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SAFTRONICS

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GP10

General Purpose
Open Loop
Vector AC Drive

5580 Enterprise Parkway, Fort Myers, Florida 33905 • Telephone (941) 693-7200 • Fax (941) 693-2431

TECHNICAL MANUAL

P/N: 027-GP1001SM
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GP10™ Model Number Configurator

Description	GP10	E1ST	3	4	010	A	1

Product Series

Enclosure

E1ST = NEMA 1
E2ST = NEMA 12
E4St = NEMA 4

Input Phases

3 = 3 Phase

Input Voltage

2 = 230V 50/60 Hz
4 = 460V 50/60 Hz

Horsepower

F50 = 1/2 Hp
010 = 10 Hp
100 = 100 Hp

Factory Use

Factory Use

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GP10 Dimensions & Weights

GP10 Variable Torque/Constant Torque (VT/CT)

HP Rating (VT/CT)	NEMA Enclosure	Rated Output Current (A)	Overload (110%/150% 1min.)	GP10 Model No.	Part No.	Dimensions H x W x D (inches)	Weight (lbs)
230VAC, 3 phase, 50/60Hz Input, NEMA 1							
0.25/0.25	1	1.5/1.5	1.7/2.3	GP10E1ST32F25* *	GP102F25-1	10.24 x 4.33 x 5.12	4.8
0.5/0.5	1	3/3	3.3/4.5	GP10E1ST32F50* *	GP102F50-1	10.24 x 4.33 x 5.12	4.8
1/1	1	5/5	5.5/7.5	GP10E1ST32001* *	GP102001-1	10.24 x 4.33 x 5.71	5.5
2/2	1	8/8	8.8/12	GP10E1ST32002* *	GP102002-1	10.24 x 5.91 x 5.71	8.4
3/3	1	11/11	12/17	GP10E1ST32003* *	GP102003-1	10.24 x 5.91 x 5.71	8.4
5/5	1	17/17	19/26	GP10E1ST32005* *	GP102005-1	10.24 x 5.91 x 5.71	8.4
7.5/5	1	22/17	24/26	GP10E1ST32007* *	GP102007-1	10.24 x 8.66 x 7.68	12.6
10/7.5	1	29/25	32/38	GP10E1ST32010 * *	GP102010-1	10.24 x 8.66 x 7.68	12.6
15/10	1	42/33	46/50	GP10E1ST32015 * *	GP102015-1	10.24 x 8.66 x 7.68	12.6
20/15	1	55/45	61/69	GP10E1ST32020 * *	GP102020-1	15.75 x 9.84 x 7.68	22.0
25/20	1	68/59	75/89	GP10E1ST32025 * *	GP102025-1	15.75 x 9.84 x 7.68	22.0
30/25	1	80/74	88/110	GP10E1ST32030 * *	GP102030-1	15.75 x 9.84 x 7.68	23.1
40/30	1	115/87	127/131	GP10E1ST32040 * *	GP102040-1	29.7 x 13.5 x 10.0	70
50/40	1	145/115	160/173	GP10E1ST32050 * *	GP102050-1	29.7 x 13.5 x 10.0	70
60/50	1	180/145	198/218	GP10E1ST32060 * *	GP102060-1	33.1 x 14.9 x 10.6	86
75/60	1	215/180	215/180	GP10E1ST32075 * *	GP102075-1	38.0 x 14.9 x 10.6	106
100/75	1	283/215	283/215	GP10E1ST32100 * *	GP102100-1	38.0 x 14.9 x 10.6	110
125/100	1	346/283	346/283	GP10E1ST32125 * *	GP102125-1	41.3 x 21.0 x 11.2	172
150/125	1	415/346	415/346	GP10E1ST32150 * *	GP102150-1	50.4 x 26.9 x 14.2	282
230VAC, 3 phase, 50/60Hz Input, NEMA 4							
0.25/0.25	4	1.5/1.5	1.7/2.3	GP10E4ST32F25 * *	GP102F25-4	10.24 x 4.33 x 5.12	4.8
0.5/0.5	4	3/3	3.3/4.5	GP10E4ST32F50 * *	GP102F50-4	10.24 x 4.33 x 5.12	4.8
1/1	4	5/5	5.5/7.5	GP10E4ST32001 * *	GP102001-4	10.24 x 4.33 x 5.71	5.5
2/2	4	8/8	8.8/12	GP10E4ST32002 * *	GP102002-4	10.24 x 5.91 x 5.71	8.4
3/3	4	11/11	12/17	GP10E4ST32003 * *	GP102003-4	10.24 x 5.91 x 5.71	8.4
5/5	4	17/17	19/26	GP10E4ST32005 * *	GP102005-4	10.24 x 5.91 x 5.71	8.4
7.5/5	4	22/17	24/26	GP10E4ST32007 * *	GP102007-4	10.24 x 8.66 x 7.68	12.6
10/7.5	4	29/25	32/38	GP10E4ST32010 * *	GP102010-4	10.24 x 8.66 x 7.68	12.6
15/10	4	42/33	46/50	GP10E4ST32015 * *	GP102015-4	10.24 x 8.66 x 7.68	12.6
230VAC, 3 phase, 50/60Hz Input, NEMA 12							
20/15	12	55/45	61/69	GP10E2ST32020 * *	GP102020-2	15.75 x 9.84 x 7.68	22.0
25/20	12	68/59	75/89	GP10E2ST32025 * *	GP102025-2	15.75 x 9.84 x 7.68	22.0
30/25	12	80/74	88/110	GP10E2ST32030 * *	GP102030-2	15.75 x 9.84 x 7.68	23.1
230VAC, 3 phase, 50/60Hz Input, Open							
40/30	Open	115/87	127/131	GP10E9ST32040 * *	GP102040-9	21.7 x 13.4 x 10.0	64
50/40	Open	145/115	160/173	GP10E9ST32050 * *	GP102050-9	21.7 x 13.4 x 10.0	64
60/50	Open	180/145	198/218	GP10E9ST32060 * *	GP102060-9	24.2 x 14.8 x 10.6	79
75/60	Open	215/180	237/270	GP10E9ST32075 * *	GP102075-9	29.1 x 14.8 x 10.6	97
100/75	Open	283/215	311/323	GP10E9ST32100 * *	GP102100-9	29.1 x 14.8 x 10.6	101
125/100	Open	346/283	381/425	GP10E9ST32125 * *	GP102125-9	29.5 x 20.9 x 11.2	154
150/125	Open	415/346	457/519	GP10E9ST32150 * *	GP102150-9	34.6 x 26.8 x 14.2	253

* *Indicates factory use.

