

# YASKAWA

# GA500 Selection Guide

AC MICRODRIVE FOR INDUSTRIAL APPLICATIONS  
1/6 to 40 HP

IT'S PERSONAL



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## Preface

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## Additional Resources

The Yaskawa.com web site has the most current information for all Yaskawa products. When researching product specifications or features the Yaskawa web site is the best resource to use. Some useful links for the GA500 drive product are listed here and throughout this document:

Resource Links	
<a href="#">GA500 Brochure</a>	<a href="#">GA500 Flyer</a>
<a href="#">GA500 Product Transition Guide</a>	



# GA500 AC Microdrives



## Drive Selection

The GA500 precisely controls induction, permanent magnet, and synchronous reluctance motors providing versatility to run a variety of applications with just one drive. The times of complex motor setup are over. With the new EZ Vector mode, the GA500 can run all of these motor types without comprehensive tuning.

- Time and Cost Savings
- Easy Installation and System Integration
- Easy to Use - Easy to Maintain
- More Reliable - Easier Machine Design

Standard (IP20/Protected Chassis) drives are intended for clean environments and can be mounted 3 different ways as follows:

- 1) In a separate enclosure with heatsink internal. Extra mounting brackets are not required.
- 2) In a separate enclosure with heatsink external. Refer to Enclosure Adapters and Kits for drives requiring extra mounting brackets.
- 3) Mounted without an enclosure. UL Type 1 Adapters must be used when mounting the drive without an enclosure.

The GA500 offers two separate performance ratings; Heavy Duty and Normal Duty. Heavy Duty is capable of creating more powerful torque, while Normal Duty allows the drive to operate a larger motor.

### Catalog Code Designation

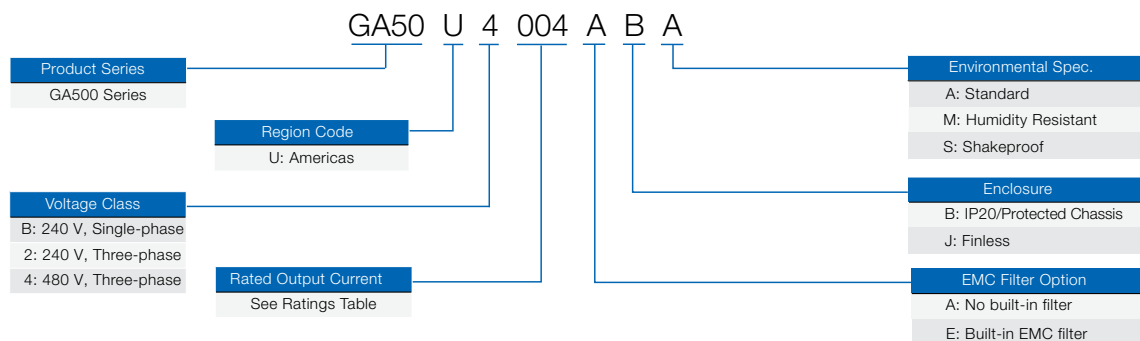


Table 1: 240 V, Single-Phase Input, IP20/Protected Chassis Drives, 1/6 to 5 HP

Normal Duty Output <sup>1</sup>		Heavy Duty Output <sup>1</sup>		Standard IP20 Drives <sup>2</sup>	Built-In EMC IP20 Drives <sup>3</sup>
HP	Amps	HP	Amps	Catalog Code GA50U . .	Catalog Code GA50U . .
1/6	1.2	1/6	0.8	B001ABA	B001EBA
1/4	1.9	1/4	1.6	B002ABA	B002EBA
3/4	3.5	1/2	3	B004ABA	B004EBA
1.5	6	1	5	B006ABA	B006EBA
3	9.6	2	8	B010ABA	B010EBA
3	12.2	3	11	B012ABA	B012EBA
N/A	N/A	5	17.5	B018ABA	-

- Output capacities stated are for conditions of single-phase input or DC input.
- Standard (IP20/Protected Chassis) Drives are intended for clean environments, and can be mounted 3 different ways as follows:#
  - In a separate enclosure with heatsink internal (no extra mounting brackets required)#
  - In a separate enclosure with heatsink external. See External Heatsink Adapters for sizes requiring extra mounting brackets#
  - Without a separate enclosure, all sizes require UL Type 1 Adapters (see UL Type 1 Adapters)
- Built-in EMC (IP20) Drives are subject to a 16 week lead time if no forecast is provided.

Table 2: 240 V, Three-Phase Input, IP20/Protected Chassis Drives, 1/6 to 30 HP

Normal Duty Output <sup>1</sup>		Heavy Duty Output <sup>1</sup>		Standard IP20 Drives <sup>2</sup>	Built-in EMC IP20 Drives <sup>3</sup>
HP	Amps	HP	Amps	Catalog Code GA50U . .	Catalog Code GA50U . .
1/6	1.2	1/6	0.8	2001ABA	2001EBA
1/4	1.9	1/4	1.6	2002ABA	2002EBA
3/4	3.5	1/2	3	2004ABA	2004EBA
1.5	6	1	5	2006ABA	2006EBA
3	9.6	2	8	2010ABA	2010EBA
4	12.2	3	11	2012ABA	2012EBA
7.5	21	5	17.6	2021ABA	2021EBA
10	30	7.5	25	2030ABA	2030EBA
15	42	10	33	2042ABA	2042EBA
20	56	15	47	2056ABA	2056EBA
25	70	20	60	2070ABA	2070EBA
30	82	25	75	2082ABA	2082EBA

- Output capacities stated are for conditions of 3 phase input or DC input. See Single-Phase Drive Selection for single phase capability.
- Standard (IP20/Protected Chassis) Drives are intended for clean environments, and can be mounted 3 different ways as follows:#
  - In a separate enclosure with heatsink internal (no extra mounting brackets required)#
  - In a separate enclosure with heatsink external. See External Heatsink Adapters for sizes requiring extra mounting brackets#
  - Without a separate enclosure, all sizes require UL Type 1 Adapters (see UL Type 1 Adapters)
- Built-in EMC (IP20) Drives are subject to a 16 week lead time if no forecast is provided.

Table 3: 480 V, Three-Phase Input, IP20/Protected Chassis Drive, 1/2 to 40 HP

Normal Duty Output <sup>1</sup>		Heavy Duty Output <sup>1</sup>		Standard IP20 Drives <sup>2</sup>	Built-in EMC IP20 Drives <sup>3</sup>
HP	Amps	HP	Amps	Catalog Code GA50U . .	Catalog Code GA50U . .
1/2	1.2	1/2	1.2	4001ABA	4001EBA
1	2.1	3/4	1.8	4002ABA	4002EBA
2	4.1	2	3.4	4004ABA	4004EBA
3	5.4	3	4.8	4005ABA	4005EBA
4	7.1	3	5.6	4007ABA	4007EBA
5	8.9	4	7.3	4009ABA	4009EBA
7.5	11.9	5	9.2	4012ABA	4012EBA
10	17.5	10	14.8	4018ABA	4018EBA
15	23.4	10	18	4023ABA	4023EBA
20	31	15	24	4031ABA	4031EBA
25	38	20	31	4038ABA	4038EBA
30	44	25	39	4044ABA	4044EBA
40	60	30	45	4060ABA	4060EBA

- Output capacities stated are for conditions of 3 phase input or DC input. See Single-Phase Input Drive Selection for single phase capability.
- Standard (IP20/Protected Chassis) Drives are intended for clean environments, and can be mounted 3 different ways as follows:#  
A) In a separate enclosure with heatsink internal (no extra mounting brackets required)#  
B) In a separate enclosure with heatsink external. See External Heatsink Adapters for sizes requiring extra mounting brackets#  
C) Without a separate enclosure, all sizes require UL Type 1 Adapters (see UL Type 1 Adapters)
- Built-in EMC (IP20) Drives are subject to a 16 week lead time if no forecast is provided.

## GA500 Drive Variants

GA500 drive variants provide enhanced or alternate capabilities to that of the standard GA500 drive. #

All GA500 drive variants, with the exception to the High Frequency Output, are subject to a 16 week lead time if no forecast is provided.

Table 4: 240 V, Single-Phase Input Drive Selection

Normal Duty Output <sup>1</sup>		Heavy Duty Output <sup>1</sup>		High Frequency Output (2000 Hz)	Shakeproof	Humidity Resistance	Humidity Resistance (w/EMC Filter)	Finless
HP	Amps	HP	Amps	Catalog Code GA50U . . .	Catalog Code GA50U . . .	Catalog Code GA50U . . .	Catalog Code GA50U . . .	Catalog Code GA50U . . .
1/6	1.2	1/6	0.8	B001ABA-134	B001ABS	B001ABM	B001EBM	B001AJA
1/4	1.9	1/4	1.6	B002ABA-134	B002ABS	B002ABM	B002EBM	B002AJA
3/4	3.3	1/2	3	B004ABA-134	B004ABS	B004ABM	B004EBM	B004AJA
1.5	6	1	5	B006ABA-134	B006ABS	B006ABM	B006EBM	B006AJA
3	9.6	2	8	B010ABA-134	B010ABS	B010ABM	B010EBM	B010AJA
3	12	3	11	B012ABA-134	B012ABS	B012ABM	B012EBM	B012AJA
N/A	N/A	5	17.5	B018ABA-134	B018ABS	B018ABM	N/A	N/A

1. Output capacities stated are for conditions of single-phase input or DC input.

Table 5: 240 V, Three-Phase Input Drive Selection

Normal Duty Output <sup>1</sup>		Heavy Duty Output <sup>1</sup>		High Frequency Output (2000 Hz)	Shakeproof	Humidity Resistance	Humidity Resistance (w/EMC Filter)	Finless
HP	Amps	HP	Amps	Catalog Code GA50U . . .	Catalog Code GA50U . . .	Catalog Code GA50U . . .	Catalog Code GA50U . . .	Catalog Code GA50U . . .
1/6	1.2	1/6	0.8	2001ABA-134	2001ABS	2001ABM	2001EBM	2001AJA
1/4	1.9	1/4	1.6	2002ABA-134	2002ABS	2002ABM	2002EBM	2002AJA
3/4	3.5	1/2	3	2004ABA-134	2004ABS	2004ABM	2004EBM	2004AJA
1.5	6	1	5	2006ABA-134	2006ABS	2006ABM	2006EBM	2006AJA
3	9.6	2	8	2010ABA-134	2010ABS	2010ABM	2010EBM	2010AJA
4	12.2	3	11	2012ABA-134	2012ABS	2012ABM	2012EBM	2012AJA
7.5	21	5	17.6	2021ABA-134	2021ABS	2021ABM	2021EBM	2021AJA
10	30	7.5	25	2030ABA-134	2030ABS	2030ABM	2030EBM	Contact Factory
15	42	10	33	2042ABA-134	2042ABS	2042ABM	2042EBM	
20	56	15	47	2056ABA-134	2056ABS	2056ABM	2056EBM	
25	70	20	60	2070ABA-134	2070ABS	2070ABM	2070EBM	
30	82	25	75	2082ABA-134	2082ABS	2082ABM	2082EBM	N/A

1. Output capacities stated are for conditions of 3 phase input or DC input. See Single-Phase Input Drive Selection for single phase capability.



## 480 V, Three-Phase Input Drive Selection

Normal Duty Output <sup>1</sup>		Heavy Duty Output <sup>1</sup>		High Frequency Output (2000 Hz)	Shakeproof	Humidity Resistance	Humidity Resistance (w/EMC Filter)	Finless
HP	Amps	HP	Amps	Catalog Code GA50U . . .	Catalog Code GA50U . . .	Catalog Code GA50U . . .	Catalog Code GA50U . . .	Catalog Code GA50U . . .
0.5	1.2	0.5	1.2	4001ABA-134	4001ABS	4001ABM	4001EBM	4001AJA
1	2.1	0.75	1.8	4002ABA-134	4002ABS	4002ABM	4002EBM	4002AJA
2	4.1	2	3.4	4004ABA-134	4004ABS	4004ABM	4004EBM	4004AJA
3	5.4	3	4.8	4005ABA-134	4005ABS	4005ABM	4005EBM	4005AJA
4	7.1	3	5.6	4007ABA-134	4007ABS	4007ABM	4007EBM	4007AJA
5	8.9	4	7.3	4009ABA-134	4009ABS	4009ABM	4009EBM	4009AJA
7.5	11.9	5	9.2	4012ABA-134	4012ABS	4012ABM	4012EBM	4012AJA
10	17.5	10	14.8	4018ABA-134	4018ABS	4018ABM	4018EBM	Contact Factory
15	23.4	10	18	4023ABA-134	4023ABS	4023ABM	4023EBM	
20	31	15	24	4031ABA-134	4031ABS	4031ABM	4031EBM	
25	38	20	31	4038ABA-134	4038ABS	4038ABM	4038EBM	
30	44	25	39	4044ABA-134	4044ABS	4044ABM	4044EBM	N/A
40	60	30	45	4060ABA-134	4060ABS	4060ABM	4060EBM	N/A

1. Output capacities stated are for conditions of 3 phase input or DC input. See Single-Phase Input Drive Selection for single phase capability.

## Single-Phase Input Derate

Table 6: 240 V, Single-Phase Input, Three-Phase Output

GA500.. <sup>1,2</sup>	No Reactor		With Reactor					
	Drive Output Capacity		Drive Output Capacity		AC Input Type		DC Bus Type	
	Motor Power (HP)	Motor FLA	Motor Power (HP)	Motor FLA	Open	UL Type 1 Enclosed	Open	UL Type 1 Enclosed
					Catalog Code	Catalog Code	Catalog Code	Catalog Code
2001	-	-	1/8	0.61	URX000283	URX000652	URX000033	URX000215
2002	1/8	0.61	1/4	1.16	URX000291	URX000651	URX000036	URX000207
2004	1/4	1.16	1/3	1.52	URX000295	URX000409	05P00608-3007	URX000208
2006	1/3	1.52	1/2	2.20	URX000299	URX000410	05P00608-3007	URX000208
2010	1/2	2.2	1	4.20	URX000303	URX000411	URX000043	N/A
2012	1	4.2	1.5	6.00	URX000307	URX000413	05P00620-0113	URX000435
2021	1.5	6	3	9.60	URX000315	URX000418	05P00620-0115	URX000259
2030	1.5	6	3	9.60	URX000315	URX000418	05P00620-0115	URX000259
2042	3	9.6	5	15.20	URX000323	URX000422	05P00620-0120	URX000261
2056	3	9.6	5	15.20	URX000323	URX000422	05P00620-0120	URX000261
2070	5	15.2	10	28.00	URX000329	URX000501	URX000064	URX000213
2082	7.5	22	10	28.00	URX000329	URX000501	URX000063	URX000264

1. This information reflects derating of three phase drives for single-phase input applications. See Single-Phase Converter to achieve full power with no derating on some drives.
2. Select partial catalog code from this single-phase table. Then get complete catalog code from the Drive tables based on drive type.

