2-4	108	149	99	96	6	118	5	10	5	For M5	1
3x400V	0.75	GA50x4004ABx	ZBAA-GA50V2-5	108	149	138	96	6	118	5	10	5	For M5	2
3x400V	1.5	GA50x4005ABx	ZBAA-GA50V2-2	108	178	154	96	6	118	5	10	5	For M5	2
3x400V	2.2	GA50x4007ABx	ZBAA-GA50V2-2	108	178	154	96	6	118	5	10	5	For M5	2
3x400V	3	GA50x4009ABx	ZBAA-GA50V2-2	108	178	154	96	6	118	5	10	5	For M5	2
3x400V	4	GA50x4012ABx	ZBAA-GA50V3-2	140	178	143	128	6	118	5	10	5	For M5	2
3x400V	5.5	GA50x4018ABx	ZBAA-GA50V5-1	140	298	140	122	9	248	6	2	5	For M5	4
3x400V	7.5	GA50x4023ABx	ZBAA-GA50V5-1	140	298	140	122	9	248	6	2	5	For M5	4
3x400V	11	GA50x4031ABx	ZBAA-GA50V6-1	180	340	143	160	10	284	8	2	5	For M5	5
3x400V	15	GA50x4038ABx	ZBAA-GA50V6-1	180	340	143	160	10	284	8	2	5	For M5	6
3x400V	18.5	GA50x4044ABx	ZBAA-GA50V8-1	190	403	204	160	15	336	7	2	5	For M6	8
3x400V	22	GA50x4058ABx	ZBAA-GA50V8-1	190	403	204	160	15	336	7	2	5	For M6	8

DIN Rail Attachment

GA500 drives up to 4 kW can be mounted on a DIN rail using a DIN rail attachment. Details on assembly and installation can be found the Installation Manual for these attachments (TOEPC72060004_).

Appearance



DIN Rail Attachment Model Numbers



Voltage Class	Power kW (HD)	GA500 Model	DIN Rail Attachment
1x230V	0.1	GA50xB001ABx	ZPZ-GA50V1
1x230V	0.2	GA50xB002ABx	ZPZ-GA50V1
1x230V	0.4	GA50xB004ABx	ZPZ-GA50V1
1x230V	0.75	GA50xB006ABx	ZPZ-GA50V2
1x230V	1.5	GA50xB010ABx	ZPZ-GA50V2
1x230V	2.2	GA50xB012ABx	ZPZ-GA50V3
1x230V	4	GA50xB018ABx	EZZ08122D
3x230V	0.1	GA50x2001ABx	ZPZ-GA50V1
3x230V	0.2	GA50x2002ABx	ZPZ-GA50V1
3x230V	0.4	GA50x2004ABx	ZPZ-GA50V1
3x230V	0.75	GA50x2006ABx	ZPZ-GA50V1
3x230V	1.1	GA50x2008ABx	ZPZ-GA50V2
3x230V	1.5	GA50x2010ABx	ZPZ-GA50V2
3x230V	2.2	GA50x2012ABx	ZPZ-GA50V2
3x230V	3	GA50x2018ABx	ZPZ-GA50V3
3x230V	4	GA50x2021ABx	ZPZ-GA50V3
3x400V	0.2	GA50x4001ABx	ZPZ-GA50V2
3x400V	0.4	GA50x4002ABx	ZPZ-GA50V2
3x400V	0.75	GA50x4004ABx	ZPZ-GA50V2
3x400V	1.5	GA50x4005ABx	ZPZ-GA50V2
3x400V	2.2	GA50x4007ABx	ZPZ-GA50V2
3x400V	3	GA50x4009ABx	ZPZ-GA50V2
3x400V	4	GA50x4012ABx	ZPZ-GA50V3

Cable Shield Clamp Kit

The part number and description for this option will be added later.

Tools and Software

Tools

Tool	Description	System	Connection
DriveWizard 10	PC Tool for parameter management/backup/diagnostics	Windows	USB-mini
DriveWorksEZ 10	Customization tool with drag-n-drop icon-based programming	Windows	USB-mini
DriveWizard Mobile	Mobile app for parameter management/backup/diagnostics	Android 	<ul style="list-style-type: none"> • Bluetooth • USB-mini with USB on-the-go adapter
		iPhone 	<ul style="list-style-type: none"> • Bluetooth

Connection Cables

Model Number	Description
JZSP-CVS06-02-E	USB-mini connection cable for PC 2.5m

Power Options

AC Input Reactors

Input reactors can be applied in order to reduce harmonic distortion on the AC input line. Reactors are offered with 2% or 4% uk. IP20 covers are separately available.