Note: Hp rating is shown for 230V and 460V nominal systems.

When applying at lower voltage, select the drive by rated current and not Hp rating.

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GP10 Dimensions & Weights

GP10 Variable Torque/Constant Torque (VT/CT)

HP Rating (VT/CT)	NEMA Enclosure	Rated Output Current (A)	Overload (110%/150% 1min.)	GP10 Model No.	Part No.	Dimensions H x W x D (inches)	Weight (lbs)
230VAC, 3 phase, 50/60Hz Input, Open with NEMA 12 Heatsink							
40/30	Open	115/87	127/131	GP10E8ST32040 * *	GP102040-8	21.7 x 13.4 x 10.0	64
50/40	Open	145/115	160/173	GP10E8ST32050 * *	GP102050-8	21.7 x 13.4 x 10.0	64
60/50	Open	180/145	198/218	GP10E8ST32060 * *	GP102060-8	24.2 x 14.8 x 10.6	79
75/60	Open	215/180	237/270	GP10E8ST32075 * *	GP102075-8	29.1 x 14.8 x 10.6	97
100/75	Open	283/215	311/323	GP10E8ST32100 * *	GP102100-8	29.1 x 14.8 x 10.6	101
125/100	Open	346/283	381/425	GP10E8ST32125 * *	GP102125-8	29.5 x 20.9 x 11.2	154
150/125	Open	415/346	457/519	GP10E8ST32150 * *	GP102150-8	34.6 x 26.8 x 14.2	253
460VAC, 3 phase, 50/60Hz Input, NEMA 1							
0.5/0.5	1	1.5/1.5	1.7/2.3	GP10E1ST34F50 * *	GP104F50-1	10.24 x 4.33 x 5.12	4.8
1/1	1	2.5/2.5	2.8/3.8	GP10E1ST34001 * *	GP104001-1	10.24 x 4.33 x 5.71	5.5
2/2	1	3.7/3.7	4.1/5.6	GP10E1ST34002 * *	GP104002-1	10.24 x 5.91 x 5.71	8.4
3/3	1	5.5/5.5	6.1/8.3	GP10E1ST34003 * *	GP104003-1	10.24 x 5.91 x 5.71	8.4
5/5	1	9/9	9.9/14	GP10E1ST34005 * *	GP104005-1	10.24 x 5.91 x 5.71	8.4
7.5/5	1	12.5/9	14/14	GP10E1ST34007 * *	GP104007-1	10.24 x 8.66 x 7.68	13.4
10/7.5	1	16.5/13	18/20	GP10E1ST34010 * *	GP104010-1	10.24 x 8.66 x 7.68	13.4
15/10	1	23/18	25/27	GP10E1ST34015 * *	GP104015-1	10.24 x 8.66 x 7.68	13.4
20/15	1	30/24	33/36	GP10E1ST34020 * *	GP104020-1	15.75 x 9.84 x 7.68	22.0
25/20	1	37/30	41/45	GP10E1ST34025 * *	GP104025-1	15.75 x 9.84 x 7.68	22.0
30/25	1	44/39	48/59	GP10E1ST34030 * *	GP104030-1	15.75 x 9.84 x 7.68	23.1
40/30	1	60/45	66/68	GP10E1ST34040 * *	GP104040-1	29.7 x 13.5 x 10.0	70
50/40	1	75/60	83/90	GP10E1ST34050 * *	GP104050-1	29.7 x 13.5 x 10.0	70
60/50	1	91/75	100/113	GP10E1ST34060 * *	GP104060-1	29.7 x 14.9 x 10.6	82
75/60	1	112/91	123/137	GP10E1ST34075 * *	GP104075-1	34.6 x 14.9 x 10.6	95
100/75	1	150/112	165/168	GP10E1ST34100 * *	GP104100-1	34.6 x 14.9 x 10.6	97
125/100	1	176/150	194/225	GP10E1ST34125 * *	GP104125-1	38.0 x 14.9 x 10.6	115
150/125	1	210/176	231/264	GP10E1ST34150 * *	GP104150-1	38.0 x 21.0 x 12.4	174
200/150	1	253/210	278/315	GP10E1ST34200 * *	GP104200-1	38.0 x 21.0 x 12.4	174
250/200	1	304/253	334/380	GP10E1ST34250 * *	GP104250-1	53.1 x 21.0 x 14.2	245
300/250	1	377/304	415/456	GP10E1ST34300 * *	GP104300-1	53.1 x 21.0 x 14.2	245
350/300	1	415/377	457/566	GP10E1ST34350 * *	GP104350-1	55.1 x 26.9 x 14.2	337
400/350	1	485/415	534/623	GP10E1ST34400 * *	GP104400-1	55.1 x 26.9 x 14.2	337
450/350	1	520/415	572/623	GP10E1ST34450 * *	GP104450-1	55.1 x 26.9 x 14.2	337
500/400	1	650/520	715/780	GP10E1ST34500 * *	GP104500-1	57.1 x 26.8 x 17.7	562
600/450	1	740/585	814/878	GP10E1ST34600 * *	GP104600-1	57.1 x 26.8 x 17.7	562
700/500	1	840/650	924/975	GP10E1ST34700 * *	GP104700-1	57.1 x 34.6 x 17.7	804
800/600	1	960/740	1056/1110	GP10E1ST34800 * *	GP104800-1	57.1 x 34.6 x 17.7	804
460VAC, 3 phase, 50/60Hz Input, NEMA 4							
0.5/0.5	4	1.5/1.5	1.7/2.3	GP10E4ST34F50##	GP104F50-4	10.24 x 4.33 x 5.12	4.8
1/1	4	2.5/2.5	2.8/3.8	GP10E4ST34001##	GP104001-4	10.24 x 4.33 x 5.71	5.5
2/2	4	3.7/3.7	4.1/5.6	GP10E4ST34002##	GP104002-4	10.24 x 5.91 x 5.71	8.4
3/3	4	5.5/5.5	6.1/8.3	GP10E4ST34003##	GP104003-4	10.24 x 5.91 x 5.71	8.4
5/5	4	9/9	9.9/14	GP10E4ST34005##	GP104005-4	10.24 x 5.91 x 5.71	8.4
7.5/5	4	12.5/9	14/14	GP10E4ST34007##	GP104007-4	10.24 x 8.66 x 7.68	13.4
10/7.5	4	16.5/13	18/20	GP10E4ST34010##	GP104010-4	10.24 x 8.66 x 7.68	13.4
15/10	4	23/18	25/27	GP10E4ST34015##	GP104015-4	10.24 x 8.66 x 7.68	13.4

**Indicates factory use.

Note: Hp rating is shown for 230V and 460V nominal systems.

