YASKAWA

GA500 & GA501 SELECTION GUIDE

AC MICRODRIVES FOR INDUSTRIAL APPLICATIONS

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1 GA500 Preface

Intended Audience

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Additional Resources

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

Resource Links	
GA500 Product Transition Guide	GA500 Flyer
GA500 Brochure	

2 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 to Use - Easy to Maintain
- Easy Installation and System Integration
- 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.

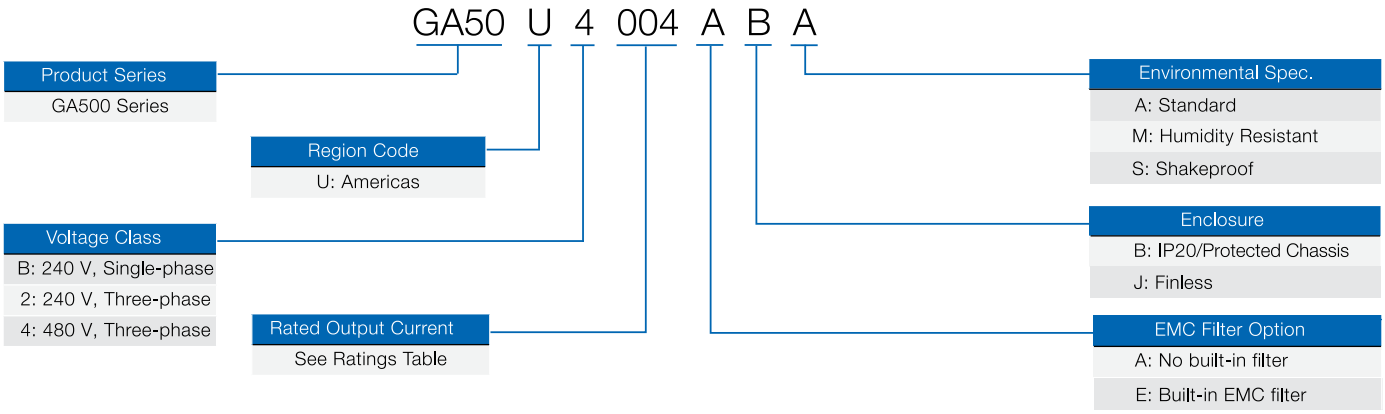


Figure 2.1 Catalog Code

Table 2.1 240 V, Single-Phase Input, IP20/Protected Chassis Drives, 1/6 to 5 HP

Normal Duty Output *1		Heavy Duty Output *1		Standard IP20 Drives *2	Built-In EMC IP20 Drives *3
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
-	-	5	17.5	B018ABA	-

*1 Output capacities stated are for conditions of single-phase input or DC input.
*2 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 *GA500 Enclosure Adapters and Kits on page 18* for extra mounting brackets.

C) Without a separate enclosure, all sizes require UL Type 1 Adapters. See *GA500 Enclosure Adapters and Kits on page 18*.

*3 Built-in EMC (IP20) Drives are subject to a 16-week lead time if no forecast is provided.

Table 2.2 240 V, Three-Phase Input, IP20/Protected Chassis Drives, 1/6 to 30 HP

Normal Duty Output *1		Heavy Duty Output *1		Standard IP20 Drives *2	Built-In EMC IP20 Drives *3
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

*1 Output capacities stated are for conditions of 3 phase input or DC input. See Single-Phase Drive Selection for single phase capability.
*2 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 *GA500 Enclosure Adapters and Kits on page 18* for extra mounting brackets.

C) Without a separate enclosure, all sizes require UL Type 1 Adapters. See *GA500 Enclosure Adapters and Kits on page 18*.

*3 Built-in EMC (IP20) Drives are subject to a 16-week lead time if no forecast is provided.

Table 2.3 480 V, Three-Phase Input, IP20/Protected Chassis Drive, 1/2 to 40 HP

Normal Duty Output *1		Heavy Duty Output *1		Standard IP20 Drives *2	Built-In EMC IP20 Drives *3
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

Normal Duty Output *1		Heavy Duty Output *1		Standard IP20 Drives *2	Built-In EMC IP20 Drives *3
HP	Amps	HP	Amps	Catalog Code GA50U	Catalog Code GA50U
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

*1 Output capacities stated are for conditions of 3 phase input or DC input. See Single-Phase Input Drive Selection for single phase capability.
*2 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 *GA500 Enclosure Adapters and Kits on page 18* for extra mounting brackets.

C) Without a separate enclosure, all sizes require UL Type 1 Adapters. See *GA500 Enclosure Adapters and Kits on page 18*.

*3 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 2.4 240 V, Single-Phase Input Drive Selection

Normal Duty Output *1		Heavy Duty Output *1		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
-	-	5	17.5	B018ABA-134	B018ABS	B018ABM	-	-

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

Table 2.5 240 V, Three-Phase Input Drive Selection

Normal Duty Output *1		Heavy Duty Output *1		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

Normal Duty Output *1		Heavy Duty Output *1		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
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	2030AJA
15	42	10	33	2042ABA-134	2042ABS	2042ABM	2042EBM	2042AJA
20	56	15	47	2056ABA-134	2056ABS	2056ABM	2056EBM	2056AJA
25	70	20	60	2070ABA-134	2070ABS	2070ABM	2070EBM	2070AJA
30	82	25	75	2082ABA-134	2082ABS	2082ABM	2082EBM	-

*1 Output capacities stated are for conditions of 3 phase input or DC input.

Table 2.6 480 V, Three-Phase Input Drive Selection

Normal Duty Output *1		Heavy Duty Output *1		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	4018AJA
15	23.4	10	18	4023ABA-134	4023ABS	4023ABM	4023EBM	4023AJA
20	31	15	24	4031ABA-134	4031ABS	4031ABM	4031EBM	4031AJA
25	38	20	31	4038ABA-134	4038ABS	4038ABM	4038EBM	4038AJA
30	44	25	39	4044ABA-134	4044ABS	4044ABM	4044EBM	-
40	60	30	45	4060ABA-134	4060ABS	4060ABM	4060EBM	

*1 Output capacities stated are for conditions of 3 phase input or DC input.

Single-Phase Input Derate

Table 2.7 240 V, Single-Phase Input, Three-Phase Output

Catalog Code GA5xU *1 *2	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
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

Catalog Code GA5xU *1 *2	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
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	-
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.

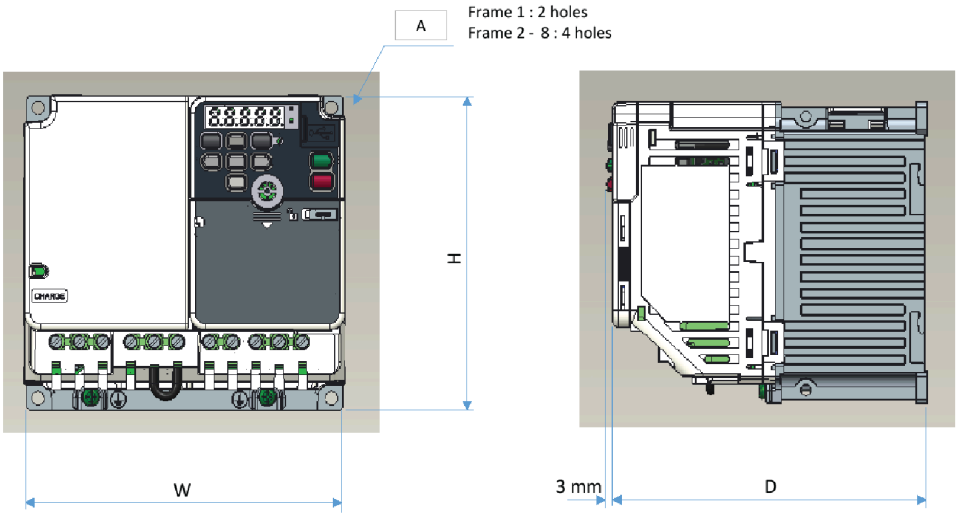
Table 2.8 480 V, Single-Phase Input, Three-Phase Output

Catalog Code GA5xU *1 *2	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	-
4002	1/4	0.6	1/3	0.8	URX000291	URX000651	URX000036	-
4004	1/2	1.1	1	2.1	URX000299	URX000410	URX000040	-
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 the Drive tables based on drive type.

3 GA500 Dimensions and Weights

IP20/Protected Chassis Dimensions



IP20/Protected Chassis Drive without EMC Filter

Table 3.1 Dimensions without EMC Filter

Frame	Dimensions in (mm)		
	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 3.2 Dimensions with EMC Filter

Frame	Dimensions in (mm)		
	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)

Frame	Dimensions in (mm)		
	Height	Width	Depth
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 3.3 240 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
-	5	B018ABA	-	17.6	6.4 (2.9)	4

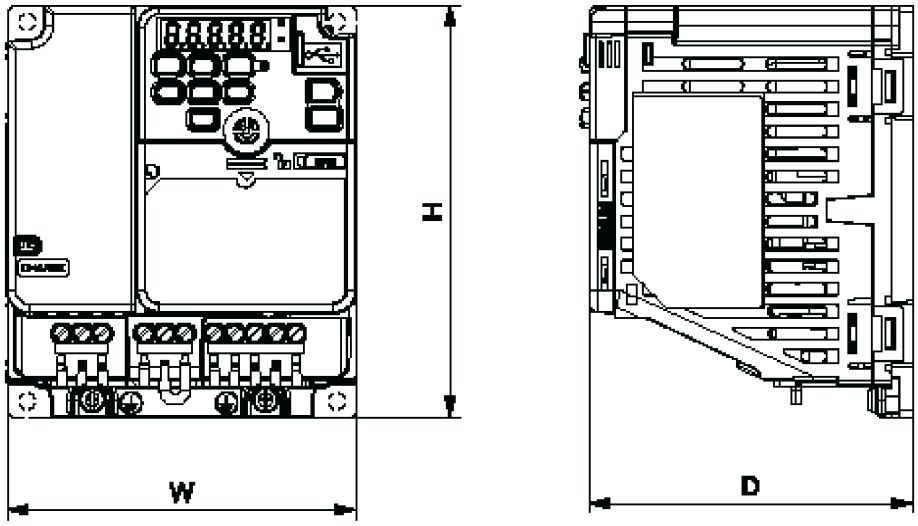
Table 3.4 240 V, Three-Phase Drives

Normal Duty (ND)	Heavy Duty (HD)	Catalog Code GA50U	Output Amps		Weight lb (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 3.5 480 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



Finless Drive

Table 3.6 240 V, Single-Phase Finless 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 3.7 240 V, Three-Phase Finless 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)
2030	5.51 (140)	10.24 (260)	5.71 (145)	6.39 (2.9)
2042	5.51 (140)	5.51 (140)	5.71 (145)	6.83 (3.1)
2056	7.09 (180)	11.81 (300)	5.79 (147)	9.92 (4.5)
2070	8.66 (220)	13.78 (350)	5.98 (152)	13.23 (6.0)

Table 3.8 480 V, Three-Phase Finless 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)
4018	5.51 (140)	10.24 (260)	5.71 (145)	5.73 (2.6)
4023	5.51 (140)	10.24 (260)	5.71 (145)	6.17 (2.8)
4031	7.09 (180)	11.81 (300)	5.79 (147)	9.04 (4.1)
4038	7.09 (180)	11.81 (300)	5.79 (147)	9.48 (4.3)

4 GA500 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 22 kW)
	480 V, Three-Phase: 1/2 to 40 HP (0.2 to 30 kW)
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^2
	20 to 55 Hz: 5.9 m/s^2
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), PLe

5 GA500 Network Communication Options

Network Communication Options

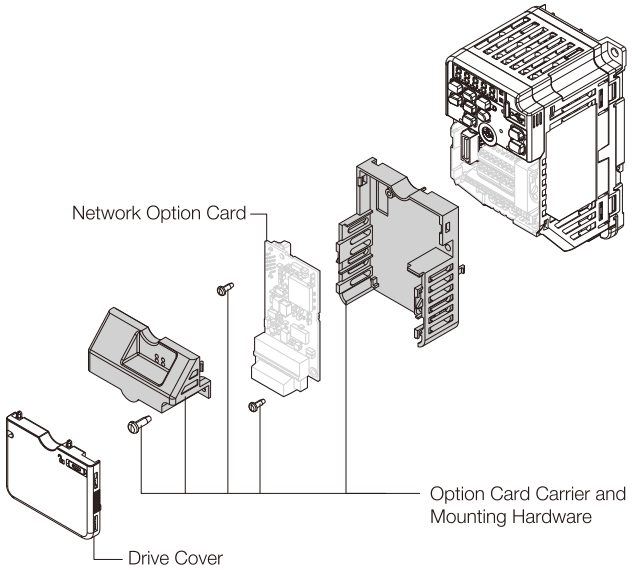
These cards and devices add control functionality to the standard drive. Items are shipped loose and unmounted. Use of an option card on a GA500 requires the separately-sold Option Card Carrier.