Table 7: 480 V, Single-Phase Input, Three-Phase Output

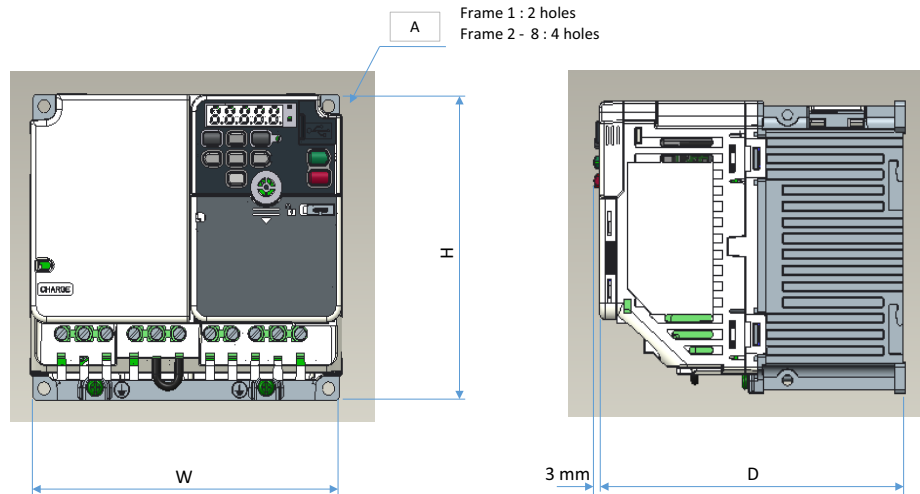
GA50U.. <sup>1,2</sup>	No Reactor		With Reactor					
	Drive Output Capacity		Drive Output Capacity		AC Input Type		DC Bus Type	
					Open	UL Type 1 Enclosed	Open	UL Type 1 Enclosed
	Motor Power (HP)	Motor FLA	Motor Power (HP)	Motor FLA	Catalog Code	Catalog Code	Catalog Code	Catalog Code
4001	1/8	0.3	1/3	0.6	URX000291	URX000651	URX000036	N/A
4002	1/4	0.6	1/3	0.8	URX000291	URX000651	URX000036	N/A
4004	1/2	1.1	1	2.1	URX000299	URX000410	URX000040	N/A
4005	1	2.1	2	3.0	URX000304	URX000504	05P00620-0110	URX000257
4007	1	2.1	2	3.4	URX000304	URX000504	05P00620-0111	URX000208
4009	2	3.4	3	4.8	URX000308	URX000414	05P00652-0213	URX000209
4012	2	3.4	3	4.8	URX000308	URX000414	05P00652-0213	URX000209
4018	2	3.4	3	5	URX000308	URX000414	05P00652-0213	URX000209
4023	3	4.8	5	8	URX000313	URX000417	URX000048	URX000210
4031	3	4.8	7.5	11	URX000316	URX000419	URX000052	URX000211
4038	5	7.6	10	14	URX000320	URX000421	URX000055	URX000223
4044	5	7.6	10	14	URX000320	URX000421	URX000055	URX000223
4060	7.5	11	15	21	URX000327	URX000425	URX000057	URX000184

1. This information reflects derating of three phase drives for single-phase input applications. See Single-Phase Converter to achieve full power with no derating on some drives.
2. Select partial catalog code from this single-phase table. Then get complete catalog code from Drive tables based on drive type.

## Dimensions & Weights

### IP20/Protected Chassis Dimensions

Figure 1: Drive Dimensions



IP20/Protected Chassis Drive Without EMC Filter

Table 8: Dimensions without EMC Filter

Dimensions in (mm)			
Frame	Height	Width	Depth
1.1	5.04 (128)	2.68 (68)	2.99 (76)
1.2	5.04 (128)	2.68 (68)	4.25 (108)
1.3	5.04 (128)	2.68 (68)	4.65 (118)
1.4	5.04 (128)	2.68 (68)	5.04 (128)
2.1	5.04 (128)	4.25 (108)	3.19 (81)
2.2	5.04 (128)	4.25 (108)	3.90 (99)
2.3	5.04 (128)	4.25 (108)	5.08 (129)
2.4	5.04 (128)	4.25 (108)	5.41 (138)
2.5	5.04 (128)	4.25 (108)	6.06 (154)
3.1	5.04 (128)	5.51 (140)	5.63 (143)
3.2	5.04 (128)	5.51 (140)	6.42 (163)
4	5.04 (128)	6.69 (170)	7.09 (180)
5	10.24 (260)	5.51 (140)	5.51 (140)
6	11.81 (300)	7.09 (180)	5.63 (143)
7	13.78 (350)	8.66 (220)	7.36 (187)
8	13.78 (350)	7.48 (190)	8.03 (204)

Table 9: Dimensions with EMC Filter

Dimensions in (mm)			
Frame	Height	Width	Depth
1.1	5.04 (128)	2.68 (68)	4.57 (116)
1.2	5.04 (128)	2.68 (68)	5.83 (148)
1.3	5.04 (128)	2.68 (68)	6.22 (158)
1.4	5.04 (128)	2.68 (68)	6.61 (168)
2.1	5.04 (128)	4.25 (108)	4.96 (126)
2.2	5.04 (128)	4.25 (108)	5.67 (144)
2.3	5.04 (128)	4.25 (108)	6.85 (174)
2.4	5.04 (128)	4.25 (108)	7.19 (183)
2.5	5.04 (128)	4.25 (108)	7.83 (199)
3.1	5.04 (128)	5.51 (140)	7.60 (193)
3.2	5.04 (128)	5.51 (140)	7.99 (203)
5	10.24 (260)	5.51 (140)	7.72 (196)
6	11.81 (300)	7.09 (180)	7.72 (196)
7	13.78 (350)	8.66 (220)	8.50 (216)
8	13.78 (350)	7.48 (190)	9.88 (251)

Table 10: 240 V, Single-Phase Drives

Normal Duty (ND)	Heavy Duty (HD)	Catalog Code GA50U...	Output Amps		Weight lb (kg)	Frame
			ND	HD		
1/6	1/6	B001ABA	1.2	0.8	1.1 (0.5)	1.1
1/4	1/4	B002ABA	1.9	1.6		1.1
3/4	1/2	B004ABA	3.5	3	1.8 (0.8)	1.3
1.5	1	B006ABA	6	5	3.3 (1.5)	2.4
3	2	B010ABA	9.6	8		2.5
3	3	B012ABA	12.2	11	4.6 (2.1)	3.2
N/A	5	B018ABA	N/A	17.6	6.4 (2.9)	4

Table 11: 240 V, Three-Phase Drives

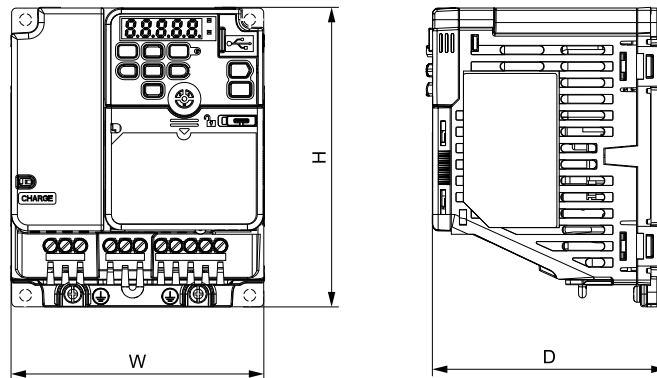
Normal Duty (ND)	Heavy Duty (HD)	Catalog Code GA50U...	Output Amps		Weight (kg)	Frame
			ND	HD		
1/6	1/6	2001	1.2	0.8	1.1 (0.5)	1.1
1/4	1/4	2002	1.9	1.6		1.1
3/4	1/2	2004	3.5	3.0	1.8 (0.8)	1.2
1.5	1	2006	6	5.0	2.0 (0.9)	1.4
3	2	2010	9.6	8.0	3.3 (1.5)	2.3
4	3	2012	12.2	11.0		2.4
7.5	5	2021	21	17.6	4.4 (2.2)	3.1
10	7.5	2030	30	25.0	7.5 (3.4)	5
15	10	2042	42	33.0	7.9 (3.6)	5
20	15	2056	56	47.0	12.1 (5.5)	6
25	20	2070	70	60.0	16.5 (7.5)	7
30	25	2082	82	75.0	17.6 (8.0)	7

Table 12: 480 V, Three-Phase Drives

Normal Duty (ND)	Heavy Duty (HD)	Catalog Code GA50U...	Output Amps		Weight lb (kg)	Frame
			ND	HD		
1/2	1/2	4001	1.2	1.2	1.8 (0.8)	2.1
1	3/4	4002	2.1	1.8	2.0 (0.9)	2.2
2	2	4004	4.1	3.4	3.53 (1.5)	2.4
3	3	4005	5.4	4.8		2.5
4	3	4007	7.1	5.6		2.5
5	4	4009	8.9	7.3		2.5
7.5	5	4012	11.9	9.2	4.4 (2.0)	3.1
10	10	4018	17.5	14.8	6.6 (3.0)	5
15	10	4023	23.4	18	7.1 (3.2)	5
20	15	4031	31	24	10.1 (4.6)	6
25	20	4038	38	31	10.6 (4.8)	6
30	25	4044	44	39	14.3 (6.5)	8
40	30	4060	60	45		8

## Finless Drive Chassis Dimensions

Figure 2: Drive Dimensions



Finless Drive Dimensions

Table 13: 240 V, Single-Phase Drives

Model	Dimensions in (mm)			Weight lb (kg)
	W	H	D	
B001	2.68 (68)	5.04 (128)	2.80 (71)	1.32 (0.6)
B002	2.68 (68)	5.04 (128)	2.80 (71)	1.32 (0.6)
B004	2.68 (68)	5.04 (128)	3.19 (81)	1.32 (0.6)
B006	4.25 (108)	5.04 (128)	3.19 (81)	3.19 (0.9)
B010	4.25 (108)	5.04 (128)	3.64 (92.5)	2.20 (1.0)
B012	5.51 (140)	5.04 (128)	3.86 (98)	2.65 (1.2)

Table 14: 240 V, Three-Phase Drives

Model	Dimensions in (mm)			Weight lb (kg)
	W	H	D	
2001	2.68 (68)	5.04 (128)	2.80 (71)	1.32 (0.6)
2002	2.68 (68)	5.04 (128)	2.80 (71)	1.32 (0.6)
2004	2.68 (68)	5.04 (128)	2.80 (71)	1.32 (0.6)
2006	2.68 (68)	5.04 (128)	2.80 (71)	1.32 (0.6)
2010	4.25 (108)	5.04 (128)	2.85 (72.5)	1.76 (0.8)
2012	4.25 (108)	5.04 (128)	3.19 (81)	1.98 (0.9)
2021	5.51 (140)	5.04 (128)	3.07 (78)	2.65 (1.2)

Table 15: 480 V, Three-Phase Drives

Model	Dimensions in (mm)			Weight lb (kg)
	W	H	D	
4001	4.25 (108)	5.04 (128)	2.95 (75)	1.76 (0.8)
4002	4.25 (108)	5.04 (128)	2.95 (75)	1.76 (0.8)
4004	4.25 (108)	5.04 (128)	3.29 (83.5)	1.98 (0.9)
4005	4.25 (108)	5.04 (128)	3.94 (100)	2.20 (1.0)
4007	4.25 (108)	5.04 (128)	3.94 (100)	2.20 (1.0)
4009	4.25 (108)	5.04 (128)	3.94 (100)	2.20 (1.0)
4012	5.51 (140)	5.04 (128)	3.07 (78)	2.65 (1.2)

## Drive Specifications

Power Ratings	
Item	Specification
Overload Capacity	110%/1 min. (Normal Duty) or 150%/1 min. (Heavy Duty)
Rated Voltage	200 to 240 VAC, -15 to +10%
	380 to 480 VAC, -15 to +10%
Capacity Range	240 V, Single-Phase: 1/6 to 5 HP (0.1 to 3.7 kW)
	240 V, Three-Phase: 1/6 to 30 HP (0.1 to 22kW)
	480 V, Three-Phase: 1/2 to 40 HP (0.2 to 30kW)
Input Frequency	50/60 Hz +/-5%
Output Voltage Accuracy	+/-5%
Output Frequency	0 to 590 Hz (*special software for up to 1000 Hz)
Control Method	V/f, Open Loop (IM/PM), Advanced Open Loop (IM/PM), EZ Open Loop Vector
Motor Control	Induction Motor (IM), Permanent Magnet Motor, Synchronous Reluctance Motor (SynRM)
Operating Environment	
Item	Specification
Ambient Temperature	-10 to +50 °C (IP20/Protected Chassis), -10 to +40 °C (IP20/UL Type 1), up to +60 °C with derating
Storage Temperature	-40 to +70 °C (short-term temperature during transportation)
Humidity	95% RH or less (non-condensing)
Altitude	Up to 1000 meters without derating, up to 4000 m with derating
Shock	10 to 20 Hz: 9.8 m/s <sup>2</sup>
	20 to 55 Hz: 5.9 m/s <sup>2</sup>
Protection Design	IP20/Protected Chassis Standard, IP20/UL Type 1 kit optional
Mounting	Side-by-side, DIN rail, external heatsink
Conformal Coating (PCB's)	IEC 60721-3-3, Class 3C2 (chemical gases), Class 3S2 (solid particles)
Standards	CE, UL, cUL, KC, RCM, EAC, RoHS
Functional Safety	IEC/EN61508 SIL3 (STO), PL <sub>e</sub>



# Network Communication Options

These cards, cables, and devices add control functionality to the standard drive. Items are shipped loose and unmounted.