When applying at lower voltage, select the drive by rated current and not Hp rating.

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GP10 Dimensions & Weights

GP10 Variable Torque/Constant Torque (VT/CT)

HP Rating (VT/CT)	NEMA Enclosure	Rated Output Current (A)	Overload (110%/150% 1min.)	GP10 Model No.	Part No.	Dimensions H x W x D (inches)	Weight (lbs)
460VAC, 3 phase, 50/60Hz Input, NEMA 12							
20/15	12	30/24	33/36	GP10E2ST34020 * *	GP104020-2	15.75 x 9.84 x 7.68	22.0
25/20	12	37/30	41/45	GP10E2ST34025 * *	GP104025-2	15.75 x 9.84 x 7.68	22.0
30/25	12	44/39	48/59	GP10E2ST34030 * *	GP104030-2	15.75 x 9.84 x 7.68	23.1
460VAC, 3 phase, 50/60Hz Input, Open							
40/30	Open	60/45	66/68	GP10E9ST34040 * *	GP104040-9	21.7 x 13.4 x 10.0	64
50/40	Open	75/60	83/90	GP10E9ST34050 * *	GP104050-9	21.7 x 13.4 x 10.0	64
60/50	Open	91/75	100/113	GP10E9ST34060 * *	GP104060-9	21.7 x 14.8 x 10.6	75
75/60	Open	112/91	123/137	GP10E9ST34075 * *	GP104075-9	26.6 x 14.8 x 10.6	86
100/75	Open	150/112	165/168	GP10E9ST34100 * *	GP104100-9	26.6 x 14.8 x 10.6	88
125/100	Open	176/150	194/225	GP10E9ST34125 * *	GP104125-9	29.1 x 14.8 x 10.6	106
150/125	Open	210/176	231/264	GP10E9ST34150 * *	GP104150-9	29.1 x 20.9 x 12.4	154
200/150	Open	253/210	278/315	GP10E9ST34200 * *	GP104200-9	29.1 x 20.9 x 12.4	154
250/200	Open	304/253	334/380	GP10E9ST34250 * *	GP104250-9	39.4 x 20.9 x 14.2	220
300/250	Open	377/304	415/456	GP10E9ST34300 * *	GP104300-9	39.4 x 20.9 x 14.2	220
350/300	Open	415/377	457/566	GP10E9ST34350 * *	GP104350-9	39.4 x 26.8 x 14.2	308
400/350	Open	485/415	534/623	GP10E9ST34400 * *	GP104400-9	39.4 x 26.8 x 14.2	308
450/350	Open	520/415	572/623	GP10E9ST34450 * *	GP104450-9	39.4 x 26.8 x 14.2	308
500/400	Open	650/520	715/780	GP10E9ST34500 * *	GP104500-9	55.1 x 26.8 x 17.7	551
600/450	Open	740/585	814/878	GP10E9ST34600 * *	GP104600-9	55.1 x 26.8 x 17.7	551
700/500	Open	840/650	924/975	GP10E9ST34700 * *	GP104700-9	55.1 x 35.6 x 17.7	793
800/600	Open	960/740	1056/1110	GP10E9ST34800 * *	GP104800-9	55.1 x 35.6 x 17.7	793
460VAC, 3 phase, 50/60Hz Input, Open with NEMA 12 Heatsink							
40/30	Open	60/45	66/68	GP10E8ST34040 * *	GP104040-8	21.7 x 13.4 x 10.0	64
50/40	Open	75/60	83/90	GP10E8ST34050 * *	GP104050-8	21.7 x 13.4 x 10.0	64
60/50	Open	91/75	100/113	GP10E8ST34060 * *	GP104060-8	21.7 x 14.8 x 10.6	75
75/60	Open	112/91	123/137	GP10E8ST34075 * *	GP104075-8	26.6 x 14.8 x 10.6	86
100/75	Open	150/112	165/168	GP10E8ST34100 * *	GP104100-8	26.6 x 14.8 x 10.6	88
125/100	Open	176/150	194/225	GP10E8ST34125 * *	GP104125-8	29.1 x 14.8 x 10.6	106
150/125	Open	210/176	231/264	GP10E8ST34150 * *	GP104150-8	29.1 x 20.9 x 12.4	154
200/150	Open	253/210	278/315	GP10E8ST34200 * *	GP104200-8	29.1 x 20.9 x 12.4	154
200/150	Open	304/253	334/380	GP10E8ST34250 * *	GP104250-8	39.4 x 20.9 x 14.2	220
250/200	Open	377/304	415/456	GP10E8ST34300 * *	GP104300-8	39.4 x 20.9 x 14.2	220
300/250	Open	415/377	457/566	GP10E8ST34350 * *	GP104350-8	39.4 x 26.8 x 14.2	308
350/300	Open	485/415	534/623	GP10E8ST34400 * *	GP104400-8	39.4 x 26.8 x 14.2	308
400/350	Open	520/415	572/623	GP10E8ST34450 * *	GP104450-8	39.4 x 26.8 x 14.2	308
500/400	Open	650/520	715/780	GP10E8ST34500 * *	GP104500-8	55.1 x 26.8 x 17.7	551
600/450	Open	740/585	814/878	GP10E8ST34600 * *	GP104600-8	55.1 x 26.8 x 17.7	551
700/500	Open	840/650	924/975	GP10E8ST34700 * *	GP104700-8	55.1 x 35.6 x 17.7	793
800/600	Open	960/740	1056/1110	GP10E8ST34800 * *	GP104800-8	55.1 x 35.6 x 17.7	793

** Indicates factory use.

Note: Hp rating is shown for 230V and 460V nominal systems.