Table 5.1 Communication Options

Part Number	Option	Purpose
JOHB-SMP3-MB	Multi-Protocol Ethernet	Multi-protocol dual port Ethernet card to connect to EtherNet/IP, Modbus TCP/IP, PROFINET, MECHATROLINK-4, or EtherCAT networks. **This option includes the Option Card Carrier required for GA500.**
SI-P3	PROFIBUS-DP	PI-compliant option card to connect to a PROFIBUS-DP network.
SI-N3	DeviceNet	ODVA-compliant option card to connect to a DeviceNet network.
SI-S3	CANopen	CANopen is a CAN-based communication system.
SI-C3	CC-Link	CC-Link provides building automation communication capabilities.
SI-T3	MECHATROLINK-II	MECHATROLINK provides building automation communication capabilities.
SI-ET3	MECHATROLINK-III	MECHATROLINK provides building automation communication capabilities.

Table 5.2 Option Card Carrier

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



6 GA500 Keypads, Accessories, and Cables

Additional Information
Keypads and Cables

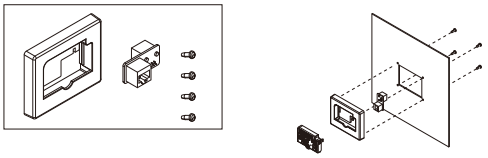
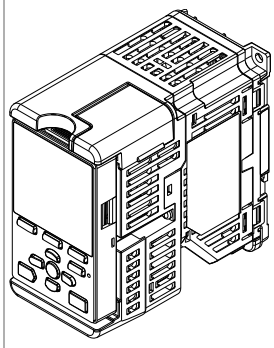
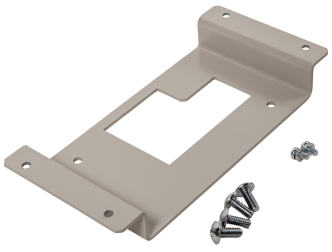
Keypads

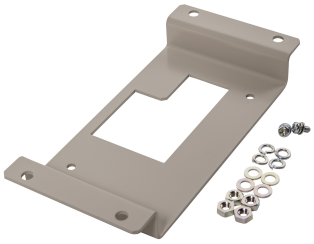
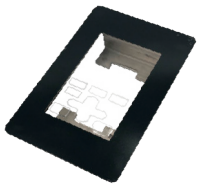
Part Number	Option	Purpose
JVOP-KPLCA04MEB	Local/Remote Keypad	Standard LCD Local/Remote Keypad (standard, non-Bluetooth)
JVOP-KPLCC04MBB	Bluetooth Keypad	LCD Keypad with Bluetooth for use with DriveWizard Mobile

Standard LCD Keypad

LCD Keypad with Bluetooth

Remote Mount Adapters

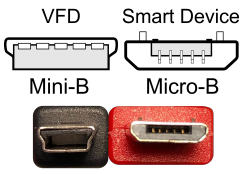
Part Number	Option	Representation
ZPBA-GA500	UL Type 1 LED keypad mounting kit for the standard keypad	
JVOP-KPBCH04AAA	Blank LED keypad when external mounting standard keypad (optional)	
JZSP-GA500	LCD keypad mounting kit (for mounting LCD keypad onto drive)	
900-192-933-001	Type 1 LCD Keypad Panel Mount Kit A (brackets have tapped holes for use with screws)	

Part Number	Option	Representation
900-192-933-002	Type 1 LCD Keypad Panel Mount Kit B (brackets have untapped holes for use with panel studs)	
900-239-230-001	Type 12/3R LCD Keypad Panel Mount (with embedded studs)	
UUX001955	Type 4X LCD Keypad Panel Mount Kit	

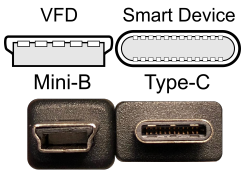
Cables

Part Number	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

Part Number	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.



Part Number: UWR01516-B - USB Mini-B to USB Micro-B



Part Number: UWR01516-C - USB Mini-B to USB Type-C

7 GA500 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 an IP20/Protected Chassis drive into a UL Type 1 drive.

Table 7.1 240 V, Single-Phase, IP20/UL Type 1 Adapter Kit

Catalog Code GA50U	UL Type 1 Adapter
	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 7.2 240 V, Three-Phase, IP20/UL Type 1 Adapter Kit

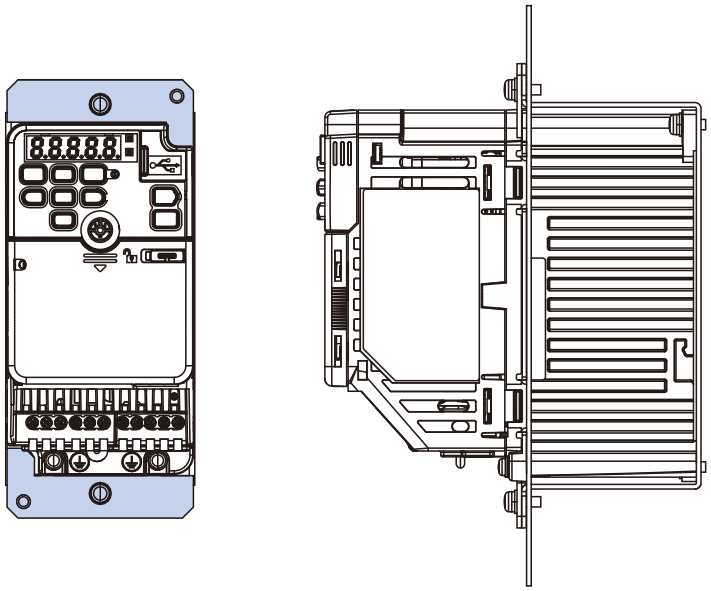
Catalog Code GA50U	UL Type 1 Adapter
	Catalog Code
2001ABA	ZBAA-GA50V1-1
2002ABA	ZBAA-GA50V1-1
2004ABA	ZBAA-GA50V1-1
2006ABA	ZBAA-GA50V1-1
2010ABA	ZBAA-GA50V2-3
2012ABA	ZBAA-GA50V2-1

Catalog Code GA50U	UL Type 1 Adapter
	Catalog Code
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 7.3 480 V, Three-Phase, IP20/UL Type 1 Adapter Kit

Catalog Code GA50U	UL Type 1 Adapter
	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. Example image.

Table 7.4 240 V, Single-Phase, Drive Mounting Adapters

Catalog Code GA50U	External Heatsink Adapter
	Catalog Code
B001xBA	ZPSA-GA50V1-1
B002xBA	ZPSA-GA50V1-1
B004xBA	ZPSA-GA50V1-2
B006xBA	ZPSA-GA50V2-2
B010xBA	ZPSA-GA50V2-3
B012xBA	ZPSA-GA50V3-1
B018xBA	ZPSA-GA50V4-1

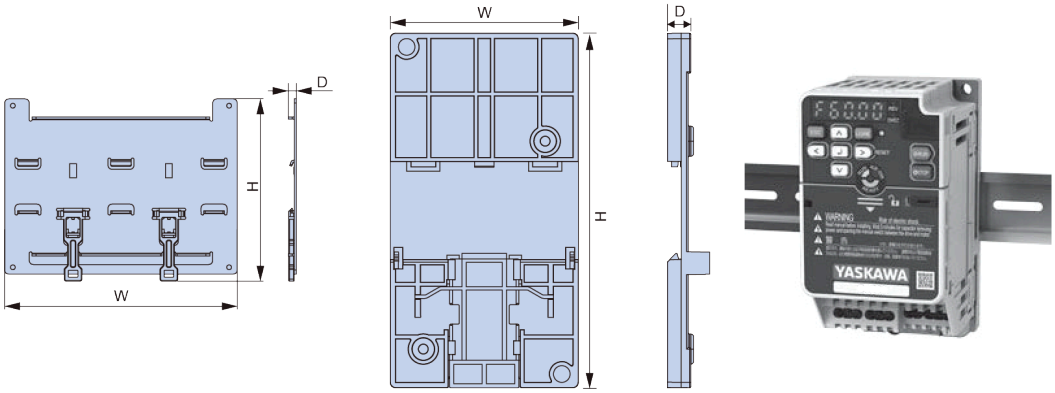
Table 7.5 240 V, Three-Phase, Drive Mounting Adapters

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

Table 7.6 480 V, Three-Phase, Drive Mounting Adapters

Catalog Code GA50U	External Heatsink Adapter
	Catalog Code
4001xBA	ZPSA-GA50V2-1
4002xBA	ZPSA-GA50V2-2
4004xBA	ZPSA-GA50V2-2
4005xBA	ZPSA-GA50V2-3
4007xBA	ZPSA-GA50V2-3
4009xBA	ZPSA-GA50V2-3
4012xBA	ZPSA-GA50V3-1
4018xBA	ZPSA-GA50V5-1
4023xBA	ZPSA-GA50V5-1
4031xBA	ZPSA-GA50V6-1
4038xBA	ZPSA-GA50V6-1
4044xBA	ZPSA-GA50V8-1
4060xBA	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 (6.7 in) wide and less than 128 mm (5.0 in) tall.

Table 7.7 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	
B012ABA	ZPZ-GA50V3
B018ABA	EZZ08122D

Table 7.8 240 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 do not mount on DIN rails.
2042ABA	
2056ABA	
2070ABA	
2082ABA	

Table 7.9 480 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 do not mount on DIN rails.
4023ABA	
4031ABA	
4038ABA	
4044ABA	
4060ABA	

Shield Clamp Kit

When using a shielded motor cable, the shield clamp kit provides an easy termination point for the ground and shield of the motor cable.

Table 7.10 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 7.11 240 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 7.12 480 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	

Catalog Code GA50U	Shield Clamp Kit
	Catalog Code
4044ABA	ZHZ-GA50V8
4060ABA	

8 GA500 Power Options

Power options are add-on devices that can be used to help increase power factor, improve harmonics, and accommodate single-phase input power.

Name	Purpose
EMC Filters	• IP20 rated • Install external EMC filters to the drive input to comply with C2 levels of the EN 61800-3 EMC directive. • Provides electrical noise mitigation on the input side of the drive.
DC Bus Reactor	• Improves the drive input power factor. • 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. • Decreases harmonic current • Improves the power supply total power factor.
AC Reactor	• Improves the drive input power factor. • 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. • Decreases harmonic current • Improves the power supply total power factor.
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 8.1 240 V, Single-Phase EMC Filters

Catalog Code GA5xU	Part Number
B001	FS23638-10-07
B002	FS23638-10-07
B004	FS23638-10-07
B006	FS23638-20-07
B010	FS23638-20-07
B012	FS23638-30-07
B018	FS23638-40-07

Table 8.2 240 V, Three-Phase EMC Filters

Catalog Code GA5xU	Part Number
2001	FS23637-8-07
2002	FS23637-8-07
2004	FS23637-8-07
2006	FS23637-8-07
2010	FS23637-14-07
2012	FS23637-14-07
2021	FS23637-24-07
2030	FS5973-35-07
2042	FS5973-60-07
2056	FS5973-100-07
2070	FS5973-100-07
2082	Contact Factory

Table 8.3 480 V, Three-Phase EMC Filters

Catalog Code GA5xU	Part Number
4001	FS23639-5-07
4002	FS23639-5-07
4004	FS23639-5-07
4005	FS23639-10-07
4007	FS23639-10-07
4009	FS23639-10-07
4012	FS23639-15-07
4018	FS5972-35-07
4023	FS5972-35-07
4031	FS5972-60-07
4038	FS5972-60-07
4044	Contact Factory
4060	

EMC Filter Dimensions

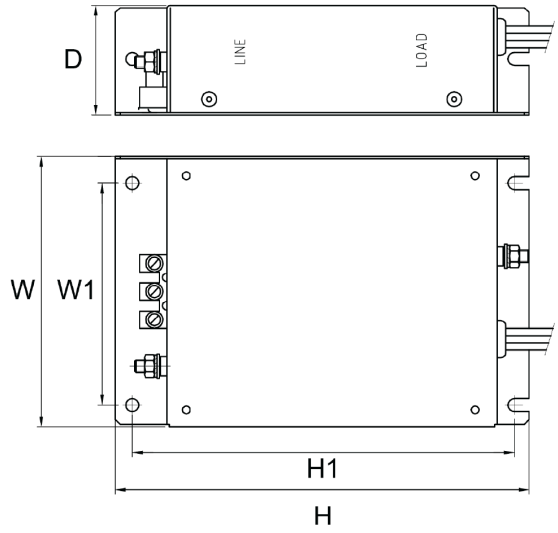


Table 8.4 EMC Filter Dimensions

Dimensions (mm)						
Model Number	H	W	D	H1	W1	Weight (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	0.88
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 8.5 240 V, Three-Phase DC Bus Reactors

HP	Catalog Code GA5xU		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	-	URX000072	URX000266	URX000073	URX000265

Table 8.6 480 V, Three-Phase DC Bus Reactors

HP	Catalog Code GA5xU		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

HP	Catalog Code GA5xU		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
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	-	URX000073	URX000265	URX000071	-