Table 16: Option Cards

Option <sup>1</sup>	Description
SI-EN3	EtherNet/IP
SI-EN3D	EtherNet/IP dual port
SI-ES3	EtherCAT
SI-EM3	Modbus/TCP
SI-EM3D	Modbus/TCP dual port
SI-EP3	PROFINET
SI-P3	PROFIBUS-DP
SI-N3	DeviceNet
SI-S3	CANopen
SI-C3	CC-Link
SI-T3	MECHATROLINK II
SI-ET3	MECHATROLINK III

1. Use of an option card requires the Option Card Carrier.

Table 17: Option Card Carrier

Option	Purpose
JOHB-GA50	For use when installing a communication option card on the GA500.

Diagram illustrating the components of the Option Card Carrier (JOHB-GA50) and its installation on the GA500 drive. The components shown are:

- Network Option Card
- Option Card Carrier and Mounting Hardware
- Drive Cover

Kit

## Keypad and Accessories

**Additional Information**

[Keypads, Cables, and Mounting Kits](#)

Table 18: Keypads

Catalog Code	Description
JVOP-KPLCA04MEB	LCD Keypad (standard, non-Bluetooth)
JVOP-KPLCC04MBB	LCD Keypad with Bluetooth

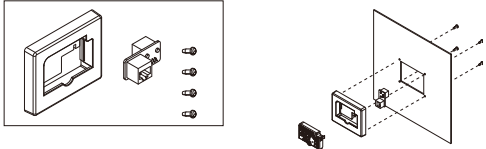

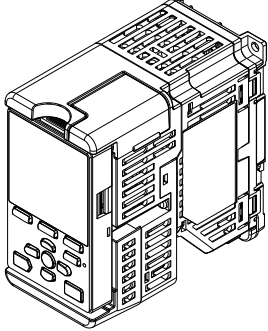




Standard LCD Keypad



LCD Keypad with Bluetooth

Table 19: Remote Mount Adapters

Catalog Code	Description	
ZPBA-GA500	UL Type 1 LED keypad mounting kit for standard GA500 keypad	
JVOP-KPBCH04AAA	Blank LED keypad when external mounting GA500 keypad (optional)	
JZSP-GA500	LCD keypad mounting kit (for mounting keypad onto drive	
900-192-933-001	UL Type 1 Keypad Panel Mount Kit A (brackets have tapped holes for use with screws) (For use with optional LCD keypad)	
900-192-933-002	UL Type 1 Keypad Panel Mount Kit B (brackets have untapped holes for use with panel studs) (For use with optional LCD keypad)	


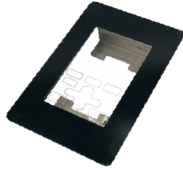
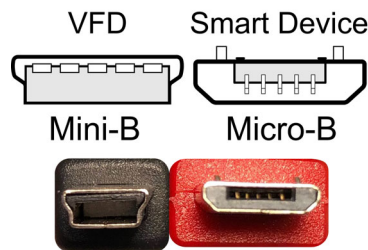
Catalog Code	Description	
900-239-230-001	Outdoor UL Type 12/3/3R Keypad Panel Mount (For use with optional LCD keypad)	
UUX001955	Indoor/Outdoor UL Type 12/3/3R/4X Keypad Panel Mount (For use with optional LCD keypad)	

Table 20: Cables

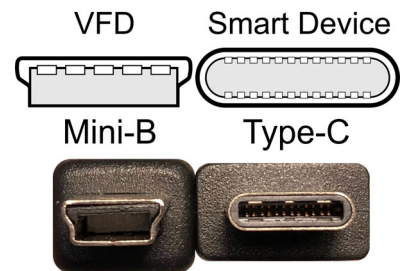
Catalog Code	Description
UWR0051	Keypad Remote Mount Cable - 1 Meter
UWR0052	Keypad Remote Mount Cable - 3 Meter
UWR01258	USB Cable for PC to Drive Communication - 3 Meter

Table 21: Android Mobile Device Interface Cables (for connecting Android device to USB port on drive)

Catalog Code	Description
UWR01516-B	USB Mini-B to USB Micro-B. On-The-Go (OTG) compatible, 2-meter length
UWR01516-C	USB Mini-B to USB Type-C. On-The-Go (OTG) compatible, 2-meter length



UWR01516-B - USB Mini-B to USB Micro-B



UWR01516-C - USB Mini-B to USB Type-C

# Enclosure Adapters and Kits

These adapters are for mounting the standard IP20 drives directly to a wall, DIN Rail, or machine in a clean environment, or inside a UL Type 1 enclosure with external heatsink. The UL Type 1 Adapters convert a Protected Chassis Drive without EMC (IP20) to an enclosed wall-mounted drive (UL Type 1).#

Additional Information
Enclosure Adapters and Kits

## IP20/UL Type 1 Adapters



This adapter turns the GA500 IP20/Protected Chassis into a GA500 UL Type 1 drive.

Table 22: 240 V, Single-Phase, IP20/UL Type 1 Adapter Kit

Catalog Code GA50U . .	UL Type 1 Adapters
	Catalog Code
B001ABA	ZBAA-GA50V1-1
B002ABA	ZBAA-GA50V1-1
B004ABA	ZBAA-GA50V1-2
B006ABA	ZBAA-GA50V2-1
B010ABA	ZBAA-GA50V2-2
B012ABA	ZBAA-GA50V3-1
B018ABA	ZBAA-GA50V4-1

Table 23: 240 V, Three-Phase, IP20/UL Type 1 Adapter Kit

Catalog Code GA50U . .	UL Type 1 Adapters
	Catalog Code
2001ABA	ZBAA-GA50V1-1
2002ABA	ZBAA-GA50V1-1
2004ABA	ZBAA-GA50V1-1
2006ABA	ZBAA-GA50V1-1
2010ABA	ZBAA-GA50V2-3
2012ABA	ZBAA-GA50V2-1
2021ABA	ZBAA-GA50V3-2
2030ABA	ZBAA-GA50V5-1
2042ABA	ZBAA-GA50V5-1
2056ABA	ZBAA-GA50V6-1
2070ABA	ZBAA-GA50V7-1
2082ABA	ZBAA-GA50V7-1

Table 24: 480 V, Three-Phase, IP20/UL Type 1 Adapter Kit

Catalog Code GA50U . .	UL Type 1 Adapters
	Catalog Code
4001ABA	ZBAA-GA50V2-4
4002ABA	ZBAA-GA50V2-4
4004ABA	ZBAA-GA50V2-5
4005ABA	ZBAA-GA50V2-2
4007ABA	ZBAA-GA50V2-2
4009ABA	ZBAA-GA50V2-2
4012ABA	ZBAA-GA50V3-2
4018ABA	ZBAA-GA50V5-1
4023ABA	ZBAA-GA50V5-1
4031ABA	ZBAA-GA50V6-1
4038ABA	ZBAA-GA50V6-1
4044ABA	ZBAA-GA50V8-1
4060ABA	ZBAA-GA50V8-1

## External Heatsink Adapters

These adapters are for mounting standard IP20/Protected Chassis drives with the heatsink external to an enclosure.

Figure 3: External Heatsink Adapters

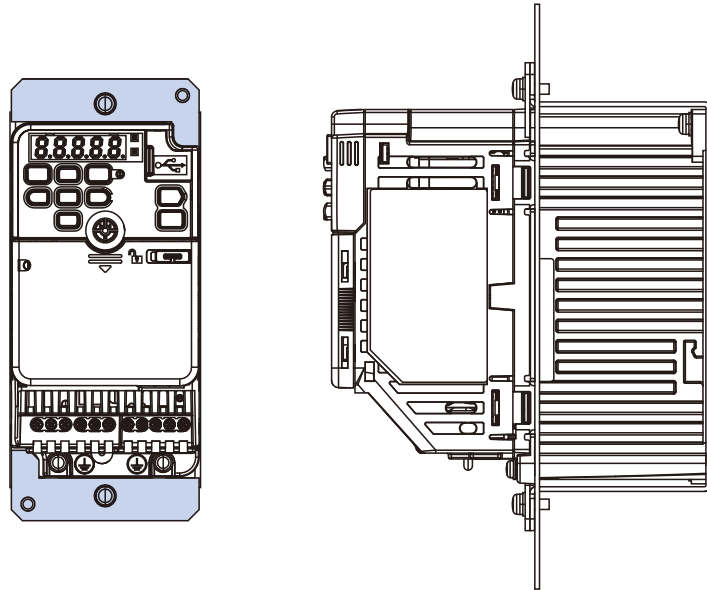


Table 25: 240 V, Single-Phase, Drive Mounting Adapters

Catalog Code GA50U . .	External Heatsink Adapters	
	Catalog Code	
B001*BA	ZPSA-GA50V1-1	
B002*BA	ZPSA-GA50V1-1	
B004*BA	ZPSA-GA50V1-2	
B006*BA	ZPSA-GA50V2-2	
B010*BA	ZPSA-GA50V2-3	
B012*BA	ZPSA-GA50V3-1	
B018*BA	ZPSA-GA50V4-1	

Table 26: 240 V, Three-Phase, Drive Mounting Adapters

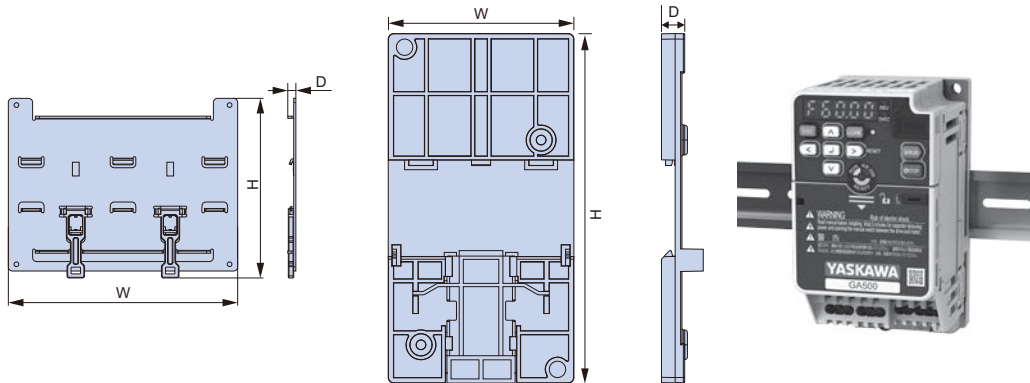
Catalog Code GA50U . .	External Heatsink Adapter
	Catalog Code
2001*BA	ZPSA-GA50V1-1
2002*BA	ZPSA-GA50V1-1
2004*BA	ZPSA-GA50V1-2
2006*BA	ZPSA-GA50V1-3
2010*BA	ZPSA-GA50V2-3
2012*BA	ZPSA-GA50V2-3
2021*BA	ZPSA-GA50V3-1
2030*BA	ZPSA-GA50V5-1
2042*BA	ZPSA-GA50V5-1
2056*BA	ZPSA-GA50V6-1
2070*BA	ZPSA-GA50V7-1
2082*BA	ZPSA-GA50V7-1

Table 27: 480 V, Three-Phase, Drive Mounting Adapters

Catalog Code GA50U . .	External Heatsink Adapter
	Catalog Code
4001*BA	ZPSA-GA50V2-1
4002*BA	ZPSA-GA50V2-2
4004*BA	ZPSA-GA50V2-2
4005*BA	ZPSA-GA50V2-3
4007*BA	ZPSA-GA50V2-3
4009*BA	ZPSA-GA50V2-3
4012*BA	ZPSA-GA50V3-1
4018*BA	ZPSA-GA50V5-1
4023*BA	ZPSA-GA50V5-1
4031*BA	ZPSA-GA50V6-1
4038*BA	ZPSA-GA50V6-1
4044*BA	ZPSA-GA50V8-1
4060*BA	ZPSA-GA50V8-1



## DIN Rail Mounting Adapters



By utilizing the DIN rail attachment, equipped drives can be attached and detached with one touch. DIN adapters can be mounted on models with dimensions less than 170 mm wide and less than 128 mm in height.

Table 28: Single-Phase IP20/Protected Chassis without EMC Filter DIN Rail Mounting Adapters

Catalog Code GA50U . .	DIN Rail Kit
	Catalog Code
B001ABA	ZPZ-GA50V1
B002ABA	
B004ABA	
B006ABA	ZPZ-GA50V2
B010ABA	ZPZ-GA50V3
B012ABA	
B018ABA	EZZ08122D

Table 29: 240 V, Three-Phase IP20/Protected Chassis without EMC Filter, DIN Rail Mounting Adapters

Catalog Code GA50U . .	DIN Rail Kit
	Catalog Code
2001ABA	ZPZ-GA50V1
2002ABA	
2004ABA	
2006ABA	
2010ABA	ZPZ-GA50V2
2012ABA	
2021ABA	ZPZ-GA50V3
2030ABA	These models are not DIN Rail mountable.
2042ABA	
2056ABA	
2070ABA	
2082ABA	

Table 30: 480 V, Three-Phase IP20/Protected Chassis without EMC Filter, DIN Rail Mounting Adapters

Catalog Code GA50U . .	DIN Rail Kit
	Catalog Code
4001ABA	ZPZ-GA50V2
4002ABA	
4004ABA	
4005ABA	
4007ABA	
4009ABA	
4012ABA	ZPZ-GA50V3
4018ABA	These models are not DIN Rail mountable.
4023ABA	
4031ABA	
4038ABA	
4044ABA	
4060ABA	

## Shield Clamp Kit

When using a shielded motor cable, the GA500 shield clamp kit provides a convenient termination point for both the ground and shield of the motor cable

Table 31: Single-Phase IP20/Protected Chassis without EMC Filter Shield Clamp Kit

Catalog Code GA50U . .	Shield Clamp Kit
	Catalog Code
B001ABA	ZHZ-GA50V1
B002ABA	
B004ABA	
B006ABA	ZHZ-GA50V2
B010ABA	
B012ABA	ZHZ-GA50V3
B018ABA	ZHZ-GA50V4

Table 32: 240 V, Three-Phase IP20/Protected Chassis without EMC Filter, Shield Clamp Kit

Catalog Code GA50U . .	Shield Clamp Kit
	Catalog Code
2001ABA	ZHZ-GA50V1
2002ABA	
2004ABA	
2006ABA	
2010ABA	ZHZ-GA50V2
2012ABA	
2021ABA	ZHZ-GA50V3
2030ABA	ZHZ-GA50V5
2042ABA	
2056ABA	ZHZ-GA50V6
2070ABA	ZHZ-GA50V7
2082ABA	

Table 33: 480 V, Three-Phase IP20/Protected Chassis without EMC Filter, Shield Clamp Kit

Catalog Code GA50U . .	Shield Clamp Kit
	Catalog Code
4001ABA	ZHZ-GA50V2
4002ABA	
4004ABA	
4005ABA	
4007ABA	
4009ABA	
4012ABA	ZHZ-GA50V3
4018ABA	ZHZ-GA50V5
4023ABA	
4031ABA	ZHZ-GA50V6
4038ABA	
4044ABA	ZHZ-GA50V8
4060ABA	

# Power Options

Power options are add on devices that can be used to help increase power factor, improve harmonics, and dissipate regenerative energy.