When applying at lower voltage, select the drive by rated current and not Hp rating.

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GP10 Drive Ratings Efficiency and Watts Loss

HP Rating	Rated Output Current (A)	Rated Output Power (KVA)	Efficiency at 2KHz (%)	Efficiency at 15KHz (%)	Watts Loss at 2KHz (W)	Watts Loss at 15KHz (W)	Internal DB (W)
230VAC							
0.25	1.5	0.59	92.0	90.5	25	30	N/A
0.5	3	1.1	93.5	91.7	35	45	N/A
1	5	1.9	94.9	94.0	50	60	N/A
2	8	3.1	95.7	94.1	80	110	N/A
3	11	4.3	95.9	94.9	110	140	N/A
5	17	6.7	96.2	95.4	170	210	N/A
7.5	22	8.7	96.2	95.2	210	280	N/A
10	29	11	96.5	95.3	290	370	N/A
15	42	16	96.4	95.2	410	550	N/A
20	55	21	96.9	95.9	500	670	N/A
25	67	26	96.8	95.8	630	840	N/A
30	78	31	96.5	95.5	770	1030	N/A
			2KHz (%)	10KHz (%)	2KHz (W)	10KHz (W)	
40	115	45	97.2	96.8	950	1100	N/A
50	145	57	97.0	96.7	1250	1400	N/A
60	180	71	97.1	96.6	1500	1750	N/A
75	215	85	97.3	96.6	1700	1950	N/A
100	283	112	97.4	97.0	2200	2500	N/A
			2KHz (%)	6KHz (%)	2KHz (W)	6KHz (W)	
125	346	137	97.4	97.2	2650	2800	N/A
150	415	165	97.4	97.3	3200	3350	N/A
460VAC							
0.5	1.5	1.1	93.5	89.3	35	60	N/A
1	2.5	1.9	95.4	91.7	45	85	N/A
2	3.7	2.9	96.7	94.1	60	110	N/A
3	5.5	4.3	97.0	94.5	80	150	N/A
5	9	7.1	97.1	95.0	130	230	N/A
7.5	12.5	9.9	97.3	95.3	160	290	N/A
10	16.5	13.1	97.3	95.4	210	370	N/A
15	23	18.3	97.6	95.9	300	520	N/A
20	30	23.9	97.9	96.5	360	610	N/A
25	37	29.4	97.8	96.4	460	770	N/A
30	44	35	97.8	96.4	530	870	N/A
			2KHz (%)	10KHz (%)	2KHz (W)	10KHz (W)	
40	60	47	97.8	96.9	750	1050	N/A
50	75	59	97.7	96.9	950	1300	N/A
60	91	72	97.8	97.0	1100	1550	N/A
75	112	89	97.8	97.0	1350	1900	N/A
100	150	119	97.8	97.1	1800	2450	N/A
			2KHz (%)	6KHz (%)	2KHz (W)	6KHz (W)	
125	176	140	98.1	97.8	1850	2200	N/A
150	210	167	98.0	97.8	2400	2750	N/A
200	253	202	98.0	97.7	2900	3350	N/A
250	304	242	98.1	97.8	3250	3800	N/A
300	377	300	98.1	97.8	4250	4900	N/A
350	415	330	98.2	97.9	4350	5100	N/A
400	485	386	98.1	97.8	5100	5900	N/A
450	520	414	98.1	97.8	5700	6650	N/A
500	650	518	98.2	97.9	6900	8050	N/A
600	740	590	98.1	97.8	8050	9350	N/A
700	840	669	98.2	97.9	8900	10400	N/A
800	960	765	98.1	97.8	10300	12100	N/A

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Installation Environment and Connection

1. Operating Environment

Install this product in a location that meets the conditions listed in Table below.

Table: Operating Environment

Item	Specifications
Location	Indoors
Ambient Temperature	-10° to +50°C (+14° to +122°F) - for products of 30 HP or less, the ventilating covers must be removed if ambient temperature exceeds +40°C (104°F), NEMA Type 4 & 12 Unit -10° to +40°C (+14° to +104°F)
Relative Humidity	5 to 95% (No condensation).
Atmosphere	The product must not be exposed to dust, direct sunlight, corrosive gas, oil mist, vapor, or water. There must be a minimum salt content in the atmosphere. Do not store where condensation may occur as a result of sudden changes in temperature.
Altitude	1000 m (3300 feet) or lower - For altitude above 1000 m (3300 feet), see Table 2-1-2.
Vibration	3mm peak from 2 to 9Hz, 9.8m/s2 from 9 to 20Hz, 2m/s2 from 20-55Hz, 1m/s2 from 55 to 200Hzs.

2. Installation Method

1. Securely fasten the product in an upright position on a solid structure with the logo facing the front. Do not turn the product upside down or install in a horizontal position. Fig. 2-2-1
2. Since heat is generated during drive operation, the spaces shown in Fig. 2-2-1 are required to ensure sufficient cooling. Do not install the product beneath a device sensitive to heat as heat radiates upward.
3. The heat sink may reach a temperature of 90°C (+194°F) during drive operation. Ensure that the material surrounding the product can withstand this temperature.

WARNING

Install this product on nonflammable material such as metal.

4. When installing this product in a control panel, consider ventilation to prevent the drive's ambient temperature from exceeding the specified value. Do not install the product in an area from which heat cannot be sufficiently released.
5. If two or more drives must be installed in the same device or control panel, arrange the units horizontally to minimize the effect of heat. If two or more drives must be installed vertically, place an insulated plate between the drives to minimize the effect of heat.
6. When shipped from the factory, drives provide internal cooling inside the panel. A drive of 30HP or less can be converted to external cooling simply by adding an optional mounting adapter.