Open Type DC Bus Reactor Dimensions

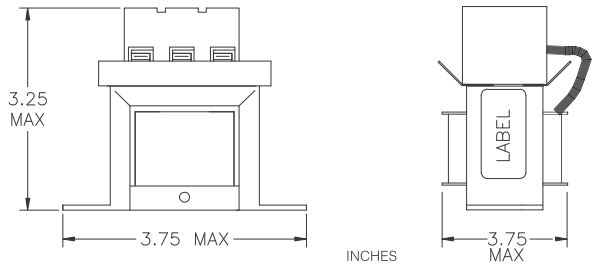


Figure 8.1 Reactor 1

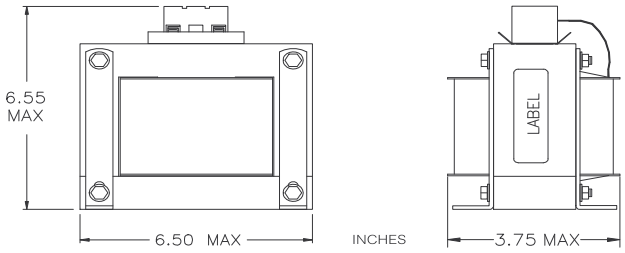


Figure 8.2 Reactor 2

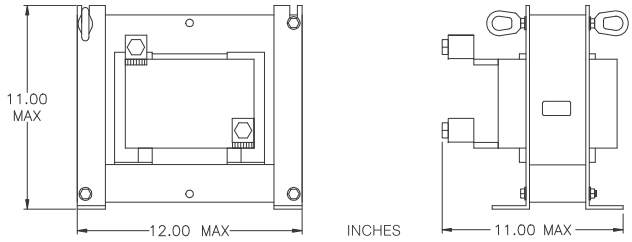


Figure 8.3 Reactor 3

Table 8.7 Open Type DC Reactor Dimensions

DC Bus Reactor	Figure
05P00620-0109	Figure 8.1
05P00620-0110	Figure 8.1
05P00620-0111	Figure 8.2
05P00620-0115	Figure 8.2
05P00652-0213	Figure 8.2
05P00652-0216	Figure 8.2
URX000039	Figure 8.1
URX000041	Figure 8.1
URX000042	Figure 8.2
URX000044	Figure 8.2

DC Bus Reactor	Figure
URX000046	Figure 8.2
URX000048	Figure 8.2
URX000049	Figure 8.2
URX000052	Figure 8.2
URX000053	Figure 8.2
URX000054	Figure 8.2
URX000055	Figure 8.2
URX000056	Figure 8.2
URX000057	Figure 8.2
URX000058	Figure 8.2

DC Bus Reactor	Figure
URX000059	Figure 8.2
URX000064	Figure 8.2
URX000068	Figure 8.3
URX000071	Figure 8.3

DC Bus Reactor	Figure
URX000072	Figure 8.3
URX000073	Figure 8.3
URX000371	Figure 8.2

Enclosed DC Reactor Dimensions

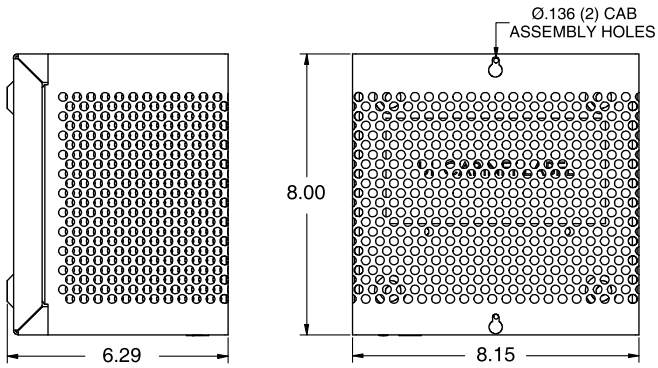


Figure 8.4 CAB-8

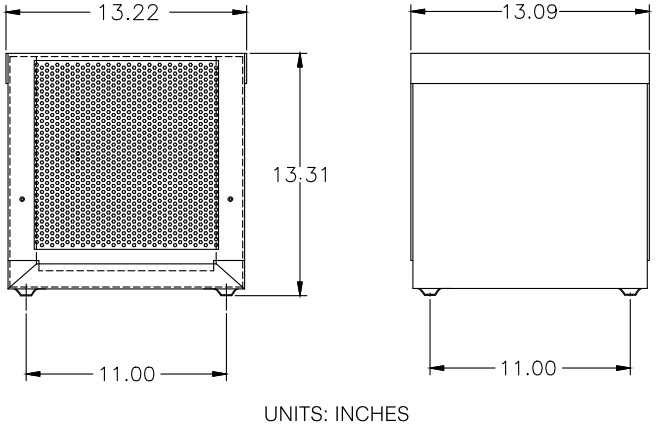


Figure 8.5 CAB-13V

Table 8.8 Enclosed UL Type 1 DC Reactor Dimensions

DC Bus Reactor	Figure
URX000184	Figure 8.4
URX000207	Figure 8.4
URX000208	Figure 8.4
URX000209	Figure 8.4
URX000210	Figure 8.4
URX000211	Figure 8.4
URX000212	Figure 8.4
URX000213	Figure 8.5
URX000214	Figure 8.5
URX000215	Figure 8.4
URX000216	Figure 8.4
URX000217	Figure 8.4
URX000218	Figure 8.4

DC Bus Reactor	Figure
URX000219	Figure 8.4
URX000220	Figure 8.4
URX000221	Figure 8.4
URX000223	Figure 8.5
URX000224	Figure 8.5
URX000225	Figure 8.5
URX000257	Figure 8.4
URX000258	Figure 8.4
URX000259	Figure 8.4
URX000260	Figure 8.5
URX000262	Figure 8.4
URX000265	Figure 8.5
URX000266	Figure 8.5

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 8.9 240 V, Single-Phase, AC Input Reactors

HP	Catalog Code GA5xU		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	-	B018	URX000319	URX000420	URX000320	URX000421
5	-	B018	URX000319	URX000420	URX000320	URX000421

Table 8.10 240 V, Three-Phase, AC Input Reactors

HP	Catalog Code GA5xU		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	URX000311	URX000415	URX000312	URX000416
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

HP	Catalog Code GA5xU		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
25	2070	2082	URX000332	URX000426	URX000333	URX000554
30	2082	-	URX000335	URX000427	URX000336	URX000555

Table 8.11 480 V, Three-Phase, AC Input Reactor

HP	Catalog Code GA5xU		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	-	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 8.12 240 V, Single-Phase, AC Output Reactors

HP	Catalog Code GA5xU		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	-	B018	05P00620-0134	05P00620-0032
5	-	B018	05P00620-0136	05P00620-0036

Table 8.13 240 V, Three-Phase, AC Output Reactors

HP	Catalog Code GA5xU		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

HP	Catalog Code GA5xU		3% Output Reactor	
	Normal Duty	Heavy Duty	Open Type	Enclosed UL Type 1
			Catalog Code	Catalog Code
25	2070	2082	05P00620-0143	05P00620-0058
30	2082	-	URX000085	URX000204

Table 8.14 480 V, Three-Phase, AC Output Reactors

HP	Catalog Code GA5xU		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	-	05P00620-0142	05P00620-0055

AC Open Reactor Dimensions & Weights

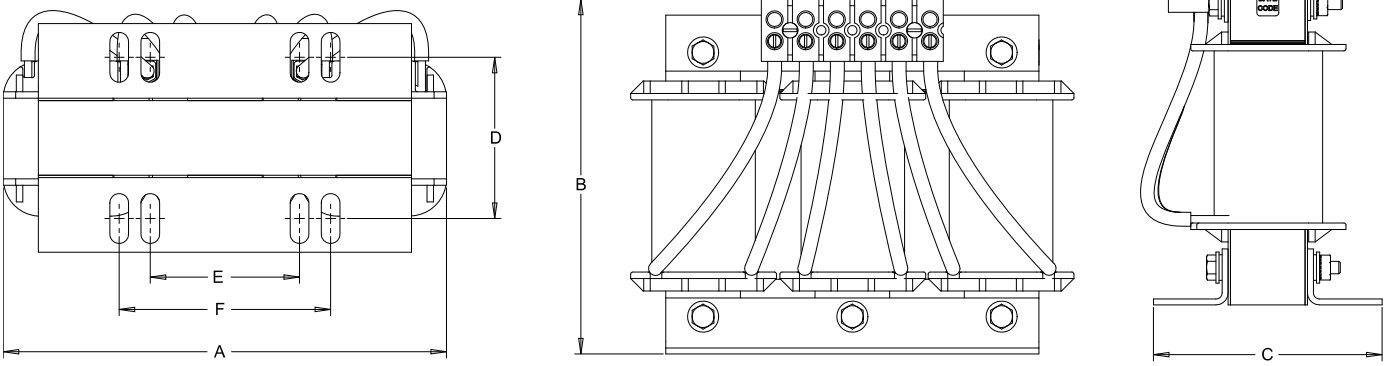


Table 8.15 AC Open Reactor Dimensions

Open Type Reactor Catalog Code	Watt Loss	Dimensions (mm/in)						Weight kg/lb
		A	B	C	D	E	F	
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	-	-	101.6/4	0.9/2
URX000281	8.8	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000283	4.8	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000284	7.8	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000288	10.9	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2

Open Type Reactor Catalog Code	Watt Loss	Dimensions (mm/in)						Weight kg/lb
		A	B	C	D	E	F	
URX000289	15	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000291	9	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000292	14.3	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000295	12.3	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000296	19.6	114.3/4.5	94/3.7	38.1/1.5	-	-	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	-	-	101.6/4	0.9/2
URX000300	23	114.3/4.5	94/3.7	38.1/1.5	-	-	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	-	-	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	-	76.2/3	5.9/13
URX000325	122	180.3/7.1	147.3/5.8	106.7/4.2	81.3/3.2	-	76.2/3	8.2/18
URX000327	100	180.3/7.1	144.8/5.7	106.7/4.2	81.3/3.2	-	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	-	76.2/3	8.2/18
URX000330	110	180.3/7.1	142.2/5.6	142.2/5.6	81.3/3.2	-	76.2/3	9.1/20
URX000332	87	180.3/7.1	142.2/5.6	127/5	81.3/3.2	-	76.2/3	8.2/18
URX000333	105	180.3/7.1	144.8/5.7	152.4/6	81.3/3.2	-	76.2/3	18 (8.2)
URX000335	119	180.3/7.1	142.2/5.6	149.9/5.9	81.3/3.2	-	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

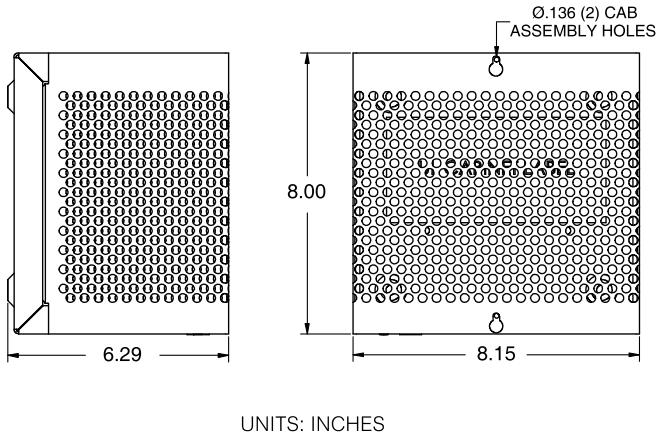


Figure 8.6 CAB-8

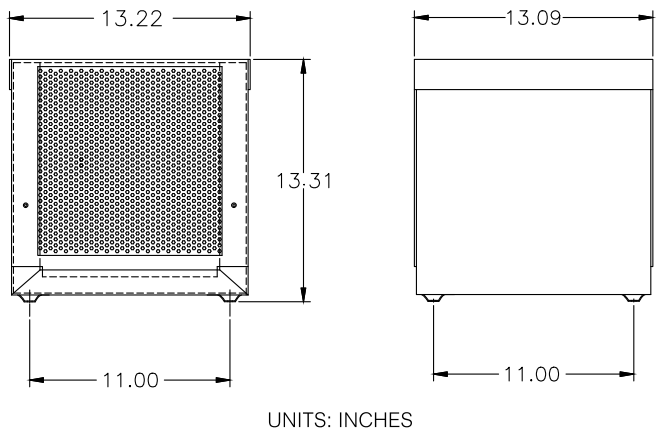


Figure 8.7 CAB-13V

Table 8.16 Enclosed, Input/Output AC Reactor Specifications

Enclosed UL Type 1 Reactor Catalog Code	Cabinet Reference (Figure)	Weight kg/lb
05P00620-0015	Figure 8.7	12.7 / 28
05P00620-0020		12.9 / 28.4
05P00620-0021		16.3 / 36
05P00620-0027		19.1 / 42
05P00620-0028	Figure 8.7	17.2 / 38
05P00620-0029		18.1 / 40
05P00620-0032		20 / 44
05P00620-0033		24.9 / 55
05P00620-0036	Figure 8.6	3.9 / 8.5
05P00620-0037		3.9 / 8.6
05P00620-0041		3.9 / 8.5
05P00620-0042		3.9 / 8.6
05P00620-0046	Figure 8.6	3.9 / 8.6
05P00620-0047		3.9 / 8.5
05P00620-0050		3.9 / 8.6
05P00620-0051		4.4 / 9.7
05P00620-0054	Figure 8.6	4.4 / 9.8
05P00620-0055		5 / 11.1
05P00620-0058		3.9 / 8.5
URX000204		3.9 / 8.5
URX000242	Figure 8.6	4.6 / 10
URX000243		5 / 10
URX000409		3.9 / 8.6
URX000410		3.9 / 8.7