GA500 Model	4 % uk		2 % uk	
	IP00	IP20 cover	IP00	IP20 cover
GA50CB001xxx	n.a	n.a	n.a	n.a
GA50CB002xxx				
GA50CB004xxx				
GA50CB006xxx				
GA50CB010xxx				
GA50CB012xxx				
GA50CB018xxx				
GA50C2001xxx	LR3 40-4/4		ALR3 40-2/2	IP20-Box31
GA50C2002xxx			ALR3 40-2/4	
GA50C2004xxx	LR3 40-4/6	IP20-Box32	ALR3 40-2/10	
GA50C2006xxx				
GA50C2008xxx	LR3 40-4/10		ALR3 40-2/16	IP20-Box32
GA50C2010xxx				
GA50C2012xxx	LR3 40-4/25	IP20-Box33	ALR3 40-2/25	
GA50C2018xxx				
GA50C2021xxx	LR3 40-4/45	IP20-Box35	ALR3 40-2/45	
GA50C2030xxx				
GA50C2042xxx	LR3 40-4/63	IP20-Box36	ALR3 40-2/63	IP20-Box35
GA50C2056xxx				
GA50C2070xxx	LR3 40-4/90	IP20-Box39	n.a.	
GA50C2082xxx	LR3 40-4/115	IP20-Box41		
GA50C4001xxx	LR3 40-4/4		ALR3 40-2/2	
GA50C4002xxx				
GA50C4004xxx	LR3 40-4/6	IP20-Box32	ALR3 40-2/4	IP20-Box31
GA50C4005xxx				
GA50C4007xxx	LR3 40-4/10		ALR3 40-2/6	
GA50C4009xxx				
GA50C4012xxx	LR3 40-4/16		ALR3 40-2/10	
GA50C4018xxx				
GA50C4023xxx	LR3 40-4/25	IP20-Box33	ALR3 40-2/16	IP20-Box32
GA50C4031xxx				
GA50C4038xxx	LR3 40-4/45	IP20-Box35	ALR3 40-2/25	
GA50C4044xxx				
GA50C4044xxx	LR3 40-4/63	IP20-Box36	ALR3 40-2/45	IP20-Box35
GA50C4060xxx				
GA50C4060xxx	LR3 40-4/90	IP20-Box39	n.a	

AC Output Reactors

Motor side reactors limit voltage peaks at the motor winding, especially with long motor cables, thus improving the motor service life. Output reactors must be selected with the maximum output frequency in mind.

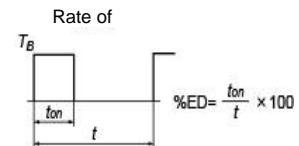
GA500 Model	up to 120 Hz		up to 50Hz	
	IP00	IP20 cover	IP00	IP20 cover
GA50CB001xxx	MDB 400/6,3	IP20-Box31	MR3 400/4	IP20-Box31
GA50CB002xxx				
GA50CB004xxx				
GA50CB006xxx	MDB 400/13	IP20-Box32	MR3 400/10	IP20-Box32
GA50CB010xxx				
GA50CB012xxx				
GA50CB018xxx	MDB 400/24	IP20-Box36	MR3 400/18	
GA50C2001xxx	MDB 400/6,3	IP20-Box31	MR3 400/4	IP20-Box31
GA50C2002xxx				
GA50C2004xxx				
GA50C2006xxx	MDB 400/13	IP20-Box32	MR3 400/10	IP20-Box32
GA50C2008xxx				
GA50C2010xxx				
GA50C2012xxx	MDB 400/24	IP20-Box36	MR3 400/18	
GA50C2018xxx				
GA50C2021xxx				
GA50C2030xxx	MDB 400/46	IP20-Box37	MR3 400/24	
GA50C2042xxx				
GA50C2056xxx				
GA50C2070xxx	MDB 400/72		MR3 400/37	IP20-Box33
GA50C2082xxx	MDB 400/110	IP20-Box39	MR3 400/48	IP20-Box35
GA50C4001xxx				
GA50C4002xxx				
GA50C4004xxx	MDB 400/6,3	IP20-Box31	MR3 400/4	IP20-Box31
GA50C4005xxx				
GA50C4007xxx				
GA50C4009xxx	MDB 400/13	IP20-Box32	MR3 400/10	IP20-Box32
GA50C4012xxx				
GA50C4018xxx				
GA50C4023xxx	MDB 400/24	IP20-Box36	MR3 400/18	
GA50C4031xxx				
GA50C4038xxx				
GA50C4044xxx	MDB 400/46	IP20-Box37	MR3 400/24	
GA50C4060xxx				
	MDB 400/72		MR3 400/37	IP20-Box33
	MDB 400/72		MR3 400/48	IP20-Box35
	MDB 400/72		MR3 400/61	IP20-Box35