CAUTION

Ensure that the drive and heat sink surfaces are kept free of foreign matter such as lint, paper dust, small chips of wood or metal, and dust. **Fire or accident may result.**

Table 2-1-2 Output current reduction rate based on altitude

Altitude	Output current reduction rate
3300 feet (1000m or lower)	1
3300-4950 feet (1000-1500m)	0.97
4950-6600 feet (1500-2000m)	0.95
6600-8250 feet (2000-2500m)	0.91
8250-9900 feet (2500-3000m)	0.88

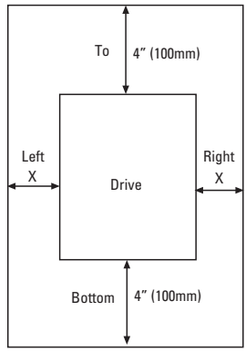


Fig. 2-2-1 30 HP or less: Gap X can be 0. (side-by-side installation) 40HP or more: Gap X >= 2.0" (50mm)

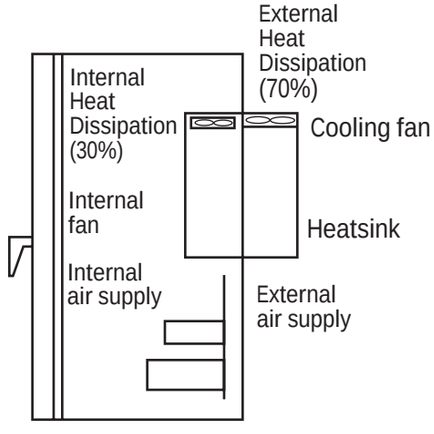


Fig. 2-2-2 Through Panel Mount

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A drive of 40HP or more can be converted to external cooling simply by moving the upper and lower mounting brackets as shown in Fig. 2-2-3. Remove the M6 bracket screws, move the brackets, then secure the brackets using the M5 case mounting screws. (The bracket screws are no longer required after changing the bracket mounting position.)

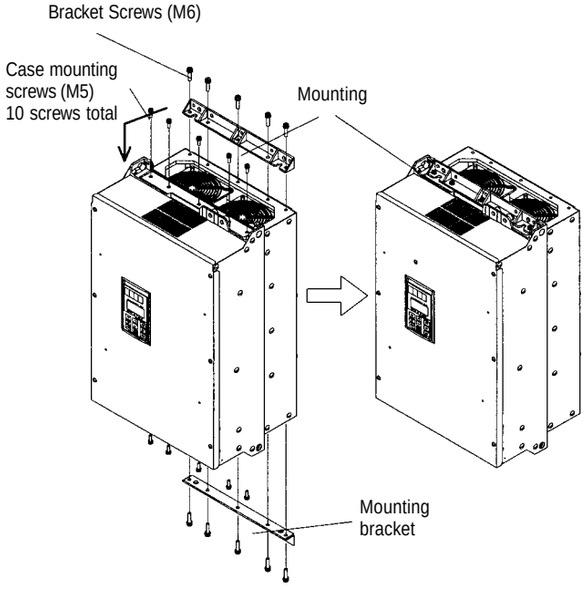


Fig. 2-2-3

In an external cooling system, a heat sink radiating about 70% of total drive heat (total loss) can be placed outside the device or control panel, as shown in Fig. 2-2-2.

7. For drives of 30HP or less, remove the ventilating covers if ambient temperature exceeds +40°C (104°F).

1. Removing the Ventilating Covers

One ventilating cover is mounted on top of the drive and two or three are mounted at the bottom. Remove the main cover and then remove ventilating covers by popping out the cover inserts as shown in Fig. 2-2-4.

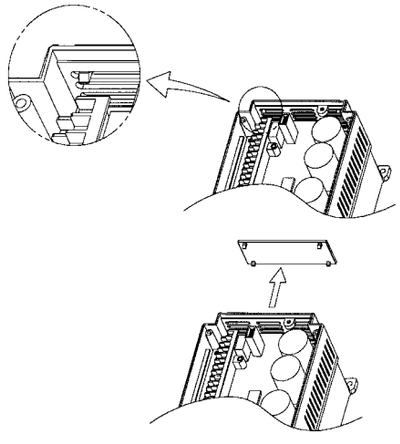


Fig. 2-2-4 Removing the ventilating cover

Installation of Open Type with NEMA 12 Heatsink Drive (40 Hp and above)

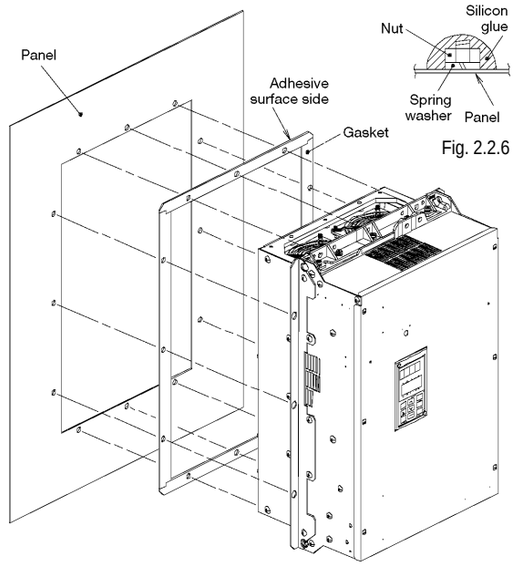


Fig. 2.2.6

Fig.2.2.5

1. Remove adhesive protection strip from gasket and then mount gasket to panel/enclosure, carefully aligning cutout and mounting holes.
2. Install the drive unit and tighten the mounting bolt and nut. (Tightening torque: 119 lbs-inch [M8], 425 lbs-inch [M12]). Mounting hardware to be supplied by customer. (refer to figure 2.2.5)
3. After proper torque has been applied to all mounting hardware, seal the outside end of the hardware with silicon glue. Silicon glue to be supplied by the customer. (Refer to Fig. 2.2.6)

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3. Connection

Remove the main cover before connecting the terminal blocks as follows.