Enclosed UL Type 1 Reactor Catalog Code	Cabinet Reference (Figure)	Weight kg/lb
URX000411	Figure 8.6	4 / 8.8
URX000413		4.4 / 9.7
URX000414		5.1 / 11.2
URX000415	Figure 8.6	4.4 / 9.8
URX000416		5.1 / 11.3
URX000417		6.4 / 14.1
URX000418	Figure 8.7	10.1 / 22.2
URX000419		11.4 / 25.2
URX000420		10.5 / 23.1
URX000421		12.5 / 27.5
URX000422	Figure 8.7	12.7 / 28
URX000423		14.1 / 31
URX000425		15.9 / 35
URX000426	Figure 8.7	16.3 / 36
URX000427		16.8 / 37
URX000501		16.3 / 36
URX000502	Figure 8.6	3.9 / 8.6
URX000503		4 / 8.8
URX000504		4.4 / 9.8
URX000505	Figure 8.6	5.6 / 12.3
URX000551		3.9 / 8.6
URX000552		4.4 / 9.8
URX000553	Figure 8.7	17.2 / 38
URX000554		18.1 / 40
URX000555		20 / 44
URX000568		12.7 / 28
URX000571	Figure 8.6	3.9 / 8.6
URX000573		4.4 / 9.7
URX000574		5 / 11.1
URX000575	Figure 8.7	12.9 / 28.4
URX000576		16.3 / 36
URX000577		19.1 / 42
URX000584	Figure 8.6	3.9 / 8.6
URX000585		3.9 / 8.6
URX000651		3.9 / 8.5
URX000652	Figure 8.6	3.9 / 8.5
URX000653		3.9 / 8.5
URX000654		3.9 / 8.5

Dynamic Braking Options

Additional Information	
Braking Resistor Specifications	Braking Resistor Drawings
Braking Connection Diagrams	

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 8.17 240 V, Single-Phase, 10% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	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
-	5	B018	USR000025	1

Table 8.18 240 V, Three-Phase, 10% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	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

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	10% Dynamic Braking Option (max 10 second on-time)	
			Resistor	
			Catalog Code	Quantity
25	20	2070	URS000136	1
30	25	2082	URS000136	1

Table 8.19 480 V, Three-Phase, 10% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	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

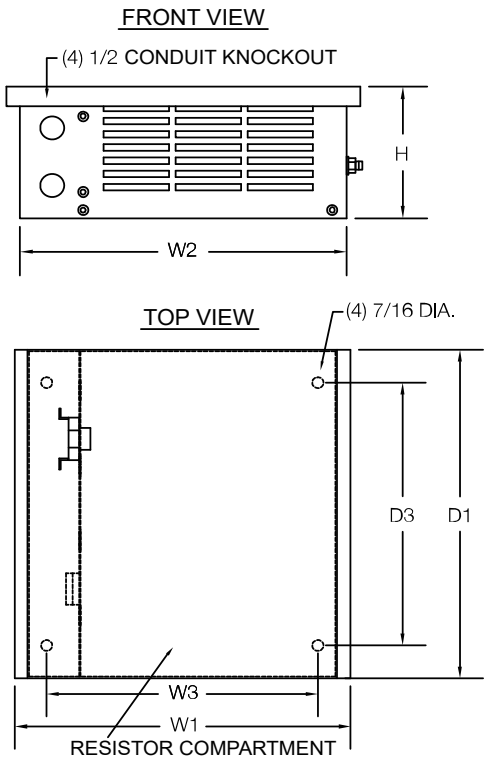
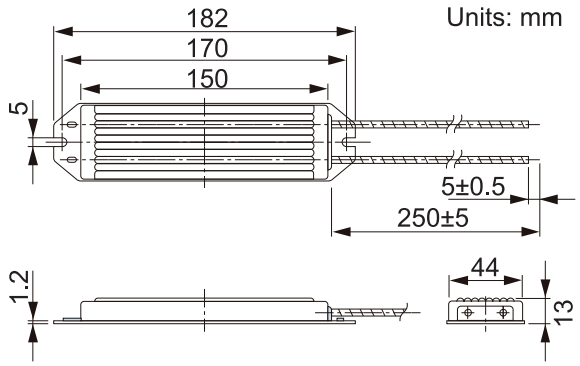


Table 8.20 GCE Type Enclosure Dimensions

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 (0.44 lbs)
(All ERF-150WJx Series Models)

Table 8.21 240 V, Single-Phase, 3% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	Resistor *1	
			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
-	5	B018	R7510	2

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

Table 8.22 240 V, Three-Phase, 3% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	Resistor *1	
			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 8.23 480 V, Three-Phase, 3% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	Resistor *1	
			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	
R1000 Product Page	Flyer
Drawings	Manual

Each R1000 regenerative unit system requires these 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 tables.

Table 8.24 240 V R1000 Kits

240 V Regenerative Kit Number	System Capacity	R1000 Model Number in Kit CIMR-RU	Enclosure Type
	Maximum Applicable Motor Capacity (HP) *1		
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	

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

Table 8.25 480 V R1000 Kits

480 V Regenerative Kit Number	System Capacity	R1000 Model Number in Kit CIMR-RU	Enclosure Type
	Maximum Applicable Motor Capacity (HP) *1		
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	

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

R1000 Power Regenerative Units

Each R1000 regenerative unit system requires these 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 *1 100% / 80%	Part Number Yaskawa (MTE)	Part Number Yaskawa (MTE)	Part Number Yaskawa (Mersen)	Qty. Req.	Part Number Yaskawa (Mersen)
3.5 (5)	2A03P5FAA *2	10/8	05P00620-0134 (RL-01201)	05P00620-0136 (RL-01801)	FU-002031 (A60Q20-2)	1	FU-002055 (30323)
5 (7)	2A0005FAA *2	15/12	URX000083 (RL-02501)	05P00620-0138 (RL-02502)	FU-002031 (A60Q20-2)	1	FU-002055 (30323)
7 (9)	2A0007FAA *2	20/16	URX000083 (RL-02501)	05P00620-0044 (RL-03501)	FU-002032 (A60Q30-2)	1	FU-002055 (30323)
10 (13)	2A0010FAA *2	30/24	05P00620-0044 (RL-03501)	05P00620-0140 (RL-04501)	UFU000153 (A30QS50-4)	3	FU-002082 (P243G)
14 (19)	2A0014FAA *2	41/33	05P00620-0141 (RL-05501)	05P00620-0141 (RL-05501)	UFU000479 (A30QS60-4)	3	FU-002082 (P243G)
17 (23)	2A0017FAA *2	50/40	05P00620-0143 (RL-08001)	05P00620-0143 (RL-08001)	UFU000154 (A30QS80-4)	3	FU-002083 (P243)
20 (27)	2A0020FAA *2	60/48	URX000085 (RL-10001)	05P00620-0143 (RL-08001)	UFU000155 (A30QS100-4)	3	FU-002083 (P243)

*1 100% for 1 minute, (25% ED) / 80% continuous, ED = Duty Cycle.
*2 IP20/NEMA 1enclosure.
*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 *1 100% / 80%	Part Number Yaskawa (MTE)	Part Number Yaskawa (MTE)	Part Number Yaskawa (Mersen)	Qty. Req.	Part Number Yaskawa (Mersen)
3.5 (5)	4A03P5FAA *2	5/4	05P00620-0025 (RL-00803)	05P00620-0133 (RL-00802)	FU-002030 (A60Q15-2)	1	FU-002055 (30323)
5 (7)	4A0005FAA *2	8/6	05P00620-0133 (RL-00802)	05P00620-0135 (RL-01202)	FU-002030 (A60Q15-2)	1	FU-002055 (30323)
7 (9)	4A0007FAA *2	11/9	05P00620-0135 (RL-01202)	05P00620-0137 (RL-01802)	FU-002030 (A60Q15-2)	1	FU-002055 (30323)
10 (13)	4A0010FAA *2	16/13	05P00620-0137 (RL-01802)	05P00620-0138 (RL-02502)	FU-002032 (A60Q30-2)	1	FU-002055 (30323)
14 (19)	4A0014FAA *2	22/18	URX000083 (RL-02501)	05P00620-0139 (RL-03502)	FU-002032 (A60Q30-2)	1	FU-002055 (30323)
17 (23)	4A0017FAA *2	27/22	05P00620-0044 (RL-03501)	05P00620-0139 (RL-03502)	FU-000783 (A50P50-4)	3	FU-002082 (P243G)
20 (27)	4A0020FAA *2	32/26	05P00620-0049 (RL-04502)	05P00620-0049 (RL-04502)	FU-000783 (A50P50-4)	3	FU-002082 (P243G)
28 (38)	4A0028FAA *2	43/34	05P00620-0142 (RL-05502)	05P00620-0142 (RL-05502)	UFU000480 (A50P60-4)	3	FU-002082 (P243G)

*1 100% for 1 minute, (25% ED) / 80% continuous, ED = Duty Cycle.
*2 IP20/NEMA 1enclosure.
*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 heatsink external (NEMA 1 backside) to the enclosure. Option kit for customer mounting. Larger standard drives include brackets.

Table 8.26 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	

Table 8.27 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	

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	Item
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% *1
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	
Single-Phase Converter	Manual
Specifications	Drawings

Table 8.28 240 V Single-Phase Converters

System Kit Number *1	System Capacity			Component Name	Component Part Number
	Maximum Total Motor Load HP (kW)	Maximum Continuous			
	Rated Power HP *2	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 (37)	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

*1 The kit includes Open Type/Protected Chassis Single-Phase Converter and DC link choke.
*2 The larger power Single-Phase Converter unit can be used on lower power motors.

Table 8.29 480 V Single-Phase Converters

System Kit Number *1	System Capacity			Component Name	Component Part Number
	Maximum Total Motor Load HP (kW)	Maximum Continuous			
	Rated Power HP *2	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

*1 The kit includes Open Type/Protected Chassis Single-Phase Converter and DC link choke.
*2 The larger power Single-Phase Converter unit can be used on lower power motors.

Table 8.30 480 V UL Type 1 Adapters for Single-Phase Converters

Converter Model	Link Choke Part Number	Converter Type 1 Kit Adapter Part Number	Link Choke Type 1 Kit Adapter Part Number
SPBC-2015AAA	URX000530	UUX001686	UUX001688
SPBC-2022AAA	URX000531		
SPBC-2030AAA	URX000532	UUX001687	
SPBC-2037AAA	URX000520	UUX001703	
SPBC-2045AAA	URX000521		
SPBC-4022AAA	URX000534	UUX001686	
SPBC-4030AAA	URX000535		
SPBC-4037AAA	URX000536	UUX001687	
SPBC-4045AAA	URX000537		
SPBC-4056AAA	URX000527	UUX001703	
SPBC-4093AAA	URX000529		

This option consists of a top and bottom cover to convert a Protected Chassis converter and/or DC link choke to a UL Type 1 enclosed unit. This option DOES NOT provide additional space for mounting auxiliary components (i.e., circuit breaker, input fuses, reactor, etc.).

9 GA501 Preface

Intended Audience

This section of the selection guide may describe trademarked products. These trademarks are the property of the registered owner companies and may include the following:

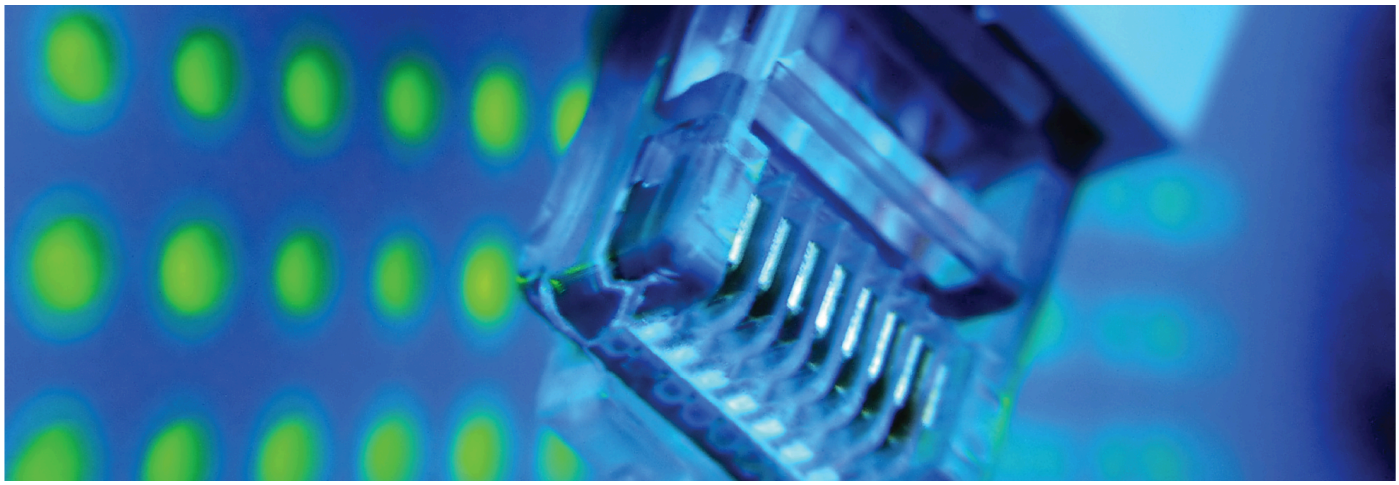
- Modbus®, trademark of Schneider Automation, Inc.
- EtherCAT, trademark of Beckhoff Automation GmbH, Germany
- MECHATROLINK - I, II, III, 4, trademarks of MECHATROLINK Members Association
- PROFINET®, trademark of PROFIBUS International.
- Ethernet/IP, trademark of ODVA
- Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc.