Name	Purpose
EMC Filters	<ul style="list-style-type: none"> <li>• IP20 rated</li> <li>• Install external EMC filters to the drive input to comply with C2 levels of the EN 61800-3 EMC directive.</li> <li>• Provides electrical noise mitigation on the input side of the drive.</li> </ul>
DC Bus Reactor	<ul style="list-style-type: none"> <li>• Improves the drive input power factor.</li> <li>• Prevents damage to the drive when the power supply capacity is large. Use this option when the power supply capacity is more than 600 kVA.</li> <li>• Decreases harmonic current</li> <li>• Improves the power supply total power factor.</li> </ul>
AC Reactor	<ul style="list-style-type: none"> <li>• Improves the drive input power factor.</li> <li>• Prevents damage to the drive when the power supply capacity is large. Use this option when the power supply capacity is more than 600 kVA.</li> <li>• Decreases harmonic current</li> <li>• Improves the power supply total power factor.</li> </ul>
3% Braking Resistor	Dissipates the regenerative energy of the motor and decrease the deceleration time (Duty cycle of 3% ED). An installation attachment is required.
10% Braking Resistor Unit	Dissipates the regenerative energy of the motor and decrease the deceleration time (Duty cycle of 10% ED). The unit contains a thermal overload relay.
Braking Unit	Use with a braking resistor unit to decrease motor deceleration times.
R1000	The R1000 regenerative module is used to divert energy generated by the motor back onto the line for use by other loads. The energy is directed back onto the line by taking DC voltage from the drive running the motor and converting it into a three-phase AC voltage waveform.
Single-Phase Converter	The Single Phase Converter is used in single-phase to three-phase conversion applications to eliminate drive derating. The Single Phase Converter significantly reduces stresses on the power grid with near unity power factor and less than 10% iTHD.

#### Additional Information

[GA500 Power Options](#)

## EMC Filters



Provides electrical noise mitigation on the input side of the drive.

Table 34: 240 V, Single-Phase EMC Filters

Catalog Code GA50...	Part Number
B001A**	FS23638-10-07
B002A**	FS23638-10-07
B004A**	FS23638-10-07
B006A**	FS23638-20-07
B010A**	FS23638-20-07
B012A**	FS23638-30-07
B018A**	FS23638-40-07

Table 35: 240 V, Three-Phase EMC Filters

Catalog Code GA50...	Part Number
2001A**	FS23637-8-07
2002A**	FS23637-8-07
2004A**	FS23637-8-07
2006A**	FS23637-8-07
2010A**	FS23637-14-07
2012A**	FS23637-14-07
2021A**	FS23637-24-07
2030A**	FS5973-35-07
2042A**	FS5973-60-07
2056A**	FS5973-100-07
2070A**	FS5973-100-07
2082A**	Contact Factory

Table 36: 480 V, Three-Phase EMC Filters

Catalog Code GA50...	Part Number
4001A**	FS23639-5-07
4002A**	FS23639-5-07
4004A**	FS23639-5-07
4005A**	FS23639-10-07
4007A**	FS23639-10-07
4009A**	FS23639-10-07
4012A**	FS23639-15-07
4018A**	FS5972-35-07
4023A**	FS5972-35-07
4031A**	FS5972-60-07
4038A**	FS5972-60-07
4044A**	Contact Factory
4060A**	

## EMC Filter Dimensions

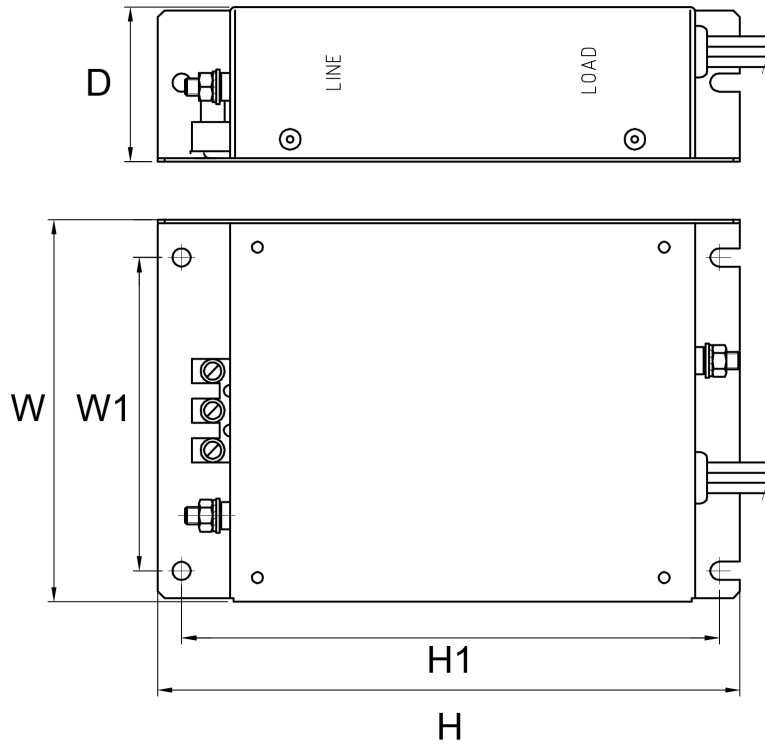


Table 37: EMC Filter Dimensions

Dimensions (mm)						
Model Number #	H	W	D	H1	W1	Wight (lbs)
FS23638-10-07	169	71	45	156	51	0.97
FS23638-20-07	169	111	50	156	91	1.76
FS23638-30-07	174	144	50	161	120	2.64
FS23638-40-07	174	174	50	161	150	3.52
FS23637-8-07	169	71	40	156	51	.88
FS23637-14-07	169	111	45	156	91	1.28
FS23637-24-07	174	144	50	161	120	1.98
FS5973-35-07	330	141	46	313	115	3.09
FS5973-60-07	335	206	60	336	175	6.61
FS5973-100-07	408	236	80	390	205	10.8
FS23639-5-07	169	111	45	156	91	1.1
FS23639-10-07	169	111	45	156	91	1.54
FS23639-15-07	174	144	50	161	120	1.98
FS5972-35-07	335	206	50	336	175	4.63
FS5972-60-07	408	236	65	390	205	8.82



## DC Bus Reactors



Use a DC Bus Reactor on the DC bus terminals of a drive to reduce the effect of line-side transients and input current total harmonic distortion (THD). The DC bus reactor is available loose in a separate UL Type 1 enclosure.

Table 38: 240 V, Three-Phase DC Bus Reactors

HP	Catalog Code GA50U . .		3% DC Bus Reactor		5% DC Bus Reactor	
	Normal Duty	Heavy Duty	Open Type	Enclosed UL Type 1	Open Type	Enclosed UL Type 1
			Part Number	Part Number	Part Number	Part Number
1/6	2001...	2001...	URX000042	URX000216	URX000039	URX000215
1/4	2002...	2002...	URX000041	URX000207	URX000042	URX000216
1/2	2004...	2004...	URX000041	URX000207	URX000041	URX000207
3/4	2004...	2006...	URX000041	URX000207	URX000041	URX000207
1	2006...	2006...	05P00620-0111	URX000208	05P00620-0111	URX000208
1.5	2006...	2010...	05P00620-0111	URX000208	05P00620-0111	URX000208
2	2010...	2010...	05P00620-0110	URX000257	05P00620-0111	URX000208
3	2010...	2012...	05P00620-0110	URX000257	05P00620-0110	URX000257
4	2012...	2021...	URX000371	URX000258	05P00652-0213	URX000209
5	2021...	2021...	05P00620-0115	URX000259	05P00652-0216	URX000220
7.5	2021...	2030...	URX000053	URX000212	URX000052	URX000211
10	2030...	2042...	URX000055	URX000223	URX000055	URX000223
15	2042...	2056...	URX000059	URX000262	URX000057	URX000184
20	2056...	2070...	URX000064	URX000213	URX000064	URX000213
25	2070...	2082...	URX000068	URX000214	URX000073	URX000265
30	2082...	N/A	URX000072	URX000266	URX000073	URX000265

Table 39: 480 V, Three-Phase DC Bus Reactors

HP	Catalog Code GA50U . .		3% DC Bus Reactor		5% DC Bus Reactor	
	Normal Duty	Heavy Duty	Open Type	Enclosed UL Type 1	Open Type	Enclosed UL Type 1
			Part Number	Part Number	Part Number	Part Number
1/2	4001...	4001...	URX000039	URX000215	URX000039	URX000215
3/4	4002...	4002...	URX000042	URX000216	URX000039	URX000215
1	4002...	4002...	URX000042	URX000216	URX000039	URX000215
1.5	4004...	4004...	05P00620-0109	URX000217	URX000042	URX000216
2	4004...	4004...	05P00620-0109	URX000217	URX000042	URX000216
3	4005...	4005...	URX000044	URX000218	URX000042	URX000216
3	4005...	4007...	05P00620-0111	URX000208	URX000044	URX000218
4	4007...	4009...	05P00620-0111	URX000208	URX000044	URX000218
5	4009...	4012...	05P00620-0111	URX000208	URX000044	URX000218
7.5	4012...	4018...	URX000046	URX000219	URX000046	URX000219
10	4018...	4018...	05P00652-0216	URX000220	URX000049	URX000260
10	4018...	4023...	URX000052	URX000211	URX000054	URX000224
15	4023...	4031...	URX000052	URX000211	URX000054	URX000224
20	4031...	4038...	URX000056	URX000221	URX000056	URX000221
25	4038...	4044...	URX000058	URX000225	URX000058	URX000225
30	4044...	4060...	URX000057	URX000184	URX000058	URX000225
40	4060...	N/A	URX000073	URX000265	URX000071	N/A

## Open Type DC Bus Reactor Dimensions

Figure 4:

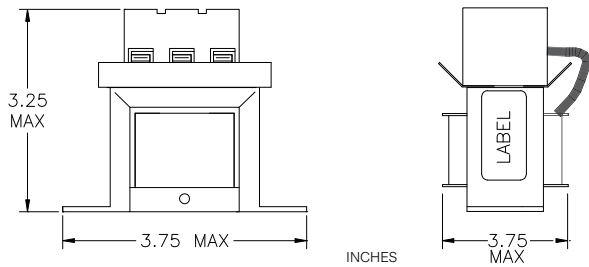


Figure 5:

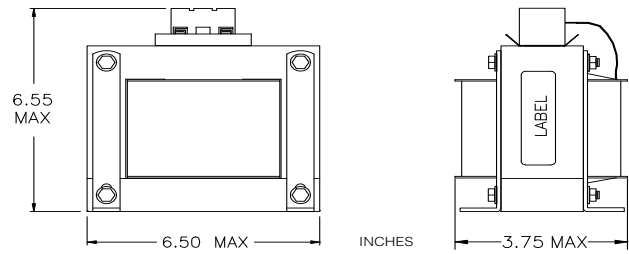


Figure 6:

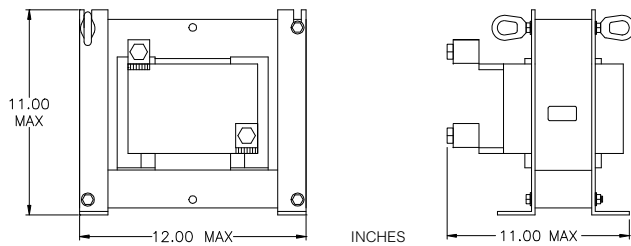
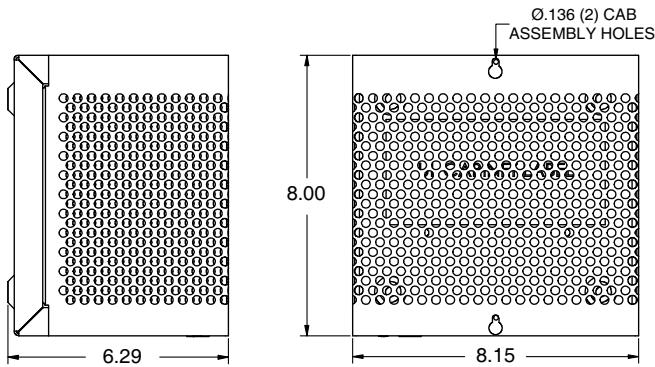


Table 40: Open Type DC Reactor Dimensions

DC Bus Reactor	Figure	DC Bus Reactor	Figure
05P00620-0109	4	URX000053	5
05P00620-0110	4	URX000054	5
05P00620-0111	5	URX000055	5
05P00620-0115	5	URX000056	5
05P00652-0213	5	URX000057	5
05P00652-0216	5	URX000058	5
URX000039	4	URX000059	5
URX000041	4	URX000064	5
URX000042	5	URX000068	6
URX000044	5	URX000071	6
URX000046	5	URX000072	6
URX000048	5	URX000073	6
URX000049	5	URX000371	5
URX000052	5		

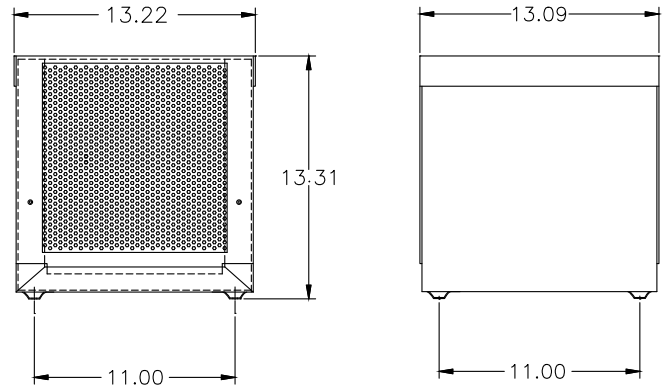
## Enclosed DC Reactor Dimensions

Figure 7: CAB-8



UNITS: INCHES

Figure 8: CAB-13V



UNITS: INCHES

Table 41: Enclosed UL Type 1 DC Reactor Dimensions

DC Bus Reactor	Figure	DC Bus Reactor	Figure
URX000184	7	URX000219	7
URX000207	7	URX000220	7
URX000208	7	URX000221	7
URX000209	7	URX000223	8
URX000210	7	URX000224	8
URX000211	7	URX000225	8
URX000212	7	URX000257	7
URX000213	8	URX000258	7
URX000214	8	URX000259	7
URX000215	7	URX000260	8
URX000216	7	URX000262	7
URX000217	7	URX000265	8
URX000218	7	URX000266	8

## AC Input Reactors



3% and 5% impedance reactors may be used on either the input or output to reduce the effects of line or load side transients on the drive. The reactors listed are available loose or in a separate UL Type 1 enclosure.