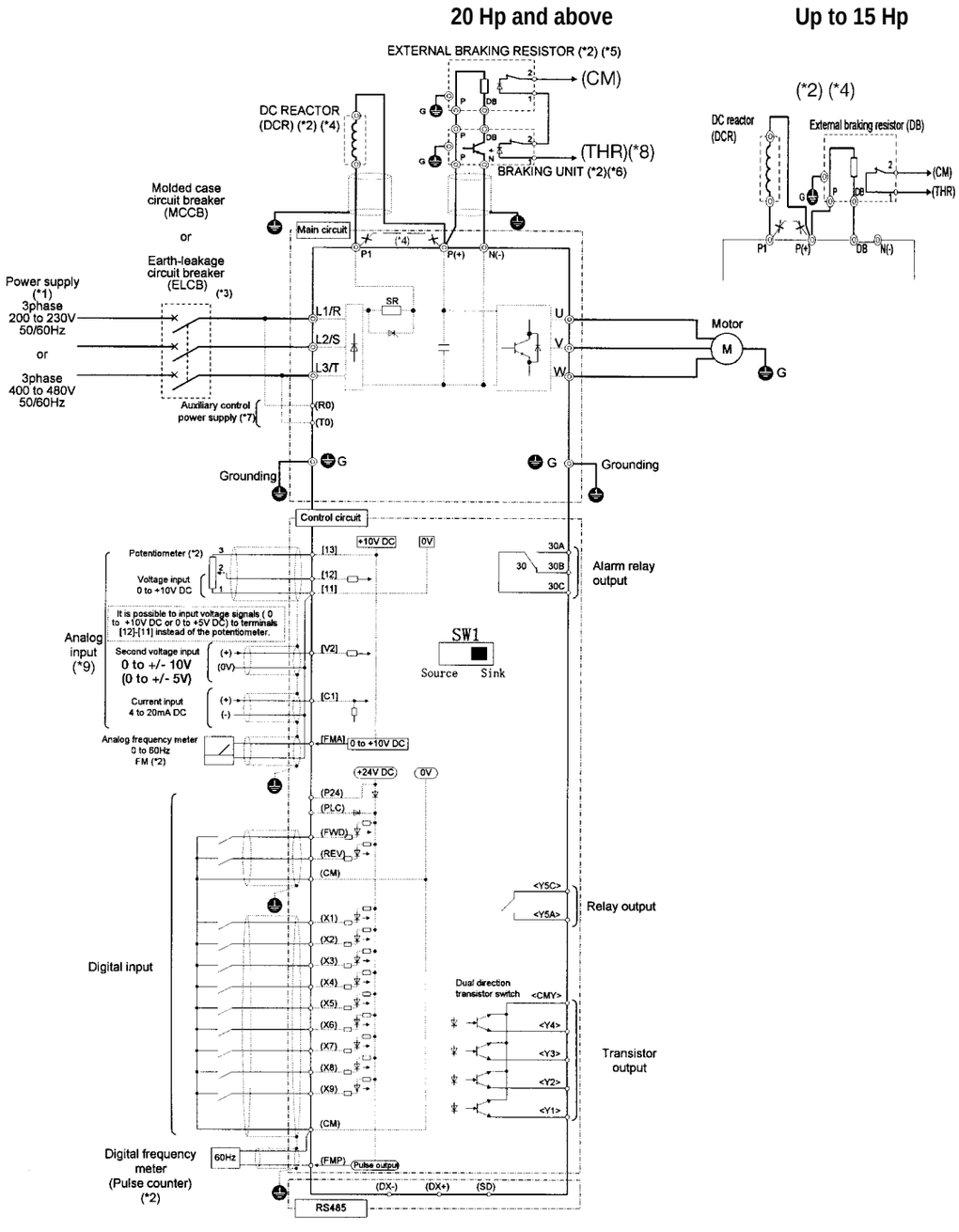
Basic Connection

1. Always connect power to the L1/R, L2/S, and L3/T main circuit power terminals on the drive. Connecting power to another terminal will damage the drive. Check that the input voltage is within the maximum allowable voltage marked on the nameplate, etc.
2. Always wire the ground terminal to ground to prevent problems such as fire or electric shock and to minimize noise.
3. Use a reliable crimp terminal for connection between a power terminal and a power wire.
4. After terminating the wiring connection, confirm the following:
   a. Confirm that the connection is correct.
   b. Confirm that all necessary connections have been made.
   c. Confirm that there is no short-circuit or ground fault between the terminals and wire.
5. Connection modification after power-on.
   The smoothing capacitor in the direct current portion of the main circuit cannot be discharged immediately after the power is turned off. To insure safety, use a multimeter to check that the direct current (DC) voltage is lowered to the safety range (25V DC or less) after the charge lamp goes off. Also, confirm that the voltage is zero before short-circuiting. The residual voltage (electric charge) may cause sparks.

> **WARNING**
>
> Always connect a ground wire. Electric shock or fire may result. Ensure that a trained specialist performs all wiring. Confirm that the power is turned off (open) before beginning any wiring operations. Electrical shock may result.

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Basic Connection Diagram (Sink Logic)