Braking Resistors

GA500 drives have embedded braking transistors. Resistors selected from the table below can be directly connected to terminals B1 and B2. When connecting other resistors, the resistance must be higher than the minimum value listed below.

GA500 Model	HD		ND		Minimum Resistor (Ohm)
	Resistor 40% ED	Resistor 10% ED	Resistor 40% ED	Resistor 10% ED	
GA50CB001xxx	RH-0100W830	RH-0100W830	RH0100W330	RH0100W330	300
GA50CB002xxx	RH-0100W330	RH-0100W330			300
GA50CB004xxx	RH-0260W270	RH-0260W270	RH0260W270	RH0260W270	200
GA50CB006xxx	RH-0260W135	RH-0260W135	RH0260W135	RH0260W135	120
GA50CB010xxx	RH-0390W070	RH-0390W070	RH0390W070	RH0390W070	60
GA50CB012xxx					60
GA50CB018xxx	RH-0780W040	RH-0780W040-10	RH780W040	RH-0780W040-10	32
GA50C2001xxx	RH-0100W830	RH-0100W830	RH-0100W330	RH-0100W330	300
GA50C2002xxx	RH-0100W330	RH-0100W330			300
GA50C2004xxx	RH-0260W270	RH-0260W270	RH-0260W270	RH-0260W270	200
GA50C2006xxx	RH-0260W135	RH-0260W135	RH-0260W135	RH-0260W135	120
GA50C2008xxx	RH-0260W120	RH-0260W120	RH-0390W070	RH-0390W070	60
GA50C2010xxx	RH-0390W070	RH-0390W070			60
GA50C2012xxx			60		
GA50C2018xxx	RH-0780W040	RH-0780W040-10	RH-0780W040	RH-0780W040-10	32
GA50C2021xxx					32
GA50C2030xxx	RH9600W015	RH-9600W015-10	RH-9600W015	RH-9600W015-10	9.6
GA50C2042xxx					9.6
GA50C2056xxx	RH9600W015	RH-9600W015-10	RH-9600W015	RH-9600W015-10	9.6
GA50C2070xxx					9.6
GA50C2082xxx	RH-0100W830	RH-0100W830	RH-0100W830	RH-0100W830	9.6
GA50C4001xxx					750
GA50C4002xxx	RH-0100W830	RH-0100W830	RH-0100W830	RH-0100W830	750
GA50C4004xxx					510
GA50C4005xxx	RH-0260W270	RH-0260W270	RH-0260W270	RH-0260W270	240
GA50C4007xxx					200
GA50C4009xxx	RH-0520W120	RH-0520W120	RH-0520W120	RH-0520W120	100
GA50C4012xxx					100
GA50C4018xxx	RH-0780W040	RH-0780W040-10	RH-0780W040	RH-0780W040-10	32
GA50C4023xxx	RH-1560W040	RH-1560W040-10	RH-1560W040	RH-1560W040-10	32
GA50C4031xxx					20
GA50C4038xxx	RH-4800W022	RH-4800W022-10	RH-4800W022	RH-4800W022-10	20
GA50C4044xxx	RH-6000W022	RH-6000W022-10	RH-6000W022	RH-6000W022-10	19.2
GA50C4060xxx					19.2

- 10% ED : 120 s cycle time (t) and 12 s switch on time (ton)
- 40% ED : 120 s cycle time (t) and 48 s switch on time (ton)





GA500

BALANCING POWER WITH PERFECTION



www.ga500.yaskawa-perform.de

YASKAWA Europe GmbH

Hauptstr. 185
65760 Eschborn
Germany

+49 6196 569-500
support@yaskawa.eu.com
www.yaskawa.eu.com

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