Table 42: 240 V, Single-Phase, AC Input Reactors

HP	Catalog Code GA50U . .		3% input Reactor		5% input Reactor	
	Normal Duty	Heavy Duty	Open Type	Enclosed UL Type 1	Open Type	Enclosed UL Type 1
			Part Number	Part Number	Part Number	Part Number
1/6	B001...	B001...	URX000291	URX000651	URX000292	URX000502
1/4	B002...	B002...	URX000299	URX000410	URX000300	URX000503
1/2	B004...	B004...	URX000303	URX000411	URX000304	URX000504
3/4	B004...	B006...	URX000303	URX000411	URX000304	URX000504
1	B006...	B006...	URX000307	URX000413	URX000308	URX000414
1.5	B006...	B010...	URX000307	URX000413	URX000308	URX000414
2	B010...	B010...	URX000315	URX000418	URX000316	URX000419
3	B010...	B012...	URX000315	URX000418	URX000316	URX000419
4	N/A	B018...	URX000319	URX000420	URX000320	URX000421
5	N/A	B018...	URX000319	URX000420	URX000320	URX000421

Table 43: 240 V, Three-Phase, AC Input Reactors

HP	Catalog Code GA50U . .		3% input Reactor		5% input Reactor	
	Normal Duty	Heavy Duty	Open Type	Enclosed UL Type 1	Open Type	Enclosed UL Type 1
			Part Number	Part Number	Part Number	Part Number
1/6	2001...	2001...	URX000283	URX000652	URX000284	URX000585
1/4	2002...	2002...	URX000291	URX000651	URX000292	URX000502
1/2	2004...	2004...	URX000295	URX000409	URX000296	URX000584
3/4	2004...	2006...	URX000295	URX000409	URX000296	URX000584
1	2006...	2006...	URX000299	URX000410	URX000300	URX000503
1.5	2006...	2010...	URX000299	URX000410	URX000300	URX000503
2	2010...	2010...	URX000303	URX000411	URX000304	URX000504
3	2010...	2012...	URX000307	URX000413	URX000308	URX000414
4	2012...	2021...	URX000307	URX000413	URX000308	URX000414
5	2021...	2021...	URX000307	URX000413	URX000308	URX000414
7.5	2021...	2030...	URX000315	URX000418	URX000316	URX000419
10	2030...	2042...	URX000319	URX000420	URX000320	URX000421
15	2042...	2056...	URX000323	URX000422	URX000324	URX000423
20	2056...	2070...	URX000329	URX000501	URX000330	URX000553
25	2070...	2082...	URX000332	URX000426	URX000333	URX000554
30	2082...	N/A	URX000335	URX000427	URX000336	URX000555

Table 44: 480 V, Three-Phase, AC Input Reactor

HP	Catalog Code GA50U . .		3% input Reactor		5% input Reactor	
	Normal Duty	Heavy Duty	Open Type	Enclosed UL Type 1	Open Type	Enclosed UL Type 1
			Part Number	Part Number	Part Number	Part Number
1/2	4001...	4001...	URX000280	URX000653	URX000281	URX000654
3/4	4002...	4002...	URX000288	URX000551	URX000289	URX000571
1	4002...	4004...	URX000288	URX000551	URX000289	URX000571
1.5	4004...	4004...	URX000288	URX000551	URX000289	URX000571
2	4004...	4004...	URX000296	URX000584	URX000297	URX000573
3	4005...	4005...	URX000300	URX000503	URX000301	URX000552
3	4005...	4007...	URX000304	URX000504	URX000305	URX000574
4	4007...	4009...	URX000304	URX000504	URX000305	URX000574
5	4009...	4012...	URX000304	URX000504	URX000305	URX000574
7.5	4012...	4018...	URX000308	URX000414	URX000309	URX000505
10	4018...	4018...	URX000312	URX000416	URX000313	URX000417
10	4023...	4023...	URX000316	URX000419	URX000317	URX000568
15	4023...	4031...	URX000316	URX000419	URX000317	URX000568
20	4031...	4038...	URX000320	URX000421	URX000321	URX000575
25	4038...	4044...	URX000320	URX000421	URX000321	URX000575
30	4044...	4060...	URX000324	URX000423	URX000325	URX000576
40	4060...	N/A	URX000327	URX000425	URX000328	URX000577

## AC Output Reactors



Output impedance reactors may be used to reduce the effects of load side transients on the drive. The reactors listed are available loose or in a separate UL Type 1 enclosure.

Table 45: 240 V, Single-Phase, AC Output Reactors

HP	Catalog Code GA50U . .		3% Output Reactor	
	Normal Duty	Heavy Duty	Open Type	Enclosed UL Type 1
			Catalog Code	Catalog Code
1/6	B001...	B001...	URX000080	URX000243
1/4	B002...	B002...	URX000080	URX000243
1/2	B004...	B004...	05P00620-0017	05P00620-0020
3/4	B004...	B006...	05P00620-0017	05P00620-0020
1	B006...	B006...	05P00620-0024	05P00620-0027
1.5	B006...	B010...	05P00620-0024	05P00620-0027
2	B010...	B010...	05P00620-0134	05P00620-0032
3	B010...	B012...	05P00620-0134	05P00620-0032
4	N/A	B018...	05P00620-0134	05P00620-0032
5	N/A	B018...	05P00620-0136	05P00620-0036



Table 46: 240 V, Three-Phase, AC Output Reactors

HP	Catalog Code GA50U . .		3% Output Reactor	
	Normal Duty	Heavy Duty	Open Type	Enclosed UL Type 1
			Catalog Code	Catalog Code
1/6	2001...	2001...	URX000080	URX000243
1/4	2002...	2002...	URX000080	URX000243
1/2	2004...	2004...	05P00620-0017	05P00620-0020
3/4	2004...	2006...	05P00620-0017	05P00620-0020
1	2006...	2006...	05P00620-0024	05P00620-0027
1.5	2006...	2010...	05P00620-0024	05P00620-0027
2	2010...	2010...	05P00620-0024	05P00620-0027
3	2010...	2012...	05P00620-0134	05P00620-0032
4	2012...	2021...	05P00620-0134	05P00620-0032
5	2021...	2021...	05P00620-0136	05P00620-0036
7.5	2021...	2030...	URX000083	05P00620-0041
10	2030...	2042...	05P00620-0044	05P00620-0046
15	2042...	2056...	05P00620-0140	05P00620-0050
20	2056...	2070...	05P00620-0141	05P00620-0054
25	2070...	2082...	05P00620-0143	05P00620-0058
30	2082...	N/A	URX000085	URX000204

Table 47: 480 V, Three-Phase, AC Output Reactors

HP	Catalog Code GA50U . .		3% Output Reactor	
	Normal Duty	Heavy Duty	Open Type	Enclosed UL Type 1
			Catalog Code	Catalog Code
1/2	4001...	4001...	URX000078	URX000242
3/4	4002...	4002...	05P00620-0131	05P00620-0015
1	4002...	4004...	05P00620-0131	05P00620-0015
1.5	4004...	4004...	05P00620-0132	05P00620-0021
2	4004...	4004...	05P00620-0132	05P00620-0021
3	4005...	4005...	05P00620-0025	05P00620-0029
3	4005...	4007...	05P00620-0133	05P00620-0028
4	4007...	4009...	05P00620-0133	05P00620-0028
5	4009...	4012...	05P00620-0133	05P00620-0028
7.5	4012...	4018...	05P00620-0135	05P00620-0033
10	4018...	4018...	05P00620-0137	05P00620-0037
10	4023...	4023...	05P00620-0138	05P00620-0042
15	4023...	4031...	05P00620-0138	05P00620-0042
20	4031...	4038...	05P00620-0139	05P00620-0047
25	4038...	4044...	05P00620-0139	05P00620-0047
30	4044...	4060...	05P00620-0049	05P00620-0051
40	4060...	N/A	05P00620-0142	05P00620-0055

## AC Open Reactor Dimensions & Weights

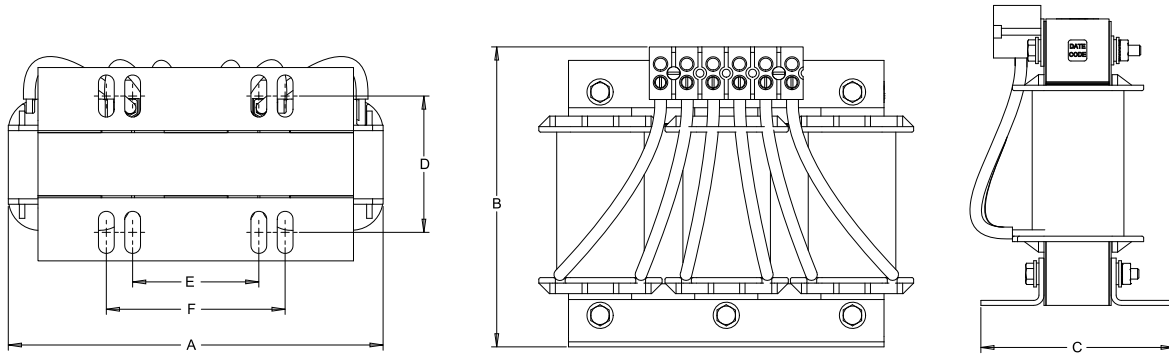


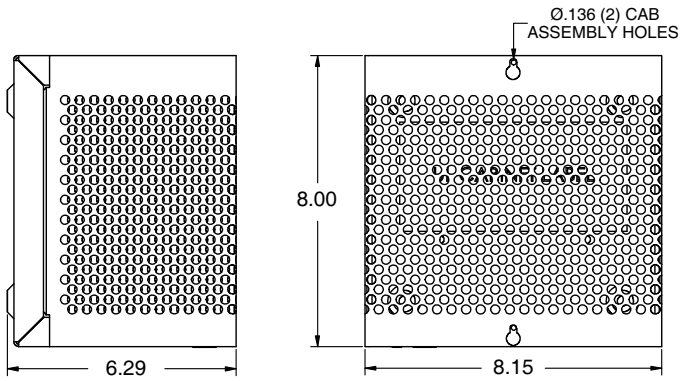
Table 48: AC Open Reactor Dimensions

Open Type Reactor Catalog Code	Watt Loss	Dimensions (mm/in)						Weight
		A	B	C	D	E	F	kg/lb
05P00620-0017	14.5	106.7/4.2	101.6/4	66/2.6	50/2	37/1.4	65/2.6	1.8/4
05P00620-0024	19.5	149.9/5.9	116.8/4.6	73.7/2.9	53/2.1	51/2	76.2/3	3.2/7
05P00620-0025	25.3	149.9/5.9	119.4/4.7	83.8/3.3	67/2.6	51/2	76.2/3	43596
05P00620-0044	49	180.3/7.1	144.8/5.7	94/3.7	66/2.6	76/3	76.2/3	6.4/14
05P00620-0049	62	226.1/8.9	182.9/7.2	116.8/4.6	80/3.2	76/3	108/4.3	11.8/26
05P00620-0131	7.5	106.7/4.2	101.6/4	66/2.6	50/2	37/1.4	65/2.6	1.8/4
05P00620-0132	20	106.7/4.2	101.6/4	66/2.6	50/2	37/1.4	65/2.6	1.8/4
05P00620-0133	29	149.9/5.9	116.8/4.6	73.7/2.9	53/2.1	51/2	76.2/3	3.6/8
05P00620-0134	26	149.9/5.9	127/5	81.3/3.2	53/2.1	51/2	76.2/3	4.1/9
05P00620-0135	31	149.9/5.9	127/5	81.3/3.2	53/2.1	51/2	76.2/3	4.5/10
05P00620-0136	36	149.9/5.9	129.5/5.1	81.3/3.2	54/2.1	51/2	76.2/3	4.1/9
05P00620-0137	43	149.9/5.9	129.5/5.1	88.9/3.5	63/2.5	51/2	76.2/3	5.4/12
05P00620-0138	52	180.3/7.1	147.3/5.8	86.7/3.4	60/2.4	76/3	76.2/3	6.4/14
05P00620-0139	54	180.3/7.1	147.3/5.8	94/3.7	70/2.8	76/3	76.2/3	7.3/16
05P00620-0140	54	226.1/8.9	180.3/7.1	116.8/4.6	80/3.2	76/3	108/4.3	22 (10)
05P00620-0141	64	228.6/9	175.3/6.9	134.6/5.3	80/3.2	76/3	108/4.3	10.9/24
05P00620-0142	67	228.6/9	175.3/6.9	134.6/5.3	80/3.2	76/3	108/4.3	11.8/26
05P00620-0143	82	226.1/8.9	175.3/6.9	144.8/5.7	88/3.5	92/3.63	108/4.3	11.3/25
URX000078	8	111.8/4.4	104.1/4.1	71.1/2.8	50/2	37/1.4	65/2.6	1.4/3
URX000080	10.7	106.7/4.2	101.6/4	66/2.6	44/1.7	37/1.4	65/2.6	1.4/3
URX000083	48	180.3/7.1	144.8/5.7	86.7/3.4	60/2.4	76/3	76.2/3	43596
URX000085	94	226.1/8.9	177.8/7	152.4/6	88/3.5	92/3.62	108/4.3	13.2/29
URX000280	6.6	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000281	8.8	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000283	4.8	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000284	7.8	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000288	10.9	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000289	15	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2