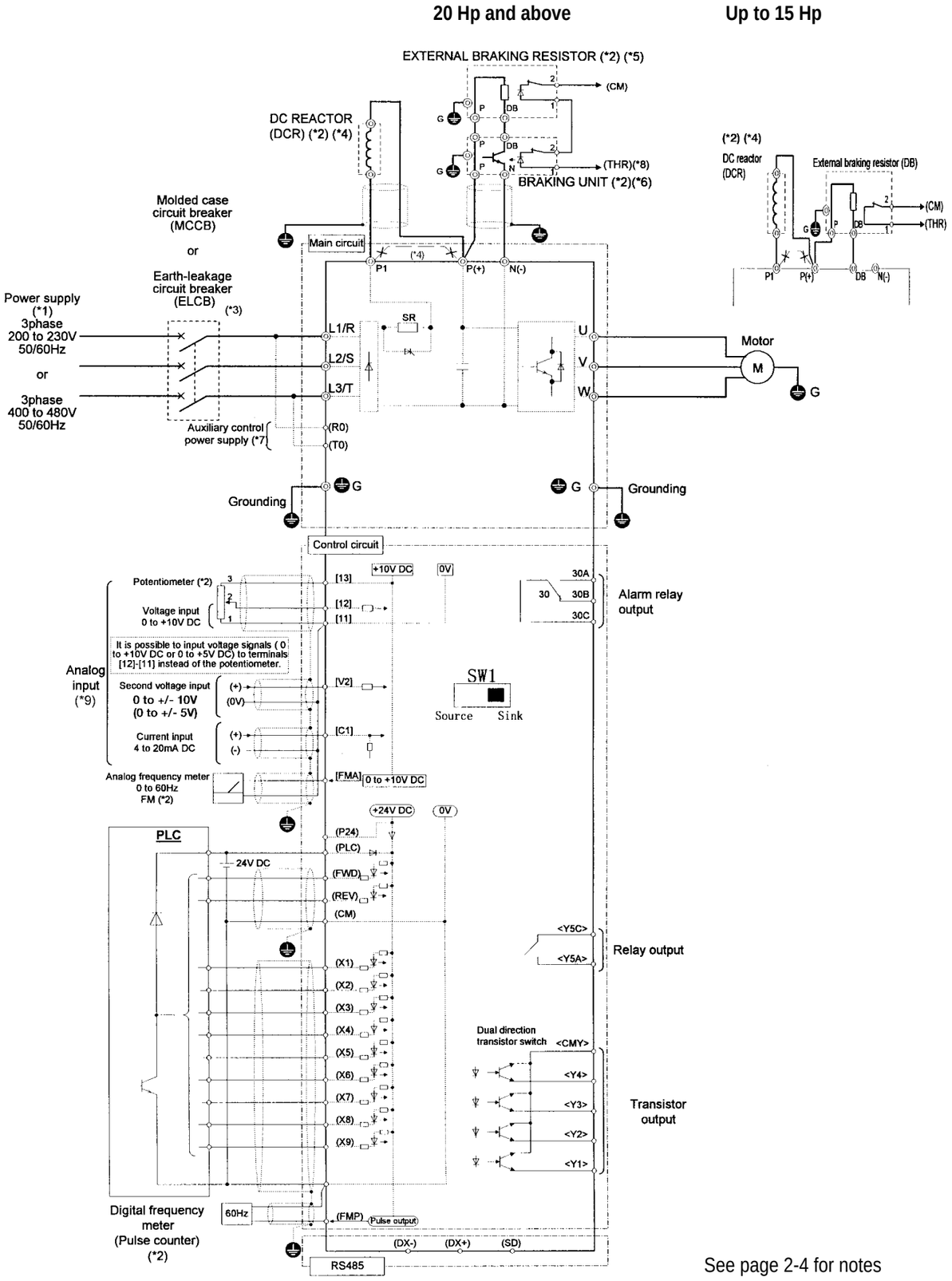


Note: The control circuit common terminals [11], (CM) and <CMY> are isolated

(*1) Use a drive with rated voltage matching the power supply voltage.
(*2) Use as required.
(*3) Use this peripheral device when necessary.
(*4) Remove the jumper wire between P1 and P(+) before connecting a DC REACTOR.
(*5) Be sure to use the braking unit (option) when connecting the external braking resistor (option)
(*6) Connect the braking unit to P(+) ans N(-). The auxiliary terminals [1] and [2] have polarity.
Connect them as shown in the figure above.
(*7) The drive can be operated without connecting the auxiliary control power supply.
(*8) Terminal (X1) to (X9) can be set to 9 (THR) - Braking unit thermal trip input.
(*9) If using V2 or C1, as a reference signal, they must be used exclusively.
(*10) It is possible to input voltage signals (0 to +10 VDC or 0 to +5 VDC) to terminals [12] [11] instead of the potentiometer.

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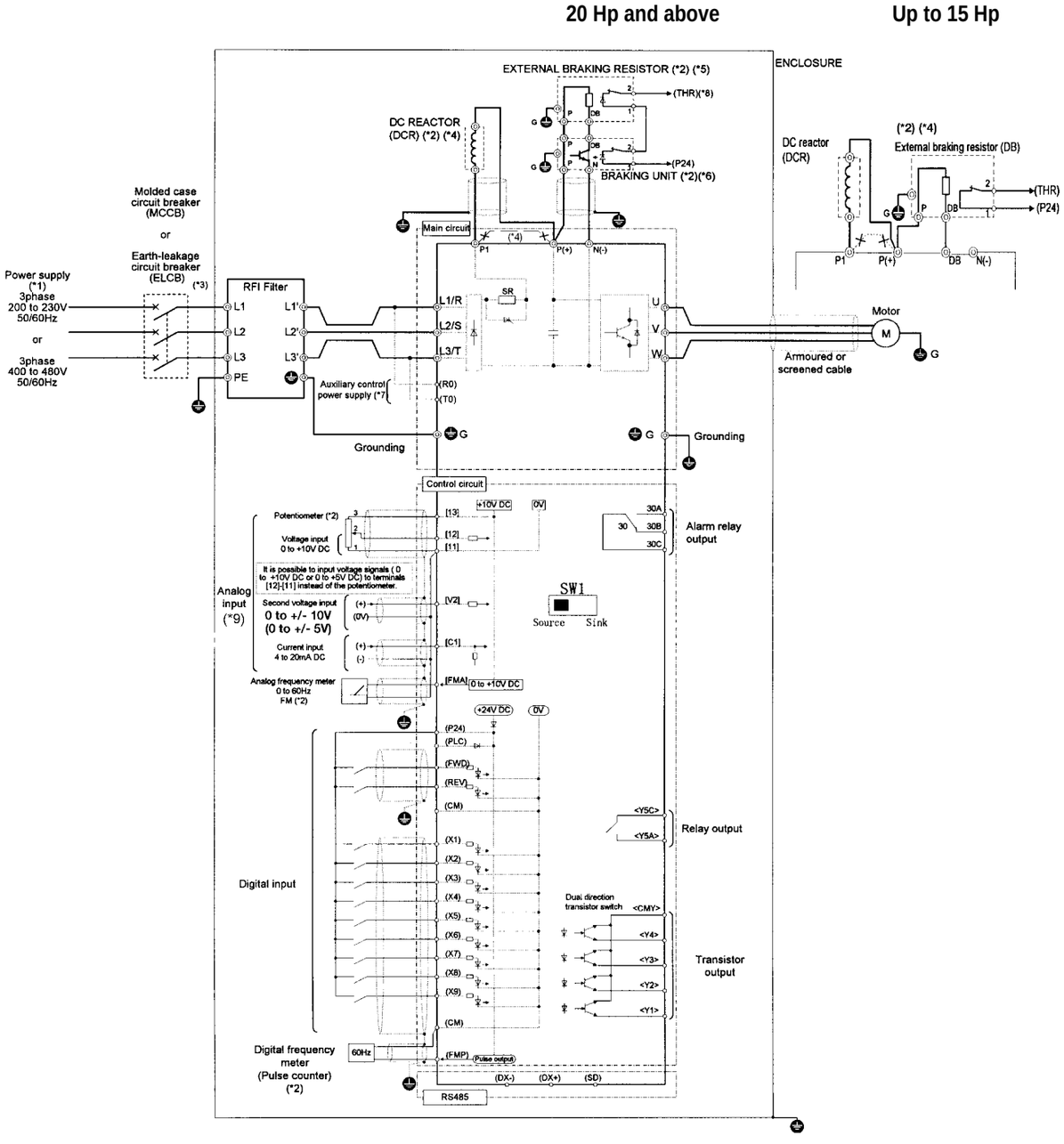
Basic Connection Diagram to PLC (Sink Logic)