Other Documents and Manuals are available to support special use or installation of this product. These documents may be provided with the product or upon request. Contact Yaskawa America, Inc. or visit www.yaskawa.com.

Additional Resources

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

Resource Links	
GA501 Brochure	GA501 Flyer
GA501 Data Sheet	



10 GA501 AC Microdrives with Built-in Ethernet

Drive Selection

The GA501 Industrial AC Microdrive with built-in Ethernet is engineered to easily handle nearly any application. Designed with sustainability, flexibility, and ease of use in mind, it simplifies even the most demanding tasks while delivering consistent, high-quality performance.

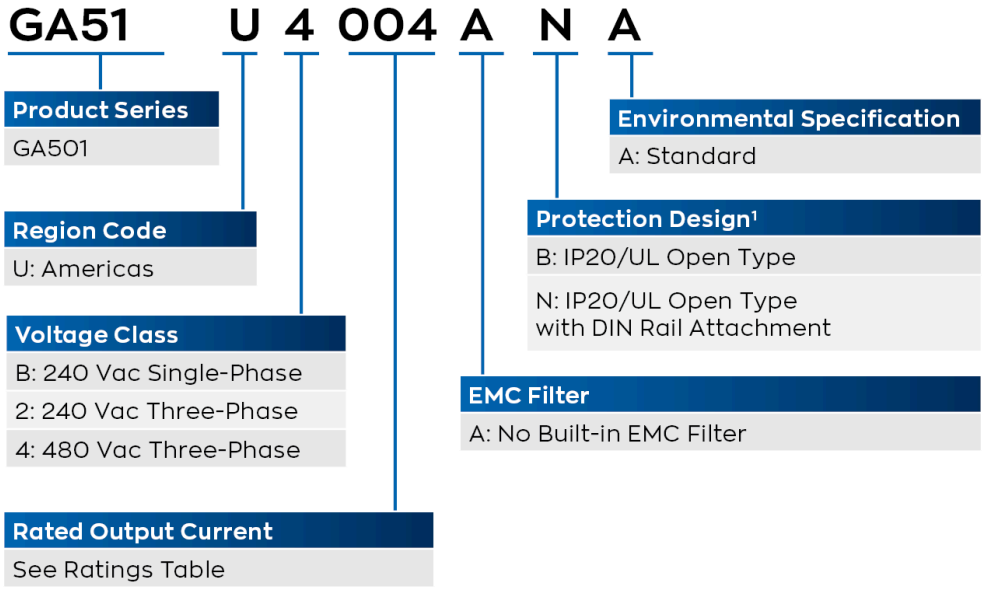
The GA501 includes six built-in protocols including Ethernet communication, supporting EtherNet/IP™,PROFINET®, Modbus TCP/IP, EtherCAT®, BACnet/IP®, MECHATROLINK-4, enabling seamless network integration without additional option cards.

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

Standard (IP20/Protected Chassis) drives are intended for clean environments and can be mounted 2 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.

The GA501 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.



Note 1: The DIN rail attachment "N" is standard on models up to and including 7.5 HP. (Up to _B018ANA, _2021ANA, _4012ANA). DIN rail attachment "N" is not available on models above 7.5 HP. Protection Design "B" IP20/UL Open Type is not offered on models 7.5 HP and below.

Figure 10.1 Catalog Code

Table 10.1 240 V, Single-Phase Input, IP20/Protected Chassis Drives, 1/6 to 5 HP

Normal Duty Output *1		Heavy Duty Output *1		Standard IP20 Drives *2
HP	Amps	HP	Amps	Catalog Code GA51U *3
1/6	1.2	1/6	0.8	B001ANA
1/4	1.9	1/4	1.6	B002ANA
3/4	3.5	1/2	3	B004ANA
1.5	6	1	5	B006ANA
3	9.6	2	8	B010ANA
3	12.2	3	11	B012ANA
-	-	5	17.5	B018ANA

*1 Output capacities stated are for conditions of single-phase input or DC input.
*2 Standard (IP20/Protected Chassis) Drives are intended for clean environments, and can be mounted 2 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.
*3 Catalog codes ending in -ANA have a DIN rail kit attached.

Table 10.2 240 V, Three-Phase Input, IP20/Protected Chassis Drives, 1/6 to 30 HP

Normal Duty Output *1		Heavy Duty Output *1		Standard IP20 Drives *2
HP	Amps	HP	Amps	Catalog Code GA51U *3
1/6	1.2	1/6	0.8	2001ANA
1/4	1.9	1/4	1.6	2002ANA
3/4	3.5	1/2	3	2004ANA
1.5	6	1	5	2006ANA
3	9.6	2	8	2010ANA
4	12.2	3	11	2012ANA
7.5	21	5	17.6	2021ANA
10	30	7.5	25	2030ABA
15	42	10	33	2042ABA
20	56	15	47	2056ABA
25	70	20	60	2070ABA
30	82	25	75	2082ABA

*1 Output capacities stated are for conditions of 3-phase input or DC input. See Single-Phase Drive Selection for single phase capability.
*2 Standard (IP20/Protected Chassis) Drives are intended for clean environments, and can be mounted 2 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.
*3 Catalog codes ending in -ANA have a DIN rail kit attached. Catalog codes ending in -ABA do not have a DIN rail kit attached.

Table 10.3 480 V, Three-Phase Input, IP20/Protected Chassis Drive, 1/2 to 40 HP

Normal Duty Output *1		Heavy Duty Output *1		Standard IP20 Drives *2
HP	Amps	HP	Amps	Catalog Code GA51U *3
1/2	1.2	1/2	1.2	4001ANA
1	2.1	3/4	1.8	4002ANA
2	4.1	2	3.4	4004ANA
3	5.4	3	4.8	4005ANA
4	7.1	3	5.6	4007ANA
5	8.9	4	7.3	4009ANA

Normal Duty Output *1		Heavy Duty Output *1		Standard IP20 Drives *2
HP	Amps	HP	Amps	Catalog Code GA51U *3
7.5	11.9	5	9.2	4012ANA
10	17.5	10	14.8	4018ABA
15	23.4	10	18	4023ABA
20	31	15	24	4031ABA
25	38	20	31	4038ABA
30	44	25	39	4044ABA
40	60	30	45	4060ABA

*1 Output capacities stated are for conditions of 3-phase input or DC input. See Single-Phase Input Drive Selection for single phase capability.
*2 Standard (IP20/Protected Chassis) Drives are intended for clean environments, and can be mounted 2 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.
*3 Catalog codes ending in -ANA have a DIN rail kit attached. Catalog codes ending in -ABA do not have a DIN rail kit attached.

Single-Phase Input Derate

Table 10.4 240 V, Single-Phase Input, Three-Phase Output

Catalog Code GA5xU *1 *2	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
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	-
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 10.5 480 V, Single-Phase Input, Three-Phase Output

Catalog Code GA5xU *1 *2	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	-
4002	1/4	0.6	1/3	0.8	URX000291	URX000651	URX000036	-
4004	1/2	1.1	1	2.1	URX000299	URX000410	URX000040	-
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 the Drive tables based on drive type.

11 GA501 Dimensions and Weights

IP20/Protected Chassis Dimensions

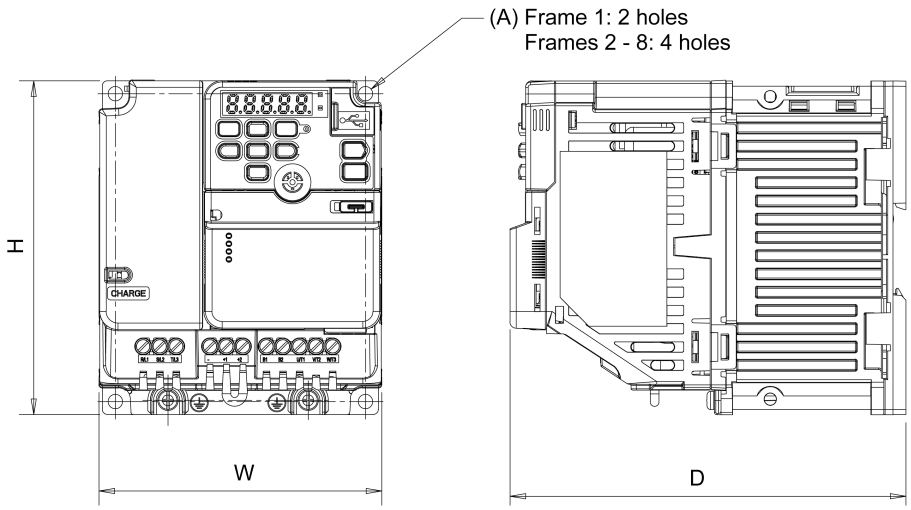


Table 11.1 240 V, Single-Phase Input, IP20/Protected Chassis

Catalog Code GA51U	Normal Duty Output		Heavy Duty Output		Dimensions (in.) *1			Weight (lbs.) *2	Drawing (By Frame #)	
	HP	Amps	HP	Amps	H	W	D		2D	3D
B001ANA	1/6	1.2	1/6	0.8	5.04	2.68	3.56	1.3	1.1	1.1A
B002ANA	1/4	1.9	1/4	1.6						
B004ANA	3/4	3.5	1/2	3			5.22	2	1.3	1.3
B006ANA	1.5	6	1	5		4.27	5.98	3.5	2.4	2.4A
B010ANA	3	9.6	2	8			6.63		2.5	2.5A
B012ANA	3	12.2	3	11		5.53	6.99	5.1	3.2	3.2
B018ANA	-	-	5	17.6		6.69	7.56	7.1	4	4

*1 Dimensions listed are for reference only. Please refer to the corresponding dimensional drawing (DD) for exact dimensions.
*2 This data represents the drive weight only, not shipping weight.

Table 11.2 240 V, Three-Phase Input, IP20/Protected Chassis

Catalog Number GA51U	Normal Duty Output		Heavy Duty Output		Dimensions (in.) *1			Weight (lbs.) *2	Drawing (By Frame #)	
	HP	Amps	HP	Amps	H	W	D		2D	3D
2001ANA	1/6	1.2	1/6	0.8	5.04	2.68	3.56	1.3	1.1	1.1B
2002ANA	1/4	1.9	1/4	1.6						
2004ANA	3/4	3.5	1/2	3			4.82	2.0	1.2	1.2
2006ANA	1.5	6	1	5			5.61	2.2	1.4	1.4
2010ANA	3	9.6	2	8		4.27	5.65	3.5	2.3	2.3
2012ANA	4	12.2	3	11			5.98		2.4	2.4B
2021ANA	7.5	21	5	17.6		5.53	6.2	5.1	3.1	3.1
2030ABA	10	30	7.5	25	10.24	5.51	5.75	7.5	5	5A
2042ABA	15	42	10	33				7.9		5B

Catalog Number GA51U	Normal Duty Output		Heavy Duty Output		Dimensions (in.) *1			Weight (lbs.) *2	Drawing (By Frame #)	
	HP	Amps	HP	Amps	H	W	D		2D	3D
2056ABA	20	56	15	47	11.81	7.09	5.87	12.1	6	6A
2070ABA	25	70	20	60	13.78	8.66	7.6	16.5	7	7
2082ABA	30	82	25	75				17.6		

*1 Dimensions listed are for reference only. Please refer to the corresponding dimensional drawing (DD) for exact dimensions.
*2 This data represents the drive weight only, not shipping weight.

Table 11.3 480 V, Three-Phase Input, IP20/Protected Chassis

Catalog Number GA51U	Normal Duty Output		Heavy Duty Output		Dimensions (in.) *1			Weight (lbs.) *2	Drawing (By Frame #)	
	HP	Amps	HP	Amps	H	W	D		2D	3D
4001ANA	1/2	1.2	1/2	1.2	5.04	4.27	3.76	2	2.1	2.1
4002ANA	1	2.1	3/4	1.8			4.47	2.2	2.2	2.2
4004ANA	2	4.1	2	3.4			5.98	3.5	2.4	2.4C
4005ANA	3	5.4	3	4.8			6.63		2.5	2.5B
4007ANA	4	7.1	3	5.6						
4009ANA	5	8.9	4	7.3						
4012ANA	7.5	11.9	5	9.2		5.53	6.2	5.1	3.1	3.1
4018ABA	10	17.5	10	14.8	10.24	5.51	5.75	6.6	5	5A
4023ABA	15	23.4	10	18				7.1		
4031ABA	20	31	15	24	11.81	7.09	5.87	10.1	6	6B
4038ABA	25	38	20	31				10.6		
4044ABA	30	44	25	39	13.78	7.48	8.27	15.4	8	8
4060ABA	40	60	30	45						

*1 Dimensions listed are for reference only. Please refer to the corresponding dimensional drawing (DD) for exact dimensions.
*2 This data represents the drive weight only, not shipping weight.