Open Type Reactor Catalog Code	Watt Loss	Dimensions (mm/in)						Weight
		A	B	C	D	E	F	kg/lb
URX000291	9	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000292	14.3	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000295	12.3	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000296	19.6	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000297	26.5	106.7/4.2	101.6/4	66/2.6	48.3/1.9	35.6/1.4	66/2.6	1.4/3
URX000299	13.8	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000300	23	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000301	37.5	106.7/4.2	101.6/4	66/2.6	48.3/1.9	35.6/1.4	66/2.6	1.4/3
URX000303	19.2	114.3/4.5	94/3.7	38.1/1.5	N/A	N/A	101.6/4	0.9/2
URX000304	37.2	106.7/4.2	101.6/4	66/2.6	48.3/1.9	35.6/1.4	66/2.6	1.4/3
URX000305	47.8	106.7/4.2	101.6/4	76.2/3	58.4/2.3	35.6/1.4	66/2.6	1.8/4
URX000307	26.8	106.7/4.2	104.1/4.1	66/2.6	48.3/1.9	35.6/1.4	66/2.6	1.4/3
URX000308	40.9	106.7/4.2	104.1/4.1	66/2.6	48.3/1.9	35.6/1.4	66/2.6	1.8/4
URX000309	54.4	106.7/4.2	104.1/4.1	83.8/3.3	63.5/2.5	35.6/1.4	66/2.6	2.3/5
URX000311	32.7	106.7/4.2	104.1/4.1	66/2.6	48.3/1.9	35.6/1.4	66/2.6	1.4/3
URX000312	48.2	106.7/4.2	104.1/4.1	76.2/3	58.4/2.3	35.6/1.4	66/2.6	1.8/4
URX000313	60.6	149.9/5.9	119.4/4.7	73.7/2.9	53.3/2.1	50.8/2	76.2/3	3.2/7
URX000315	38.3	106.7/4.2	132.1/5.2	76.2/3	58.4/2.3	35.6/1.4	66/2.6	1.8/4
URX000316	57.4	149.9/5.9	152.4/6	73.7/2.9	53.3/2.1	50.8/2	76.2/3	3.2/7
URX000317	73.5	149.9/5.9	152.4/6	83.8/3.3	63.5/2.5	50.8/2	76.2/3	4.5/10
URX000319	48.2	106.7/4.2	55.9/2.2	83.8/3.3	63.5/2.5	35.6/1.4	66/2.6	2.3/5
URX000320	66.8	149.9/5.9	152.4/6	83.8/3.3	63.5/2.5	50.8/2	76.2/3	4.5/10
URX000321	93.8	149.9/5.9	152.4/6	83.8/3.3	63.5/2.5	50.8/2	76.2/3	4.5/10
URX000323	69	149.9/5.9	152.4/6	88.9/3.5	71.1/2.8	50.8/2	76.2/3	4.5/10
URX000324	103	180.3/7.1	147.3/5.8	94/3.7	68.6/2.7	N/A	76.2/3	5.9/13
URX000325	122	180.3/7.1	147.3/5.8	106.7/4.2	81.3/3.2	N/A	76.2/3	8.2/18
URX000327	100	180.3/7.1	144.8/5.7	106.7/4.2	81.3/3.2	N/A	76.2/3	7.7/17
URX000328	179	226.1/8.9	210.8/8.3	116.8/4.6	81.3/3.2	76.2/3	109.2/4.3	10.9/24
URX000329	68	180.3/7.1	139.7/5.5	124.5/4.9	81.3/3.2	N/A	76.2/3	8.2/18
URX000330	110	180.3/7.1	142.2/5.6	142.2/5.6	81.3/3.2	N/A	76.2/3	9.1/20
URX000332	87	180.3/7.1	142.2/5.6	127/5	81.3/3.2	N/A	76.2/3	8.2/18
URX000333	105	180.3/7.1	144.8/5.7	152.4/6	81.3/3.2	N/A	76.2/3	18 (8.2)
URX000335	119	180.3/7.1	142.2/5.6	149.9/5.9	81.3/3.2	N/A	76.2/3	8.6/19
URX000336	155	226.1/8.9	180.3/7.1	147.3/5.8	81.3/3.2	76.2/3	109.2/4.3	11.8/26

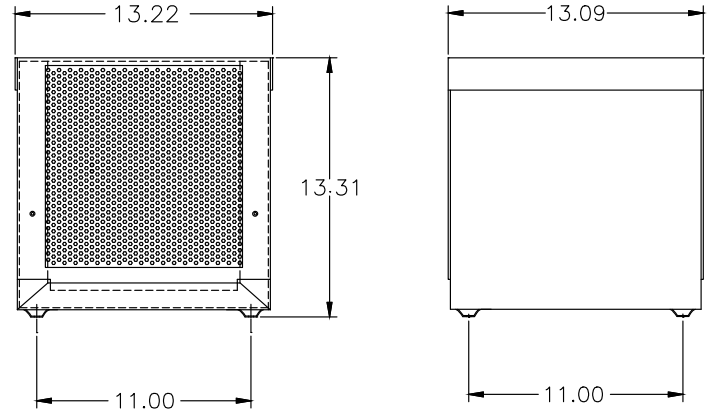
## Enclosed AC Reactor Dimensions

Figure 9: CAB-8



UNITS: INCHES

Figure 10: CAB-13V



UNITS: INCHES

Table 49: Enclosed, Input/Output AC Reactor Specifications

Enclosed UL Type 1 Reactor Catalog Code	Cabinet Reference (Figure)	Weight kg/lb
05P00620-0015	10	12.7 / 28
05P00620-0020		12.9 / 28.4
05P00620-0021		16.3 / 36
05P00620-0027		19.1 / 42
05P00620-0028		17.2 / 38
05P00620-0029		18.1 / 40
05P00620-0032		20 / 44
05P00620-0033		24.9 / 55
05P00620-0036		3.9 / 8.5
05P00620-0037		3.9 / 8.6
05P00620-0041	3.9 / 8.5	
05P00620-0042	3.9 / 8.6	
05P00620-0046	3.9 / 8.6	
05P00620-0047	3.9 / 8.5	
05P00620-0050	3.9 / 8.6	
05P00620-0051	4.4 / 9.7	
05P00620-0054	4.4 / 9.8	
05P00620-0055	5 / 11.1	
05P00620-0058	3.9 / 8.5	
URX000204	9	3.9 / 8.5
URX000242		4.6 / 10
URX000243		5 / 10
URX000409		3.9 / 8.6
URX000410		3.9 / 8.7
URX000411		4 / 8.8
URX000413		4.4 / 9.7
URX000414		5.1 / 11.2
URX000415		4.4 / 9.8
URX000416		5.1 / 11.3
URX000417	6.4 / 14.1	
URX000418	10	10.1 / 22.2
URX000419		11.4 / 25.2
URX000420		10.5 / 23.1
URX000421		12.5 / 27.5
URX000422		12.7 / 28
URX000423		14.1 / 31
URX000425		15.9 / 35
URX000426		16.3 / 36
URX000427		16.8 / 37
URX000501		16.3 / 36

Enclosed UL Type 1 Reactor Catalog Code	Cabinet Reference (Figure)	Weight kg/lb
URX000502	9	3.9 / 8.6
URX000503		4 / 8.8
URX000504		4.4 / 9.8
URX000505		5.6 / 12.3
URX000551		3.9 / 8.6
URX000552		4.4 / 9.8
URX000553	10	17.2 / 38
URX000554		18.1 / 40
URX000555		20 / 44
URX000568		12.7 / 28
URX000571	9	3.9 / 8.6
URX000573		4.4 / 9.7
URX000574		5 / 11.1
URX000575	10	12.9 / 28.4
URX000576		16.3 / 36
URX000577		19.1 / 42
URX000584	9	3.9 / 8.6
URX000585		3.9 / 8.6
URX000651		3.9 / 8.5
URX000652		3.9 / 8.5
URX000653		3.9 / 8.5
URX000654		3.9 / 8.5

## Dynamic Braking Options



Additional Information	
<a href="#">Braking Resistor Specifications</a>	<a href="#">Braking Resistor Drawings</a>
<a href="#">Braking Connection Diagrams</a>	

## 10% Dynamic Braking Options

Dynamic Braking Resistor, 10% Duty Cycle - are rated for 10% duty cycle over a 100 second interval. The resistors will achieve a minimum 150% peak braking torque for heavy duty horsepower ratings and a minimum of 100% peak braking power for normal duty horsepower ratings. These resistors are designed for separate panel mounting.

Table 50: 240 V, Single-Phase, 10% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA50U . .	10% Dynamic Braking Option (max 10 second on-time)	
			Resistor	
			Catalog Code	Quantity
1/6	1/6	B001...	USR000032	1
1/4	1/4	B002...	USR000033	1
3/4	1/2	B004...	USR000022	1
1.5	1	B006...	USR000035	1
3	2	B010...	USR000024	1
3	3	B012...	USR000024	1
N/A	5	B018...	USR000025	1



Table 51: 240 V, Three-Phase, 10% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA50U . .	10% Dynamic Braking Option (max 10 second on-time)	
			Resistor	
			Catalog Code	Quantity
1/6	1/6	2001...	USR000032	1
1/4	1/4	2002...	USR000033	1
3/4	1/2	2004...	USR000022	1
1.5	1	2006...	USR000035	1
3	2	2010...	USR000024	1
4	3	2012...	USR000024	1
7.5	5	2021...	USR000025	1
10	7.5	2030...	URS000148	1
15	10	2042...	URS000140	1
20	15	2056...	URS000136	1
25	20	2070...	URS000136	1
30	25	2082...	URS000136	1

Table 52: 480 V, Three-Phase, 10% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA50U . .	10% Dynamic Braking Option (max 10 second on-time)	
			Resistor	
			Catalog Code	Quantity
1/2	1/2	4001...	USR000032	1
1	3/4	4002...	USR000032	1
2	2	4004...	USR000032	1
3	3	4005...	USR000034	1
4	3	4007...	USR000034	1
5	4	4009...	USR000035	1
7.5	5	4012...	USR000036	1
10	10	4018...	USR000038	1
15	10	4023...	USR000038	1
20	15	4031...	USR000039	1
25	20	4038...	URS000154	1
30	25	4044...	URS000154	1
40	30	4060...	USR000066	1

Dimension Drawings

DD.GCE.01

Figure 11: GCE Type Enclosure

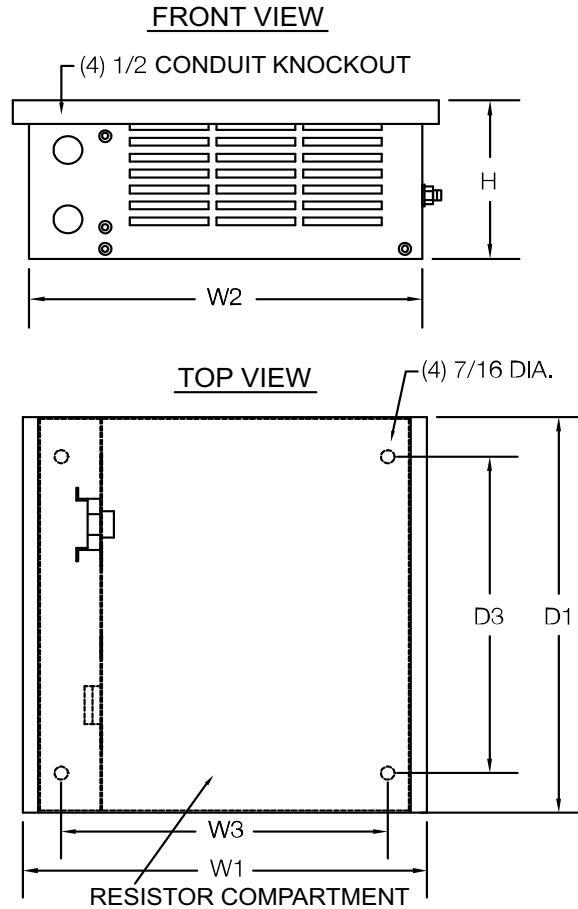
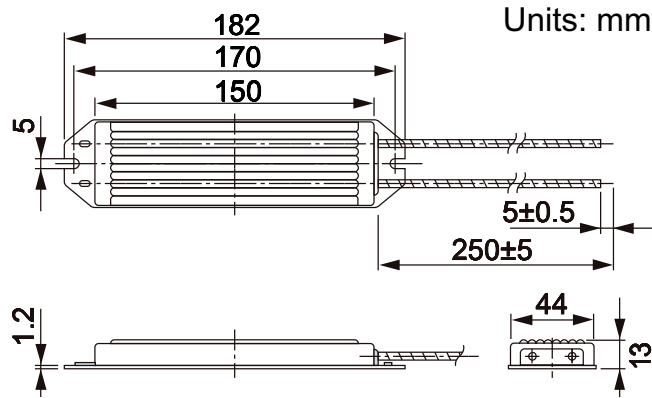


Table 53: GCE Type Enclosure Dimensions

Model	Dimensions (in)						
	W1	W2	W3	D1	D2	D3	H
GCE1	12.5	12	10.5	5.13	5	-	5
GCE2	12.5	12	10.5	7.13	7	4.5	5
GCE3	12.5	12	10.5	10.13	10	7.5	5
GCE4	12.5	12	10.5	13.13	13	10.5	5
GCE5	12.5	12	10.5	16.13	16	13.5	5
GCE6	19.5	19	17.5	10.13	10	7.5	5
GCE8	19.5	19	17.5	13.13	13	10.5	5
GCE9	27	26.5	25	10.125	10	7.5	5

## 3% Dynamic Braking Options

3% Duty cycle resistors are rated for a 3% duty cycle at 100 second intervals.



**ERF-150WJ series**  
**Weight: 0.2 kg**  
**(All ERF-150WJ[ ] series models)**

Table 54: 240 V, Single-Phase, 3% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA50U . .	Resistor <sup>1</sup>	
			Catalog Code	Quantity
1/6	1/6	B001...	R7508	1
1/4	1/4	B002...	R7507	1
3/4	1/2	B004...	R7506	1
1.5	1	B006...	R7505	1
3	2	B010...	R7504	1
3	3	B012...	R7510	1
N/A	5	B018...	R7510	2

1. These resistors offer approximately 100% peak braking power.

Table 55: 240 V, Three-Phase, 3% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA50U . .	Resistor <sup>1</sup>	
			Catalog Code	Quantity
1/6	1/6	2001...	R7508	1
1/4	1/4	2002...	R7507	1
3/4	1/2	2004...	R7506	1
1.5	1	2006...	R7505	1
2	1.5	2010...	R7504	1
3	2	2010...	R7504	1
4	3	2012...	R7510	1
5	4	2021...	R7510	2
7.5	5	2021...	R7510	2

1. These resistors offer approximately 100% peak braking power.

Table 56: 480 V, Three-Phase, 3% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA50U . .	Resistor <sup>1</sup>	
			Catalog Code	Quantity
1/2	1/2	4001	R7508	1
1	3/4	4002	R7508	1
2	2	4004	R7507	1
3	3	4005	R7505	1
4	3	4007	R7505	1
5	4	4009	R7505	1
7.5	5	4012	R7504	1

1. These resistors offer approximately 100% peak braking power.

## R1000 Power Regenerative Unit Kits

The R1000 is a cost-effective line-regeneration solution that replaces braking transistor/resistor networks in high duty cycle braking applications.