12 GA501 Specifications

Operating Environment	
Item	**Specification**
Ambient Temperature	-10 to +50 °C (IP20/Protected Chassis), up to +60 °C with derating
Storage Temperature	-20 to +70 °C (short-term temperature during transportation)
Humidity	95% RH or less (non-condensing)
Altitude	Up to 1000 m without derating, up to 4000 m with derating
Vibration	Without DIN rail attachment: 10 to 20 Hz: 9.8 m/s^2 ; 20 to 55 Hz: 5.9 m/s^2
	With DIN rail attachment: 10 to 20 Hz: 3.9 m/s^2 ; 20 to 55 Hz: 2 m/s^2
Protection Design	IP20/Protected Chassis (Standard)
Mounting	Side-by-side, DIN rail up to 7.5 HP, external heatsink
Conformal Coating (PCBs)	IEC 60721-3-3, Class 3C2 (chemical gases), Class 3S2 (solid particles)
Standards	CE, UL, cUL, RCM, EAC, RoHS
Functional Safety	IEC/EN 61800-5-2: STO, IEC/EN 61508: SIL3, EN ISO 13849-1: PLe

Power Ratings	
Item	**Specification**
Overload Capacity	110%/1 min. (Normal Duty) or 150%/1 min. (Heavy Duty)
Rated Voltage	200 to 240 V, -15 to +10%
	380 to 480 V, -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 22 kW)
	480 V, Three-Phase: 1/2 to 40 HP (0.4 to 30 kW)
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 (PM), EZ Open Loop Vector
Motor Control	Induction Motor (IM), Interior or Surface Permanent Magnet Motor (IPM/SPM), Synchronous Reluctance Motor (SynRM)
Standard I/O	(2) Multi-function digital inputs (24 Vdc)
	(1) Multi-function analog input (0 to -10 Vdc)
	(2) Safe Torque Off (STO) inputs
	(1) Relay output (form C)
Terminal Type	I/O: Spring tension type; Main circuit: Cage clamp screw-type
Communications	Dual Port: EtherNet/IP™, PROFINET®, Modbus TCP/IP, EtherCAT® BACnet/IP®, MECHATROLINK-4
Additional Functions	Integrated PID controller with sleep function, automatic load distribution for multiple axes (droop control), automatic main power loss ride through, speed search function for smooth start of coasting motors, braking with over-magnetization for fast stop without braking resistors, energy-saving function, automatic restart after failure, overvoltage suppression, virtual input/output custom configuration, application presets, vibration suppression

Options	
Item	**Specification**
Additional Options	Bluetooth keypad, LCD keypad, Remote keypad mounting attachments, Attachment for external heatsink, External EMC filters, AC reactors, DC chokes, braking resistors

13 GA501 Keypads, Accessories, and Cables

Additional Information
Keypads and Cables

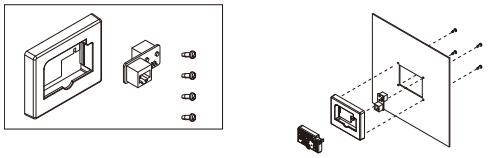
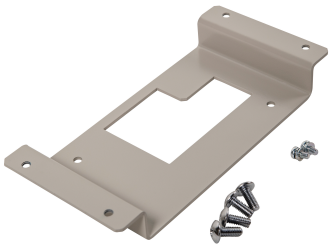
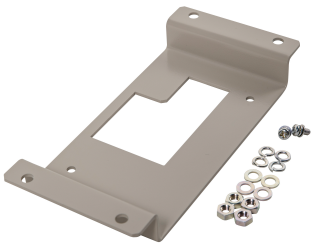
Keypads

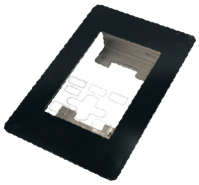
Part Number	Option	Purpose
JVOP-KPLCA04MEB	Local/Remote Keypad	Standard LCD Local/Remote Keypad (standard, non-Bluetooth)
JVOP-KPLCC04MBB	Bluetooth Keypad	LCD Keypad with Bluetooth for use with DriveWizard Mobile

Standard LCD Keypad

LCD Keypad with Bluetooth

Remote Mount Adapters

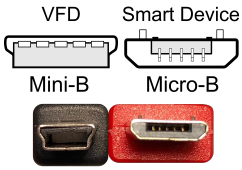
Part Number	Option	Representation
ZPBA-GA500	UL Type 1 LED keypad mounting kit for the standard keypad	
JVOP-KPBCH04AAA	Blank LED keypad when external mounting standard keypad (optional)	
900-192-933-001	Type 1 LCD Keypad Panel Mount Kit A (brackets have tapped holes for use with screws)	
900-192-933-002	Type 1 LCD Keypad Panel Mount Kit B (brackets have untapped holes for use with panel studs)	

Part Number	Option	Representation
900-239-230-001	Type 12/3R LCD Keypad Panel Mount (with embedded studs)	
UUX001955	Type 4X LCD Keypad Panel Mount Kit	

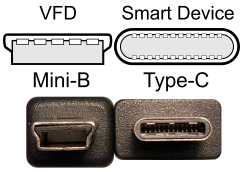
Cables

Part Number	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

Part Number	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.



Part Number: UWR01516-B - USB Mini-B to USB Micro-B



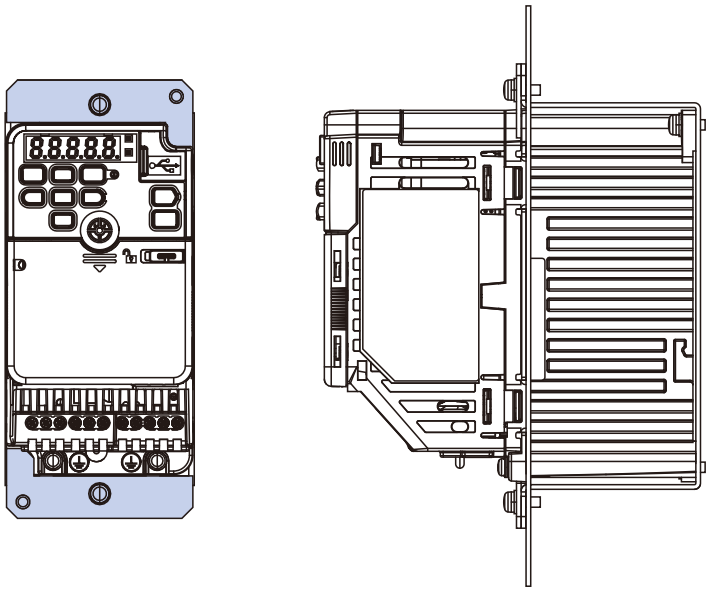
Part Number: UWR01516-C - USB Mini-B to USB Type-C

14 GA501 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.

Additional Information
Enclosure Adapters and Kits

External Heatsink Adapters



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

Table 14.1 240 V, Single-Phase, Drive Mounting Adapters

Catalog Code GA51U	External Heatsink Adapter
	Catalog Code
B001ANA	ZPSA-GA50V1-1
B002ANA	ZPSA-GA50V1-1
B004ANA	ZPSA-GA50V1-2
B006ANA	ZPSA-GA50V2-2
B010ANA	ZPSA-GA50V2-3
B012ANA	ZPSA-GA50V3-1
B018ANA	ZPSA-GA50V4-1

Table 14.2 240 V, Three-Phase, Drive Mounting Adapters

Catalog Code GA51U	External Heatsink Adapter
	Catalog Code
2001ANA	ZPSA-GA50V1-1
2002ANA	ZPSA-GA50V1-1
2004ANA	ZPSA-GA50V1-2
2006ANA	ZPSA-GA50V1-3
2010ANA	ZPSA-GA50V2-3
2012ANA	ZPSA-GA50V2-3

Catalog Code GA51U	External Heatsink Adapter
	Catalog Code
2021ANA	ZPSA-GA50V3-1
2030ABA	ZPSA-GA50V5-1
2042ABA	ZPSA-GA50V5-1
2056ABA	ZPSA-GA50V6-1
2070ABA	ZPSA-GA50V7-1
2082ABA	ZPSA-GA50V7-1

Table 14.3 480 V, Three-Phase, Drive Mounting Adapters

Catalog Code GA51U	External Heatsink Adapter
	Catalog Code
4001ANA	ZPSA-GA50V2-1
4002ANA	ZPSA-GA50V2-2
4004ANA	ZPSA-GA50V2-2
4005ANA	ZPSA-GA50V2-3
4007ANA	ZPSA-GA50V2-3
4009ANA	ZPSA-GA50V2-3
4012ANA	ZPSA-GA50V3-1
4018ABA	ZPSA-GA50V5-1
4023ABA	ZPSA-GA50V5-1
4031ABA	ZPSA-GA50V6-1
4038ABA	ZPSA-GA50V6-1
4044ABA	ZPSA-GA50V8-1
4060ABA	ZPSA-GA50V8-1

Shield Clamp Kit

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

Table 14.4 Single-Phase IP20/Protected Chassis without EMC Filter Shield Clamp Kit

Catalog Code GA51U	Shield Clamp Kit
	Catalog Code
B001ANA	ZHZ-GA50V1
B002ANA	
B004ANA	
B006ANA	ZHZ-GA50V2
B010ANA	
B012ANA	ZHZ-GA50V3
B018ANA	ZHZ-GA50V4

Table 14.5 240 V, Three-Phase IP20/Protected Chassis without EMC Filter, Shield Clamp Kit

Catalog Code GA51U	Shield Clamp Kit
	Catalog Code
2001ANA	ZHZ-GA50V1
2002ANA	
2004ANA	
2006ANA	
2010ANA	ZHZ-GA50V2
2012ANA	
2021ANA	ZHZ-GA50V3
2030ABA	ZHZ-GA50V5
2042ABA	
2056ABA	ZHZ-GA50V6
2070ABA	ZHZ-GA50V7
2082ABA	

Table 14.6 480 V, Three-Phase IP20/Protected Chassis without EMC Filter, Shield Clamp Kit

Catalog Code GA51U	Shield Clamp Kit
	Catalog Code
4001ANA	ZHZ-GA50V2
4002ANA	
4004ANA	
4005ANA	
4007ANA	
4009ANA	
4012ANA	ZHZ-GA50V3
4018ABA	ZHZ-GA50V5
4023ABA	
4031ABA	ZHZ-GA50V6
4038ABA	
4044ABA	ZHZ-GA50V8
4060ABA	

15 GA501 Power Options

Power options are add-on devices that can be used to help increase power factor, improve harmonics, and accommodate single-phase input power.

Name	Purpose
EMC Filters	• IP20 rated • Install external EMC filters to the drive input to comply with C2 levels of the EN 61800-3 EMC directive. • Provides electrical noise mitigation on the input side of the drive.
DC Bus Reactor	• Improves the drive input power factor. • 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. • Decreases harmonic current • Improves the power supply total power factor.
AC Reactor	• Improves the drive input power factor. • 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. • Decreases harmonic current • Improves the power supply total power factor.
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
GA501 Power Options

EMC Filters

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

Table 15.1 240 V, Single-Phase EMC Filters

Catalog Code GA5xU	Part Number
B001	FS23638-10-07
B002	FS23638-10-07
B004	FS23638-10-07
B006	FS23638-20-07
B010	FS23638-20-07

Catalog Code GA5xU	Part Number
B012	FS23638-30-07
B018	FS23638-40-07

Table 15.2 240 V, Three-Phase EMC Filters

Catalog Code GA5xU	Part Number
2001	FS23637-8-07
2002	FS23637-8-07
2004	FS23637-8-07
2006	FS23637-8-07
2010	FS23637-14-07
2012	FS23637-14-07
2021	FS23637-24-07
2030	FS5973-35-07
2042	FS5973-60-07
2056	FS5973-100-07
2070	FS5973-100-07
2082	Contact Factory

Table 15.3 480 V, Three-Phase EMC Filters

Catalog Code GA5xU	Part Number
4001	FS23639-5-07
4002	FS23639-5-07
4004	FS23639-5-07
4005	FS23639-10-07
4007	FS23639-10-07
4009	FS23639-10-07
4012	FS23639-15-07
4018	FS5972-35-07
4023	FS5972-35-07
4031	FS5972-60-07
4038	FS5972-60-07
4044	Contact Factory
4060	

EMC Filter Dimensions

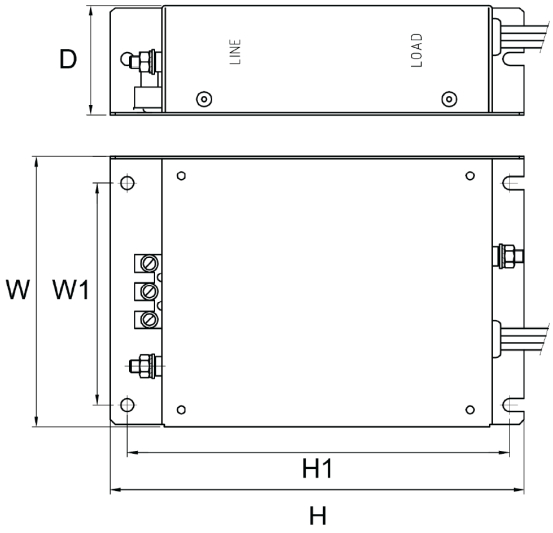


Table 15.4 EMC Filter Dimensions

Dimensions (mm)						
Model Number	H	W	D	H1	W1	Weight (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	0.88
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 15.5 240 V, Three-Phase DC Bus Reactors

HP	Catalog Code GA5xU		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	-	URX000072	URX000266	URX000073	URX000265

Table 15.6 480 V, Three-Phase DC Bus Reactors

HP	Catalog Code GA5xU		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

HP	Catalog Code GA5xU		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
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	-	URX000073	URX000265	URX000071	-