The R1000 is ideal for applications that have large overhauling loads or make frequent stops, such as elevators, centrifuges, test stands, and winders.

Additional Information	
<a href="#">R1000 Product Page</a>	<a href="#">Flyer</a>
<a href="#">Drawings</a>	<a href="#">Manual</a>

Each R1000 regenerative unit system requires the following items:

- R1000 Module
- Power Coordination Reactor
- Current Suppression Reactor
- Fuses and Fuse Holder

Convenient, easy to order, Regenerative Kits include all the required peripheral devices pre-selected for the R1000.

Select the Regenerative Kit Number for your application using the following table.

Rated Input Voltage	Regenerative Kit Number	System Capacity	R1000 Model Number in Kit CIMR-RU	Enclosure Type
		Maximum Applicable Motor Capacity [HP] <sup>1</sup>		
240 V	R1000-240-5HP	5	2A03P5FAA	IP20/NEMA 1
	R1000-240-7.5HP	7.5	2A0005FAA	
	R1000-240-10HP	10	2A0007FAA	
	R1000-240-15HP	15	2A0010FAA	
	R1000-240-20HP	20	2A0014FAA	
	R1000-240-25HP	25	2A0017FAA	
	R1000-240-30HP	30	2A0020FAA	
	R1000-240-40HP	40	2A0028FAA	
	R1000-240-50HP	50	2A0035AAA	IP00/Protected Chassis
	R1000-240-75HP	75	2A0053AAA	
	R1000-240-100HP	100	2A0073AAA	
	R1000-240-150HP	150	2A0105AAA	

Rated Input Voltage	Regenerative Kit Number	System Capacity	R1000 Model Number in Kit CIMR-RU	Enclosure Type
		Maximum Applicable Motor Capacity [HP] <sup>1</sup>		
480 V	R1000-480-5HP	5	4A03P5FAA	IP20/NEMA 1
	R1000-480-7.5HP	7.5	4A0005FAA	
	R1000-480-10HP	10	4A0007FAA	
	R1000-480-15HP	15	4A0010FAA	
	R1000-480-20HP	20	4A0014FAA	
	R1000-480-25HP	25	4A0017FAA	
	R1000-480-30HP	30	4A0020FAA	
	R1000-480-40HP	40	4A0028FAA	
	R1000-480-50HP	50	4A0035AAA	IP00/Protected Chassis
	R1000-480-60HP	60	4A0043AAA	
	R1000-480-75HP	75	4A0053AAA	
	R1000-480-100HP	100	4A0073AAA	
	R1000-480-150HP	150	4A0105AAA	
	R1000-480-250HP	250	4A0150AAA	
	R1000-480-350HP	350	4A0210AAA	
	R1000-480-500HP	500	4A0300AAA	

1. Rated output capacity is based on standard duty ratings (100% for 60 sec, 25% duty cycle)

## R1000 Power Regenerative Units

Each R1000 regenerative unit system requires the following items:

- R1000 Module
- Power Coordination Reactor
- Current Suppression Reactor
- Fuses and Fuse Holder

## R1000 Model Selection 200 to 240 V

**R1000 Power Regenerative Unit** 3.5 to 105 kW, 200 to 240 V, 3-phase input, IP20/NEMA 1 or IP00/Protected Chassis. Each R1000 requires a corresponding set of input fuses/holders, power coordinating reactor, and current suppression reactor. Always install the specified devices. The R1000 does not require an external MOV to be UL compliant.

Capacity kW (HP)	R1000 Power Regenerative Unit		Current Suppression Reactor	Power Coordination Reactor	Fuses (Quantity 3)	Fuse Holder	
	Model Number CIMR-RU	Rated Current Amps <sup>1</sup> 100% / 80%	Part Number Yaskawa (MTE)	Part Number Yaskawa (MTE)	Part Number Yaskawa (Mersen)	Quantity Required	Part Number Yaskawa (Mersen)
3.5 (5)	2A03P5FAA <sup>2</sup>	10/8	05P00620-0134 (RL-01201)	05P00620-0136 (RL-01801)	FU-002031 (A60Q20-2)	1	FU-002055 (30323)
5 (7)	2A0005FAA <sup>2</sup>	15/12	URX000083 (RL-02501)	05P00620-0138 (RL-02502)	FU-002031 (A60Q20-2)	1	FU-002055 (30323)
7 (9)	2A0007FAA <sup>2</sup>	20/16	URX000083 (RL-02501)	05P00620-0044 (RL-03501)	FU-002032 (A60Q30-2)	1	FU-002055 (30323)
10 (13)	2A0010FAA <sup>2</sup>	30/24	05P00620-0044 (RL-03501)	05P00620-0140 (RL-04501)	UFU000153 (A30QS50-4)	3	FU-002082 (P243G)
14 (19)	2A0014FAA <sup>2</sup>	41/33	05P00620-0141 (RL-05501)	05P00620-0141 (RL-05501)	UFU000479 (A30QS60-4)	3	FU-002082 (P243G)
17 (23)	2A0017FAA <sup>2</sup>	50/40	05P00620-0143 (RL-08001)	05P00620-0143 (RL-08001)	UFU000154 (A30QS80-4)	3	FU-002083 (P243)
20 (27)	2A0020FAA <sup>2</sup>	60/48	URX000085 (RL-10001)	05P00620-0143 (RL-08001)	UFU000155 (A30QS100-4)	3	FU-002083 (P243)
28 (38)	2A0028FAA <sup>2</sup>	83/66	URX000085 (RL-10001)	05P00620-0013 (RL-13002)	UFU000156 (A30QS150-4)	3	FU-002083 (P243)
35 (47)	2A0035AAA <sup>3</sup>	102/82	05P00620-0064 (RL-13001)	05P00620-0070 (RL-16002)	UFU000156 (A30QS150-4)	3	FU-002083 (P243)
53 (71)	2A0053AAA <sup>3</sup>	153/122	URX000086 (RL-16001)	05P00620-0146 (RL-20002)	UFU000494 (A30QS200-4)	3	FU-002083 (P243)
73 (98)	2A0073AAA <sup>3</sup>	209/167	URX000175 (RL-25001)	URX000175 (RL-25001)	UFU000375 (170M2620)	3	UFU000378 (170H1007)
105 (141)	2A0105AAA <sup>3</sup>	306/245	URX000178 (RL-32001)	URX000181 (RL-40002)	UFU000376 (170M3021)	3	UFU000122 (170H3003)

1. 100% for 1 min, (25% ED) / 80% continuous, ED = Duty Cycle.#

2. IP20/NEMA 1 enclosure.#

3. IP00/Protected Chassis enclosure.

## R1000 Model Selection 380 to 480 V

**R1000 Power Regenerative Unit** 3.5 to 300 kW, 380 to 480 V, 3-phase input, IP20/NEMA 1 or IP00/Protected Chassis.

Each R1000 requires a corresponding set of input fuses/holders, power coordinating reactor, and current suppression reactor. Always install the specified devices. The R1000 does not require an external MOV to be UL compliant.

Capacity kW (HP)	R1000 Power Regenerative Unit		Current Suppression Reactor	Power Coordination Reactor	Fuses (Quantity 3)	Fuse Holder	
	Model Number CIMR-RU	Rated Current Amps <sup>1</sup> 100% / 80%	Part Number Yaskawa (MTE)	Part Number Yaskawa (MTE)	Part Number Yaskawa (Mersen)	Quantity Required	Part Number Yaskawa (Mersen)
3.5 (5)	4A03P5FAA <sup>2</sup>	5/4	05P00620-0025 (RL-00803)	05P00620-0133 (RL-00802)	FU-002030 (A60Q15-2)	1	FU-002055 (30323)
5 (7)	4A0005FAA <sup>2</sup>	8/6	05P00620-0133 (RL-00802)	05P00620-0135 (RL-01202)	FU-002030 (A60Q15-2)	1	FU-002055 (30323)
7 (9)	4A0007FAA <sup>2</sup>	11/9	05P00620-0135 (RL-01202)	05P00620-0137 (RL-01802)	FU-002030 (A60Q15-2)	1	FU-002055 (30323)
10 (13)	4A0010FAA <sup>2</sup>	16/13	05P00620-0137 (RL-01802)	05P00620-0138 (RL-02502)	FU-002032 (A60Q30-2)	1	FU-002055 (30323)
14 (19)	4A0014FAA <sup>2</sup>	22/18	URX000083 (RL-02501)	05P00620-0139 (RL-03502)	FU-002032 (A60Q30-2)	1	FU-002055 (30323)
17 (23)	4A0017FAA <sup>2</sup>	27/22	05P00620-0044 (RL-03501)	05P00620-0139 (RL-03502)	FU-000783 (A50P50-4)	3	FU-002082 (P243G)
20 (27)	4A0020FAA <sup>2</sup>	32/26	05P00620-0049 (RL-04502)	05P00620-0049 (RL-04502)	FU-000783 (A50P50-4)	3	FU-002082 (P243G)
28 (38)	4A0028FAA <sup>2</sup>	43/34	05P00620-0142 (RL-05502)	05P00620-0142 (RL-05502)	UFU000480 (A50P60-4)	3	FU-002082 (P243G)
35 (47)	4A0035AAA <sup>3</sup>	54/43	05P00620-0144 (RL-08002)	05P00620-0144 (RL-08002)	FU-000806 (A50P80-4)	3	FU-002084 (P243E)
43 (58)	4A0043AAA <sup>3</sup>	66/53	05P00620-0143 (RL-08001)	05P00620-0144 (RL-08002)	FU-000807 (A50P100-4)	3	FU-002084 (P243E)
53 (71)	4A0053AAA <sup>3</sup>	81/65	URX000085 (RL-10001)	05P00620-0145 (RL-10002)	FU-000809 (A50P150-4)	3	FU-002084 (P243E)
73 (98)	4A0073AAA <sup>3</sup>	110/88	05P00620-0064 (RL-13001)	05P00620-0070 (RL-16002)	FU-000809 (A50P150-4)	3	FU-002084 (P243E)
105 (141)	4A0105AAA <sup>3</sup>	161/129	05P00620-0075 (RL-20001)	05P00620-0146 (RL-20002)	UFU000374 (170M1371)	3	UFU000378 (170H1007)
150 (201)	4A0150AAA <sup>3</sup>	237/190	URX000175 (RL-25001)	URX000176 (RL-25002)	UFU000375 (170M2620)	3	UFU000378 (170H1007)
210 (282)	4A0210AAA <sup>3</sup>	326/261	URX000181 (RL-40001)	URX000182 (RL-40002)	UFU000376 (170M3021)	3	UFU000122 (170H3003)
300 (402)	4A0300AAA <sup>3</sup>	466/373	URX000088 (RL-50001)	05P00620-0094 (RL-50002)	UFU000377 (170M4016)	3	UFU000122 (170H3003)

1. 100% for 1 min, (25% ED) / 80% continuous, ED = Duty Cycle.#

2. IP20/NEMA 1 enclosure.#

3. IP00/Protected Chassis enclosure.



## R1000 Power Regenerative Unit Options

### External Heatsink Kits

An External Heatsink Kit lets you mount a drive with the drive's heatsink external (NEMA 1 backside) to the enclosure. Option kit for customer mounting. Larger standard drives include brackets.

Table 57: External Heatsink Kits NEMA 1 for 200 to 240 V Models

Drive Model CIMR-RU	Kit
2A03P5FAA	EZZ020800B
2A0005FAA	
2A0007FAA	
2A0010FAA	EZZ020800C
2A0014FAA	
2A0017FAA	EZZ020800D
2A0020FAA	
2A0028FAA	
0035 ~ 105	Required brackets are included with the drive.

Table 58: External Heatsink Kits NEMA 1 for 380 to 480 V Models

Drive Model CIMR-RU	Kit
4A03P5FAA	EZZ020800B
4A0005FAA	
4A0007FAA	
4A0010FAA	EZZ020800C
4A0014FAA	
4A0017FAA	EZZ020800D
4A0020FAA	
4A0028FAA	
0035 ~ 0300	Required brackets are included with the drive.

## Single-Phase Converter



Yaskawa’s industry leading Single Phase Converter (SPC) cleanly converts single-phase AC power to DC power for Yaskawa variable frequency drives. The SPC combines Yaskawa reliability and drive technology with motor control solutions for businesses in remote areas. The SPC eliminates the need to oversize variable frequency drives for single-phase applications while reducing distortion to less than 10% iTHD. With lower input harmonics and near unity power factor, the SPC also eliminates the need to significantly oversize transformers in single-phase applications, reducing overall installation costs. The Single Phase Converter addresses these common issues with AC motors powered from single-phase input:

- Limited single-phase motor options.
- Inefficient use of power due to choppy current harmonics.
- Increased maintenance of rotating parts and tuned circuits.

Item	Specification
Power Range	230 VAC: 20 - 60 HP
	460 VAC: 30 - 125 HP
Input Voltage Tolerance	230-240 VAC, Single-Phase
	460-480 VAC, Single-Phase
	Tolerance -5/+10 % <sup>1</sup>
Power Factor	0.99
Ambient Operating Temperature	-10 to 50 °C (14 to 122 °F) Open Chassis
Global Certifications	UL, RoHS
User Interface	4 LED indicators: Power, Ready, Run, Fault

1. -10 % Minimum input voltage for 60 seconds at rated power.

Additional Information	
<a href="#">Single Phase Converter Specifications</a>	<a href="#">Manual</a>
	<a href="#">Drawings</a>

Table 59: 240 V, Single-Phase Converters - 20 to 125 HP

System Kit Number	System Capacity		Component Name	Component Catalog Code	
	Maximum Total Motor Load HP (kW)	Maximum Continuous			
		Input Current (Amps)			Output DC Current (Amps)
SPBC-240-20HP	20 (15)	79	57	Single Phase Converter	SPBC-2015AAA
				DC Link Choke	URX000530
SPBC-240-30HP	30 (22)	116	84	Single Phase Converter	SPBC-2022AAA
				DC Link Choke	URX000531
SPBC-240-40HP	40 (30)	154	112	Single Phase Converter	SPBC-2030AAA
				DC Link Choke	URX000532
SPBC-240-50HP	50 (37)	191	139	Single Phase Converter	SPBC-2037AAA
				DC Link Choke	URX000520
SPBC-240-60HP	60 (45)	228	166	Single Phase Converter	SPBC-2045AAA
				DC Link Choke	URX000521

Table 60: 480 V, Single-Phase Converters - 30 to 125 HP

System Kit Number	System Capacity		Component Name	Component Catalog Code	
	Maximum Total Motor Load HP (kW)	Maximum Continuous			
		Input Current (Amps)			Output DC Current (Amps)
SPBC-480-30HP	30 (22)	58	42	Single Phase Converter	SPBC-4022AAA
				DC Link Choke	URX000534
SPBC-480-40HP	40 (30)	77	56	Single Phase Converter	SPBC-4030AAA
				DC Link Choke	URX000535
SPBC-480-50HP	50 (37)	96	69	Single Phase Converter	SPBC-4037AAA
				DC Link Choke	URX000536
SPBC-480-60HP	60 (45)	114	83	Single Phase Converter	SPBC-4045AAA
				DC Link Choke	URX000537
SPBC-480-75HP	75 (56)	142	103	Single Phase Converter	SPBC-4056AAA
				DC Link Choke	URX000527
SPBC-480-125HP	125 (93)	234	170	Single Phase Converter	SPBC-4093AAA
				DC Link Choke	URX000529

# Terms and Conditions

## YASKAWA AMERICA, INC. ("YAI"), DRIVES & MOTION TERMS AND CONDITIONS

### 1. GENERAL: #

(a) All sales of products or services by Yaskawa America, Inc., Drives & Motion Division (hereinafter "D&M"), is governed exclusively by these Terms and Conditions of Sale ("Terms"), which supersede all inconsistent or additional terms on Buyer's purchase order or any other document. These Terms constitute the final, complete and exclusive agreement between the parties as to the subject matter hereof. These Terms may be amended only in writing signed by an authorized representative of D&M. #

(b) Orders must be submitted in the form of a written purchase order or letter from Buyer, setting forth all information necessary for D&M to fill the Order, if accepted. All proposals, quotations or similar communications from D&M are considered invitations to submit an Order. A binding sales contract will result only when D&M accepts Buyer's Order, at D&M's office in Waukegan, Illinois or such other place as designated by D&M.

### 2. PRICES: #

(a) D&M's quoted prices are firm for thirty (30) days from the date of D&M's written proposal. Thereafter, the applicable prices are those in effect at the time Buyer's Order is placed with D&M. D&M will notify Buyer of any price changes for incorporation into a revised Order prior to acceptance by D&M. Pricing based on volume discounts is subject to adjustment by D&M if actual shipping volumes do not meet minimum volume requirements of agreement. Clerical errors in any element of a proposal, purchase order, invoice or contract are subject to correction by D&M.

### 3. TERMS OF PAYMENT: #

(a) All payments are due within thirty (30) days from date of D&M's invoice. Payment shall be made at the agreed time, to the place specified, and in the currency indicated on D&M's invoice. D&M reserves the right to require payment in advance, or satisfactory security, for any shipment or sale. D&M reserves the right to seek any other remedy available at law or equity and Buyer shall be liable for all expenses, including attorneys' fees, relating to the collection of past due amounts. Buyer's default constitutes a waiver of Buyer's right to demand D&M's performance under the contract. #

(b) When an amount becomes past due according to its payment terms, Buyer shall pay interest on the balance due, at the greater of 1.50% per month (18% per annum) or the maximum permitted by law, until paid in full. #

(c) If delivery and/or payment in installments is accepted by D&M, Buyer's failure to pay any installment when due shall give D&M the right to suspend work or delivery until such payment is made. In the event that any such default by Buyer continues for more than fifteen (15) days, D&M may then cancel the contract by written notice to Buyer. #

(d) All duties, tariffs, fees, costs and other charges connected with shipment, insurance, exportation and importation of the products are the responsibility of Buyer, and, if paid by D&M, such expenses may be recovered by D&M from Buyer, and Buyer shall indemnify D&M against claims for the same. Buyer is responsible for all taxes applicable or related to this transaction, including all sales, use and excise taxes.

### 4. SECURITY INTEREST: #

To secure any indebtedness due and owing from Buyer from time to time, Buyer hereby grants to D&M, and D&M hereby reserves, a continuing purchase money security interest in all Yaskawa-brand and other products heretofore or hereafter sold and delivered to Buyer by D&M, and all related parts, components and accessories therefor, and all proceeds arising from the sale or other disposition of the foregoing, including, but not limited to, cash, accounts, contract rights, accounts receivable, instruments and chattel paper. Buyer shall at no time grant any security interest that conflicts with that granted to D&M herein. Buyer shall cooperate with D&M, and hereby appoints D&M as its attorney-in-fact, to execute and file, on Buyer's behalf, any documents necessary to evidence and perfect D&M's security interest. D&M reserves all rights and remedies available to it under the Uniform Commercial Code and other applicable law in the event of Buyer's default.

### 5. SHIPMENT, FORCE MAJEURE, AND ERROR: #

(a) Shipment/delivery dates are approximations only. D&M shall not be liable to pay any penalty or damages, including consequential damages, for any delay in shipment. #

(b) All shipments are F.O.B. D&M's (or its suppliers') manufacturing plant or warehouse. D&M will, at Buyer's expense, arrange for the transportation of the products from the manufacturing plant or warehouse designated by D&M. All products shall be packaged for domestic shipment in accordance with D&M's standard specifications. If special packaging is required, it must be clearly requested on Buyer's Order. The price for any special packaging shall be billed to Buyer. Buyer is responsible to timely procure all necessary export and import licenses and all permits required for the consummation of the transaction and to obtain insurance coverage on all shipments of products supplied by D&M. Risk of loss and/or damage to the products shall pass to Buyer upon delivery thereof to Buyer or its representative, or to a carrier for shipment to Buyer or its designated customer, as the case may be, at the FOB point. #

(c) D&M shall not be liable for any damages, including consequential damages, caused by delays or non-performance resulting from or related to force majeure or other causes beyond D&M's reasonable control, including, but not limited to, war, blockade, civil disturbances, strikes and lockouts, labor shortages, fire and other casualties, acts of nature, accidents and governmental acts (including regulations concerning export and import licensing and currency exchange). In case of non-delivery, D&M's obligation shall be limited to the refund of any advance payment received from Buyer. #

(d) All claims for loss of or damage to products, whether concealed or obvious, must be made, in writing, to the carrier and to D&M by Buyer as soon as possible after receipt of shipment, and in no case beyond 30 days of shipment, or such claims shall be deemed waived. D&M will render reasonable assistance in providing information necessary for Buyer to process such damage claims with the carrier or any insurance company. #

(e) Buyer agrees to accept delivery within fifteen (15) days following the anticipated date of delivery. If Buyer refuses to take delivery within the fifteen (15) day period, D&M reserves the right to charge Buyer for storage charges plus interest.

**6. RETURNS/CANCELLATION CHARGES:#**

Buyer shall not return products to D&M without the written consent of, and upon terms agreed to, by D&M. If Buyer refuses to accept delivery, or improperly revokes acceptance of product, Buyer shall be responsible for D&M's cancellation charges and expenses. Before any returns, a Return Merchandise Authorization ("R.M.A.") number must be obtained from D&M. Products returned without an R.M.A. number clearly marked on the outside of the shipping carton will be refused. Except for approved warranty returns, D&M will only accept for return and credit new, unused, undamaged, current stock items, in the original packaging. Buyer shall be responsible for all freight charges, import/export charges, duties, tariffs, taxes, insurance and risk of loss/damage regarding return shipment to D&M.

**7. DRAWINGS/MEASUREMENTS: #**

All ratings, drawings, tables, graphs and the like submitted by D&M or set forth in written materials or on the company's website are approximations only. Weights, measurements, capacities and all other particulars of products or services offered by D&M are approximations only. D&M is not responsible for such approximations, including, in particular, based on data supplied by Buyer.

**8. LIMITE D WARRANTY:#**

(a). At the time of shipment, new and unused product shall be free from defects in materials and workmanship. D&M warrants that for a period of one (1) year from the date the product is first used by Buyer, or 18 months from the date of shipment, whichever occurs first, if any product or part is found by D&M to be defective, D&M will, at its sole discretion and as Buyer's exclusive remedy, either repair, replace or return the purchase price paid to D&M; provided that the subject product is used under normal conditions for which it was designed and installed, operated and maintained in accordance with D&M's instructions and in accordance with generally accepted industrial practices. Products repaired or replaced during the warranty period shall be covered by the foregoing warranty for the remainder of the original warranty period or ninety (90) days from date of the repair or shipment of the replacement, whichever is longer. D&M warrants, for a period of ninety (90) days, that services shall be performed in a workman like manner. Buyer's sole remedy for a breach of this service warranty is limited to further service or a refund or credit of amounts paid by Buyer, at Seller's option. (b) D&M's warranty obligation shall be conditioned upon receipt by D&M of written notice of any alleged defects within sixty (60) days after discovery. D&M will not be responsible for unauthorized repairs to any products, even if defective. D&M shall not be responsible for any products which have been altered, abused, misused, or improperly installed or repaired, or for any loss, damage, defect, claim or nonperformance resulting from or attributable to Buyer's specifications. D&M does not guarantee production rates or the quality of goods made using D&M's products or services, nor shall any longer warranty periods apply, except as agreed in writing signed by an authorized D&M representative. (c) Where Buyer orders non-stock products or parts manufactured by a third-party, D&M will, to the extent permitted, pass through to Buyer any warranty of the manufacturer. As to such items, Buyer's sole remedy for breach of warranty shall be the remedy offered by and available from the manufacturer, if any. (d) D&M'S WARRANTY HEREIN IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES OF D&M AND ANY PARENT OR AFFILIATED COMPANIES OF D&M. D&M DISCLAIMS ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE OR USE. (e) UNDER NO CIRCUMSTANCES SHALL D&M, OR ANY PARENT OR AFFILIATED COMPANY OF D&M, BE LIABLE TO BUYER OR ANY ENTITY FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER ARISING FROM BREACH OF CONTRACT, TORT, NEGLIGENCE, MISREPRESENTATION, STRICT LIABILITY OR OTHERWISE, INCLUDING FOR LOST PROFITS, IMPAIRMENT OF GOODS, WORK STOPPAGE OR OTHERWISE, IN ANY WAY ARISING OUT OF OR RELATED TO PRODUCTS OR SERVICES SUPPLIED BY D&M OR ANY TRANSACTION TO WHICH THESE STANDARD TERMS APPLY. THE MAXIMUM LIABILITY OF D&M, INCLUDING, BUT NOT LIMITED TO, WITH RESPECT TO THE DESIGN, MANUFACTURE, SALE, DELIVERY, RESALE, INSPECTION, ASSEMBLY, INSTALLATION, TESTING, REPAIR, REPLACEMENT, MAINTENANCE OR USE OF ANY PRODUCT OR THE PERFORMANCE OF ANY SERVICE, SHALL NOT EXCEED THE PURCHASE PRICE PAID TO D&M.

The liability of D&M, any parent or affiliated company for patent infringement is limited to D&M's defense of proceeding brought against Buyer based on a claim that products, when employed in the manner intended by D&M, constitutes an infringement of any U.S. patent. If Buyer's use of the products in the manner intended by D&M is finally enjoined in such action, D&M shall, at its option, procure for Buyer the right to continue using the products, replace the same with non-infringing products, modify the products so that they become non-infringing equivalent products, or refund the purchase price (less allowance for use, damage or obsolescence). D&M makes no warranty against patent infringement resulting from portions of the products made to Buyer's specifications or the use of products in combination with any other goods or in the practice of any process, and if a claim is brought against D&M or any parent or affiliate of D&M, Buyer shall defend, indemnify and hold D&M (and its parent/affiliates) harmless from and against any and all claims, losses or damages arising therefrom.

These Terms and the relationship of the parties are governed by the internal laws of the State of Illinois, U.S.A., without regard to its choice of law rules. For all claims or disputes arising out of or relating to the sale of products or services by D&M and/or the relationship of the parties, Buyer shall file any and all lawsuits or claims exclusively in the state or federal courts located in Cook County, Illinois. Buyer hereby submits to the personal jurisdiction of said courts and waives any claim of improper or inconvenient venue. To the fullest extent permitted by law, Buyer hereby agrees to waive the right to trial by jury for all claims or disputes arising out of or relating to the sale of products or services by D&M and/or the relationship of Buyer and D&M. The parties agree that U.N. Convention of Contracts for the international Sale of Goods shall not apply to their relationship or the sale of products by D&M.

Buyer acknowledges that the products and related software and technology may be subject to export controls of the U.S. Government, including the Export Administration Regulations of the U.S. Department of Commerce. Buyer shall comply with all applicable laws, regulations, treaties and agreements regarding the use, import, export or re-export of the products and shall be solely responsible for obtaining all required licenses or approvals. The products are not intended for use in any nuclear, chemical or weapons production or environmental damage or for export, re-export, or distribution to any restricted or embargoed country or to a person or entity whose privilege to participate in exports has been denied or restricted by the U.S. Government. Buyer shall indemnify, hold harmless and defend D&M, its parent and affiliated companies from any violation of this section by Buyer or its employees, consultants, agents and customers.

**12. MISCELLANEOUS: #**

(a) Failure on the part of D&M to enforce any of its rights derived from these Terms shall never be construed as a waiver of any of D&M's rights.#  
 (b) The invalidity of one or more of the clauses herein shall not affect the validity of the other clauses, which for this purpose are considered severable.#  
 (c) Any use by Buyer of any AYAI trademark must be approved by YAI in writing.#  
 (d) Buyer may not delegate its performance or assign its rights under these Terms except upon the express written consent of D&M. In any case, these Terms shall be binding upon the successors and legal representatives of Buyer.

YASKAWA.COM



Yaskawa is the leading global manufacturer of low and medium voltage variable frequency drives, servo systems, machine controllers and industrial robots. Our standard products, as well as tailor-made solutions, are well known and have a high reputation for outstanding quality and reliability.



**YASKAWA**

**YASKAWA AMERICA, INC.** | Drives & Motion Division

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