Open Type DC Bus Reactor Dimensions

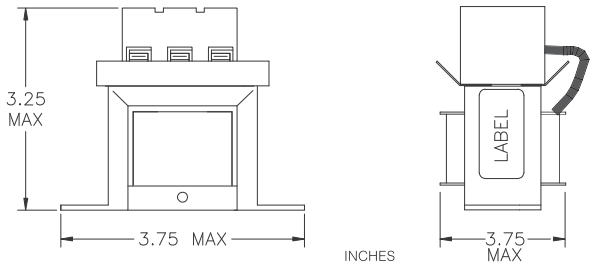


Figure 15.1 Reactor 1

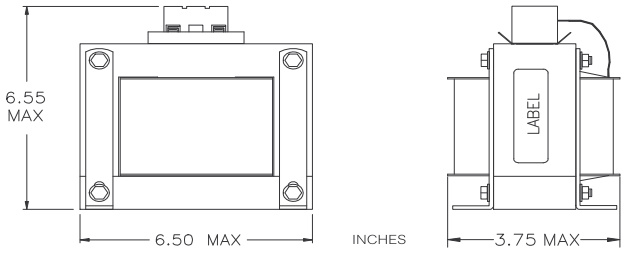


Figure 15.2 Reactor 2

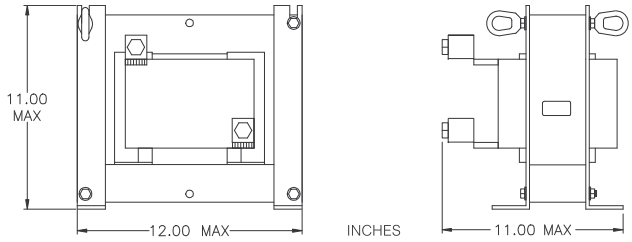


Figure 15.3 Reactor 3

Table 15.7 Open Type DC Reactor Dimensions

DC Bus Reactor	Figure
05P00620-0109	Figure 15.1
05P00620-0110	Figure 15.1
05P00620-0111	Figure 15.2
05P00620-0115	Figure 15.2
05P00652-0213	Figure 15.2
05P00652-0216	Figure 15.2
URX000039	Figure 15.1
URX000041	Figure 15.1
URX000042	Figure 15.2
URX000044	Figure 15.2

DC Bus Reactor	Figure
URX000046	Figure 15.2
URX000048	Figure 15.2
URX000049	Figure 15.2
URX000052	Figure 15.2
URX000053	Figure 15.2
URX000054	Figure 15.2
URX000055	Figure 15.2
URX000056	Figure 15.2
URX000057	Figure 15.2
URX000058	Figure 15.2

DC Bus Reactor	Figure
URX000059	Figure 15.2
URX000064	Figure 15.2
URX000068	Figure 15.3
URX000071	Figure 15.3

DC Bus Reactor	Figure
URX000072	Figure 15.3
URX000073	Figure 15.3
URX000371	Figure 15.2

Enclosed DC Reactor Dimensions

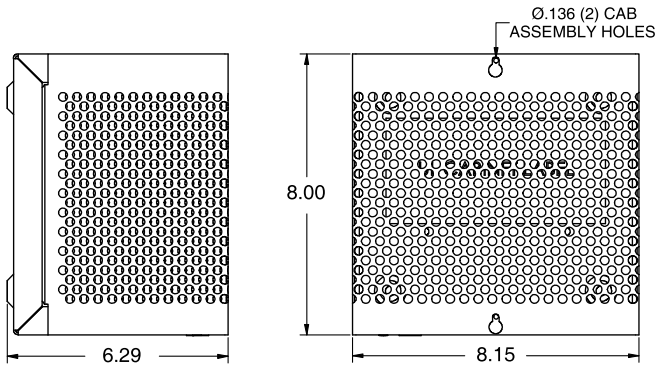


Figure 15.4 CAB-8

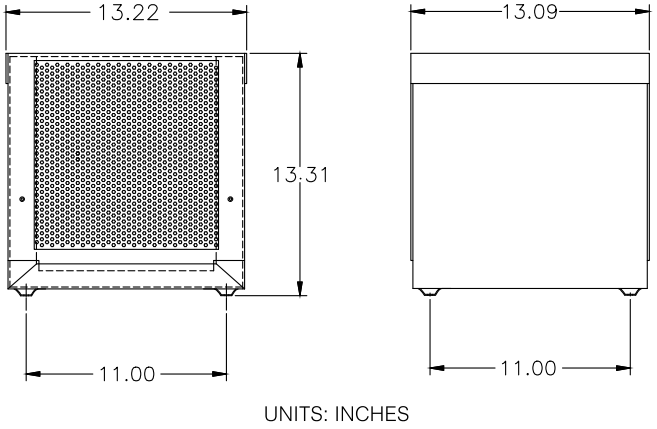


Figure 15.5 CAB-13V

Table 15.8 Enclosed UL Type 1 DC Reactor Dimensions

DC Bus Reactor	Figure
URX000184	Figure 15.4
URX000207	Figure 15.4
URX000208	Figure 15.4
URX000209	Figure 15.4
URX000210	Figure 15.4
URX000211	Figure 15.4
URX000212	Figure 15.4
URX000213	Figure 15.5
URX000214	Figure 15.5
URX000215	Figure 15.4
URX000216	Figure 15.4
URX000217	Figure 15.4
URX000218	Figure 15.4

DC Bus Reactor	Figure
URX000219	Figure 15.4
URX000220	Figure 15.4
URX000221	Figure 15.4
URX000223	Figure 15.5
URX000224	Figure 15.5
URX000225	Figure 15.5
URX000257	Figure 15.4
URX000258	Figure 15.4
URX000259	Figure 15.4
URX000260	Figure 15.5
URX000262	Figure 15.4
URX000265	Figure 15.5
URX000266	Figure 15.5

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 15.9 240 V, Single-Phase, AC Input Reactors

HP	Catalog Code GA5xU		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	-	B018	URX000319	URX000420	URX000320	URX000421
5	-	B018	URX000319	URX000420	URX000320	URX000421

Table 15.10 240 V, Three-Phase, AC Input Reactors

HP	Catalog Code GA5xU		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	URX000311	URX000415	URX000312	URX000416
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

HP	Catalog Code GA5xU		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
25	2070	2082	URX000332	URX000426	URX000333	URX000554
30	2082	-	URX000335	URX000427	URX000336	URX000555

Table 15.11 480 V, Three-Phase, AC Input Reactor

HP	Catalog Code GA5xU		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	-	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 15.12 240 V, Single-Phase, AC Output Reactors

HP	Catalog Code GA5xU		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	-	B018	05P00620-0134	05P00620-0032
5	-	B018	05P00620-0136	05P00620-0036

Table 15.13 240 V, Three-Phase, AC Output Reactors

HP	Catalog Code GA5xU		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

HP	Catalog Code GA5xU		3% Output Reactor	
	Normal Duty	Heavy Duty	Open Type	Enclosed UL Type 1
			Catalog Code	Catalog Code
25	2070	2082	05P00620-0143	05P00620-0058
30	2082	-	URX000085	URX000204

Table 15.14 480 V, Three-Phase, AC Output Reactors

HP	Catalog Code GA5xU		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	-	05P00620-0142	05P00620-0055

AC Open Reactor Dimensions & Weights

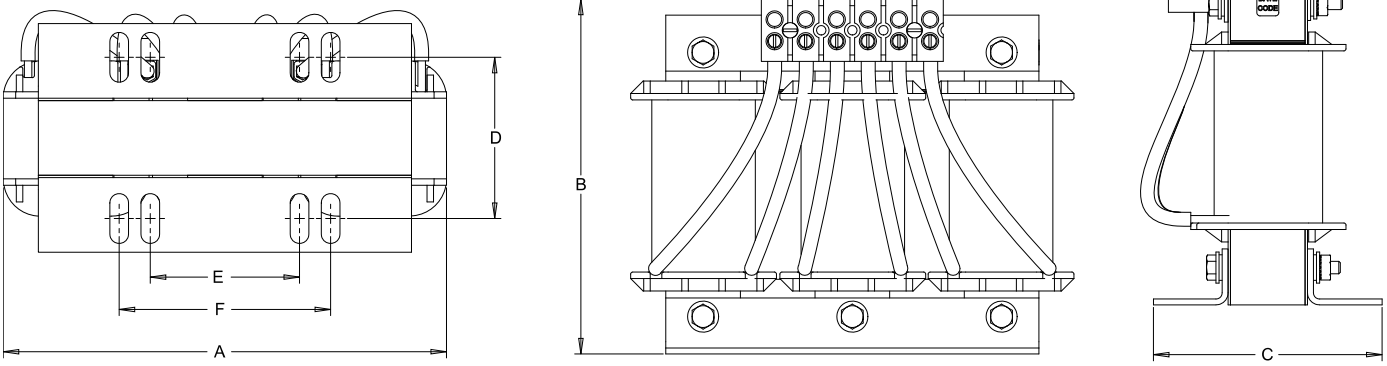


Table 15.15 AC Open Reactor Dimensions

Open Type Reactor Catalog Code	Watt Loss	Dimensions (mm/in)						Weight kg/lb
		A	B	C	D	E	F	
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	-	-	101.6/4	0.9/2
URX000281	8.8	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000283	4.8	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000284	7.8	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000288	10.9	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2

Open Type Reactor Catalog Code	Watt Loss	Dimensions (mm/in)						Weight kg/lb
		A	B	C	D	E	F	
URX000289	15	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000291	9	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000292	14.3	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000295	12.3	114.3/4.5	94/3.7	38.1/1.5	-	-	101.6/4	0.9/2
URX000296	19.6	114.3/4.5	94/3.7	38.1/1.5	-	-	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	-	-	101.6/4	0.9/2
URX000300	23	114.3/4.5	94/3.7	38.1/1.5	-	-	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	-	-	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	-	76.2/3	5.9/13
URX000325	122	180.3/7.1	147.3/5.8	106.7/4.2	81.3/3.2	-	76.2/3	8.2/18
URX000327	100	180.3/7.1	144.8/5.7	106.7/4.2	81.3/3.2	-	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	-	76.2/3	8.2/18
URX000330	110	180.3/7.1	142.2/5.6	142.2/5.6	81.3/3.2	-	76.2/3	9.1/20
URX000332	87	180.3/7.1	142.2/5.6	127/5	81.3/3.2	-	76.2/3	8.2/18
URX000333	105	180.3/7.1	144.8/5.7	152.4/6	81.3/3.2	-	76.2/3	18 (8.2)
URX000335	119	180.3/7.1	142.2/5.6	149.9/5.9	81.3/3.2	-	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

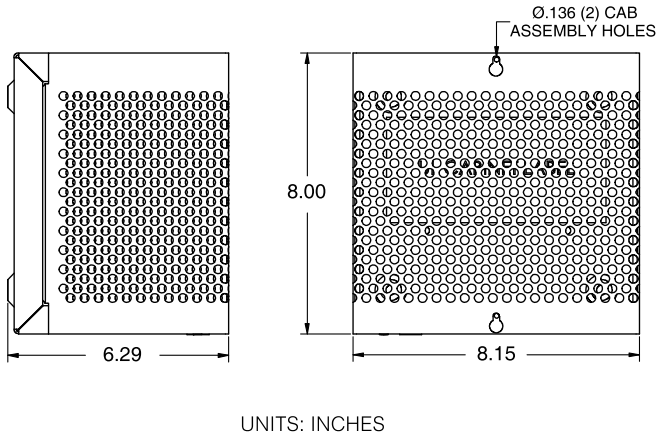


Figure 15.6 CAB-8

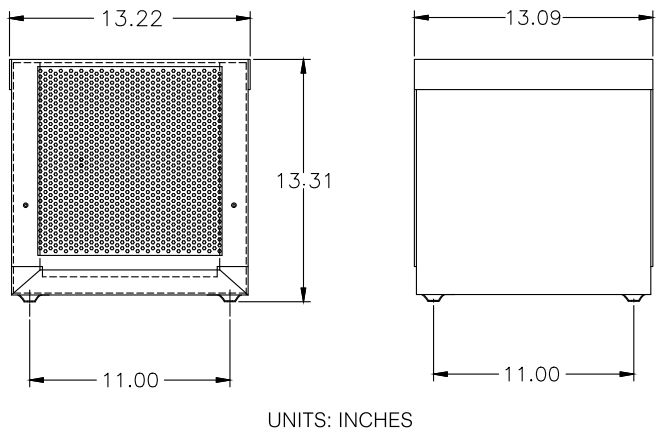


Figure 15.7 CAB-13V

Table 15.16 Enclosed, Input/Output AC Reactor Specifications

Enclosed UL Type 1 Reactor Catalog Code	Cabinet Reference (Figure)	Weight kg/lb
05P00620-0015	Figure 15.7	12.7 / 28
05P00620-0020		12.9 / 28.4
05P00620-0021		16.3 / 36
05P00620-0027		19.1 / 42
05P00620-0028	Figure 15.7	17.2 / 38
05P00620-0029		18.1 / 40
05P00620-0032		20 / 44
05P00620-0033		24.9 / 55
05P00620-0036	Figure 15.6	3.9 / 8.5
05P00620-0037		3.9 / 8.6
05P00620-0041		3.9 / 8.5
05P00620-0042		3.9 / 8.6
05P00620-0046	Figure 15.6	3.9 / 8.6
05P00620-0047		3.9 / 8.5
05P00620-0050		3.9 / 8.6
05P00620-0051		4.4 / 9.7
05P00620-0054	Figure 15.6	4.4 / 9.8
05P00620-0055		5 / 11.1
05P00620-0058		3.9 / 8.5
URX000204		3.9 / 8.5
URX000242	Figure 15.6	4.6 / 10
URX000243		5 / 10
URX000409		3.9 / 8.6
URX000410		3.9 / 8.7

Enclosed UL Type 1 Reactor Catalog Code	Cabinet Reference (Figure)	Weight kg/lb
URX000411	Figure 15.6	4 / 8.8
URX000413		4.4 / 9.7
URX000414		5.1 / 11.2
URX000415	Figure 15.6	4.4 / 9.8
URX000416		5.1 / 11.3
URX000417		6.4 / 14.1
URX000418	Figure 15.7	10.1 / 22.2
URX000419		11.4 / 25.2
URX000420		10.5 / 23.1
URX000421		12.5 / 27.5
URX000422	Figure 15.7	12.7 / 28
URX000423		14.1 / 31
URX000425		15.9 / 35
URX000426	Figure 15.7	16.3 / 36
URX000427		16.8 / 37
URX000501		16.3 / 36
URX000502	Figure 15.6	3.9 / 8.6
URX000503		4 / 8.8
URX000504		4.4 / 9.8
URX000505	Figure 15.6	5.6 / 12.3
URX000551		3.9 / 8.6
URX000552		4.4 / 9.8
URX000553	Figure 15.7	17.2 / 38
URX000554		18.1 / 40
URX000555		20 / 44
URX000568		12.7 / 28
URX000571	Figure 15.6	3.9 / 8.6
URX000573		4.4 / 9.7
URX000574		5 / 11.1
URX000575	Figure 15.7	12.9 / 28.4
URX000576		16.3 / 36
URX000577		19.1 / 42
URX000584	Figure 15.6	3.9 / 8.6
URX000585		3.9 / 8.6
URX000651		3.9 / 8.5
URX000652	Figure 15.6	3.9 / 8.5
URX000653		3.9 / 8.5
URX000654		3.9 / 8.5

Dynamic Braking Options

Additional Information	
Braking Resistor Specifications	Braking Resistor Drawings
Braking Connection Diagrams	

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 15.17 240 V, Single-Phase, 10% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	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
-	5	B018	USR000025	1

Table 15.18 240 V, Three-Phase, 10% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	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

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	10% Dynamic Braking Option (max 10 second on-time)	
			Resistor	
			Catalog Code	Quantity
25	20	2070	URS000136	1
30	25	2082	URS000136	1

Table 15.19 480 V, Three-Phase, 10% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	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

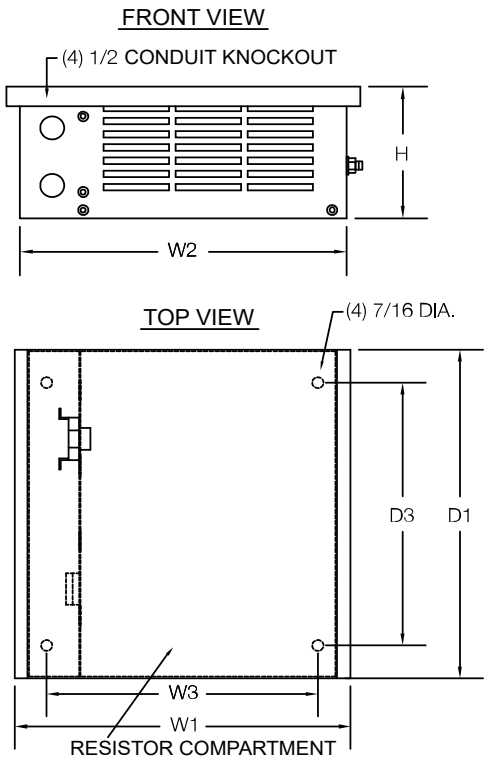
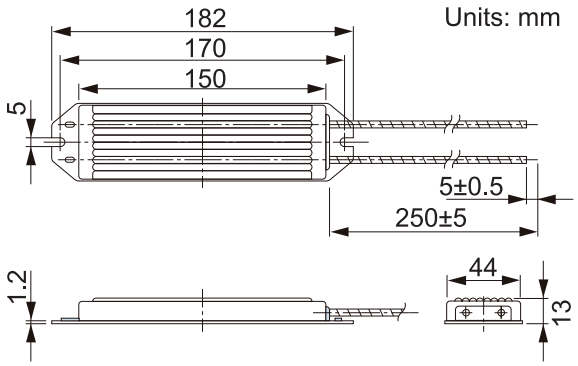


Table 15.20 GCE Type Enclosure Dimensions

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 (0.44 lbs)
(All ERF-150WJx Series Models)

Table 15.21 240 V, Single-Phase, 3% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	Resistor *1	
			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
-	5	B018	R7510	2

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

Table 15.22 240 V, Three-Phase, 3% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	Resistor *1	
			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 15.23 480 V, Three-Phase, 3% Dynamic Braking Options

Normal Duty HP	Heavy Duty HP	Catalog Code GA5xU	Resistor *1	
			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	
R1000 Product Page	Flyer
Drawings	Manual

Each R1000 regenerative unit system requires these 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 tables.

Table 15.24 240 V R1000 Kits

240 V Regenerative Kit Number	System Capacity	R1000 Model Number in Kit CIMR-RU	Enclosure Type
	Maximum Applicable Motor Capacity (HP) *1		
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	

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

Table 15.25 480 V R1000 Kits

480 V Regenerative Kit Number	System Capacity	R1000 Model Number in Kit CIMR-RU	Enclosure Type
	Maximum Applicable Motor Capacity (HP) *1		
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	

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

R1000 Power Regenerative Units

Each R1000 regenerative unit system requires these 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 *1 100% / 80%	Part Number Yaskawa (MTE)	Part Number Yaskawa (MTE)	Part Number Yaskawa (Mersen)	Qty. Req.	Part Number Yaskawa (Mersen)
3.5 (5)	2A03P5FAA *2	10/8	05P00620-0134 (RL-01201)	05P00620-0136 (RL-01801)	FU-002031 (A60Q20-2)	1	FU-002055 (30323)
5 (7)	2A0005FAA *2	15/12	URX000083 (RL-02501)	05P00620-0138 (RL-02502)	FU-002031 (A60Q20-2)	1	FU-002055 (30323)
7 (9)	2A0007FAA *2	20/16	URX000083 (RL-02501)	05P00620-0044 (RL-03501)	FU-002032 (A60Q30-2)	1	FU-002055 (30323)
10 (13)	2A0010FAA *2	30/24	05P00620-0044 (RL-03501)	05P00620-0140 (RL-04501)	UFU000153 (A30QS50-4)	3	FU-002082 (P243G)
14 (19)	2A0014FAA *2	41/33	05P00620-0141 (RL-05501)	05P00620-0141 (RL-05501)	UFU000479 (A30QS60-4)	3	FU-002082 (P243G)
17 (23)	2A0017FAA *2	50/40	05P00620-0143 (RL-08001)	05P00620-0143 (RL-08001)	UFU000154 (A30QS80-4)	3	FU-002083 (P243)
20 (27)	2A0020FAA *2	60/48	URX000085 (RL-10001)	05P00620-0143 (RL-08001)	UFU000155 (A30QS100-4)	3	FU-002083 (P243)

*1 100% for 1 minute, (25% ED) / 80% continuous, ED = Duty Cycle.
*2 IP20/NEMA 1enclosure.
*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 *1 100% / 80%	Part Number Yaskawa (MTE)	Part Number Yaskawa (MTE)	Part Number Yaskawa (Mersen)	Qty. Req.	Part Number Yaskawa (Mersen)
3.5 (5)	4A03P5FAA *2	5/4	05P00620-0025 (RL-00803)	05P00620-0133 (RL-00802)	FU-002030 (A60Q15-2)	1	FU-002055 (30323)
5 (7)	4A0005FAA *2	8/6	05P00620-0133 (RL-00802)	05P00620-0135 (RL-01202)	FU-002030 (A60Q15-2)	1	FU-002055 (30323)
7 (9)	4A0007FAA *2	11/9	05P00620-0135 (RL-01202)	05P00620-0137 (RL-01802)	FU-002030 (A60Q15-2)	1	FU-002055 (30323)
10 (13)	4A0010FAA *2	16/13	05P00620-0137 (RL-01802)	05P00620-0138 (RL-02502)	FU-002032 (A60Q30-2)	1	FU-002055 (30323)
14 (19)	4A0014FAA *2	22/18	URX000083 (RL-02501)	05P00620-0139 (RL-03502)	FU-002032 (A60Q30-2)	1	FU-002055 (30323)
17 (23)	4A0017FAA *2	27/22	05P00620-0044 (RL-03501)	05P00620-0139 (RL-03502)	FU-000783 (A50P50-4)	3	FU-002082 (P243G)
20 (27)	4A0020FAA *2	32/26	05P00620-0049 (RL-04502)	05P00620-0049 (RL-04502)	FU-000783 (A50P50-4)	3	FU-002082 (P243G)
28 (38)	4A0028FAA *2	43/34	05P00620-0142 (RL-05502)	05P00620-0142 (RL-05502)	UFU000480 (A50P60-4)	3	FU-002082 (P243G)

*1 100% for 1 minute, (25% ED) / 80% continuous, ED = Duty Cycle.
*2 IP20/NEMA 1enclosure.
*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 heatsink external (NEMA 1 backside) to the enclosure. Option kit for customer mounting. Larger standard drives include brackets.

Table 15.26 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	

Table 15.27 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	

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	Item
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% *1
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	
Single-Phase Converter	Manual
Specifications	Drawings

Table 15.28 240 V Single-Phase Converters

System Kit Number *1	System Capacity			Component Name	Component Part Number
	Maximum Total Motor Load HP (kW)	Maximum Continuous			
	Rated Power HP *2	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 (37)	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

*1 The kit includes Open Type/Protected Chassis Single-Phase Converter and DC link choke.
*2 The larger power Single-Phase Converter unit can be used on lower power motors.

Table 15.29 480 V Single-Phase Converters

System Kit Number *1	System Capacity			Component Name	Component Part Number
	Maximum Total Motor Load HP (kW)	Maximum Continuous			
	Rated Power HP *2	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

*1 The kit includes Open Type/Protected Chassis Single-Phase Converter and DC link choke.
*2 The larger power Single-Phase Converter unit can be used on lower power motors.

Table 15.30 480 V UL Type 1 Adapters for Single-Phase Converters

Converter Model	Link Choke Part Number	Converter Type 1 Kit Adapter Part Number	Link Choke Type 1 Kit Adapter Part Number
SPBC-2015AAA	URX000530	UUX001686	UUX001688
SPBC-2022AAA	URX000531		
SPBC-2030AAA	URX000532	UUX001687	
SPBC-2037AAA	URX000520	UUX001703	
SPBC-2045AAA	URX000521		
SPBC-4022AAA	URX000534	UUX001686	
SPBC-4030AAA	URX000535		
SPBC-4037AAA	URX000536	UUX001687	
SPBC-4045AAA	URX000537		
SPBC-4056AAA	URX000527	UUX001703	
SPBC-4093AAA	URX000529		

This option consists of a top and bottom cover to convert a Protected Chassis converter and/or DC link choke to a UL Type 1 enclosed unit. This option DOES NOT provide additional space for mounting auxiliary components (i.e., circuit breaker, input fuses, reactor, etc.).

16 Technical Training

Additional Information
Training Home Page

In today's world of global competition, it is impossible for a company to survive without "state-of-the-art" technically trained associates and customers. Yaskawa Technical Training Services (TTS) is comprised of engineers who are specialists in their field.

Yaskawa America has three training facilities in the United States. The primary training facility is in Yaskawa America's North American Headquarters in Waukegan, Illinois (45 miles north of Chicago, 50 miles south of Milwaukee). This facility has six training rooms; two lecture halls, two training rooms and two training labs.

Aside from the possibility of attending training classes in Waukegan and Los Angeles, Yaskawa America can also bring training to the customer. On-site classes are available in two varieties. The first is to duplicate the official training classes at the customer's location. Full functioning demo units, data projector, computer and documentation can be shipped to recreate the official class on-site. The second variety is road show training. Road show training is a one-day training class that is specifically tailored to the students' needs and questions. Only basic demos are used and the topics covered in class are generated by the students in attendance.

The Yaskawa Virtual Training Room is another training option. All you need is an Internet connection and a telephone. This is a live, interactive training class, which gives you the ability to talk to the instructor as well as other students. The Internet connection allows us to show slides and demonstrate software packages. The telephone is for the audio portion of the training class. Web classes can be found on the Yaskawa formal training schedule and can also be done on-demand, per the time and preference of the customer

To enroll, contact Technical Training Services.

Phone: 1-800-YASKAWA (1-800-927-5292), then dial 2 for "Drives" and 4 for "Training"

Email: training@yaskawa.com

17 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.

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YASKAWA

GA500 & GA501 SELECTION GUIDE
AC MICRODRIVES FOR INDUSTRIAL APPLICATIONS

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