See page 2-4 for notes

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Basic Connection Diagram (Source Logic, Typically used in Europe)



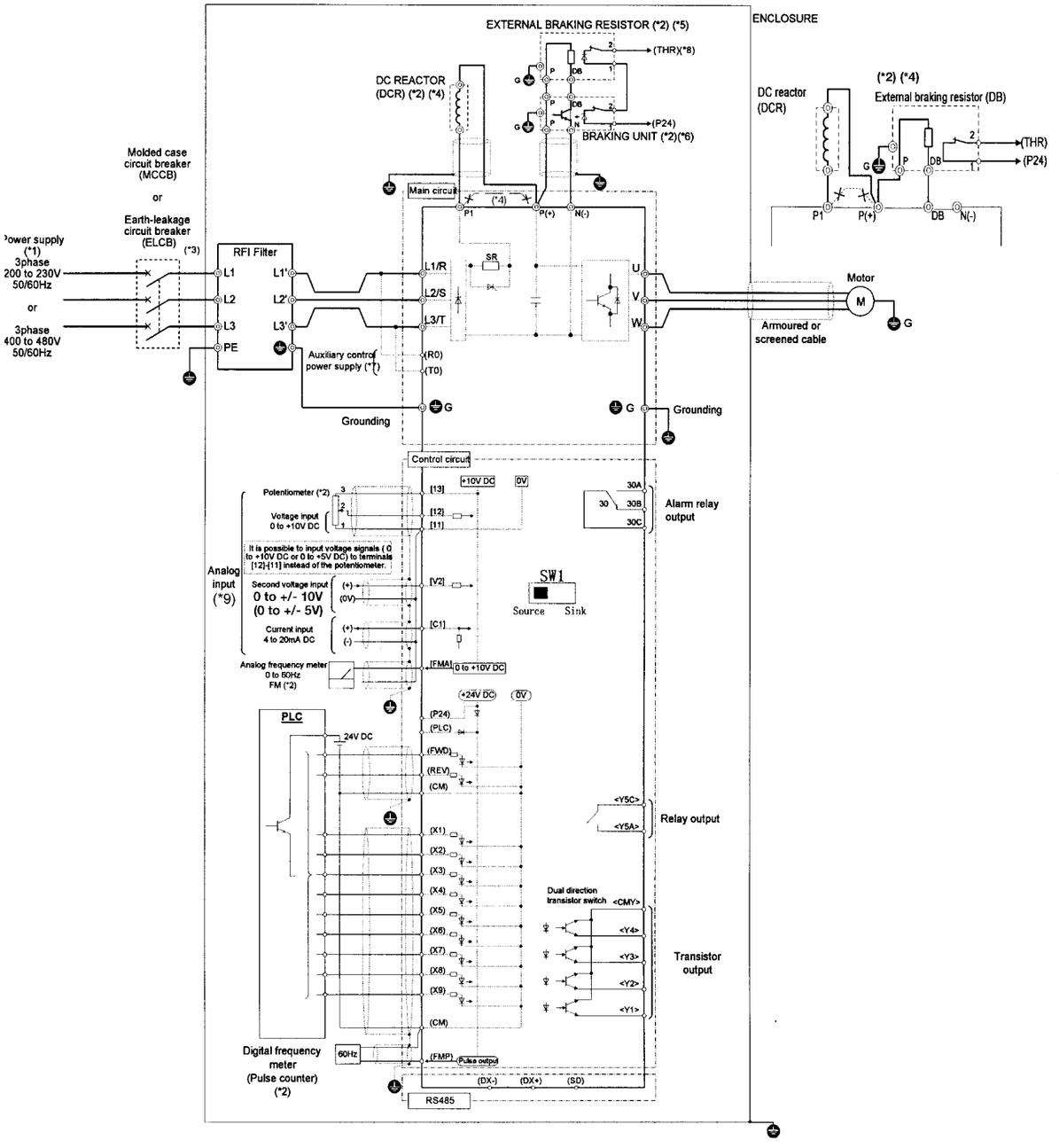
Note: The control circuit common terminals [11], (CM) and <CMY> are isolated

(*1) Use a drive with rated voltage matching the power supply voltage.
(*2) Use as required.
(*3) Use this peripheral device when necessary.
(*4) Remove the jumper wire between P1 and P(+) before connecting a DC REACTOR.
(*5) Be sure to use the braking unit (option) when connecting the external braking resistor (option).
(*6) Connect the braking unit to P(+) ans N(-). The auxiliary terminals [1] and [2] have polarity.
Connect them as shown in the figure above.
(*7) The drive can be operated without connecting the auxiliary control power supply.
(*8) Terminal (X1) to (X9) can be set to 9 (THR) - Braking unit thermal trip input.
(*9) If using V2 or C1, as a reference signal, they must be used exclusively.
(*10) It is possible to input voltage signals (0 to +10 VDC or 0 to +5 VDC) to terminals [12] [11] instead of the potentiometer .

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Basic Connection Diagram to PLC (Source logic, Typically used in Europe)

20 Hp and above **Up to 15 Hp**



See page 2-6 for notes

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Connecting the Main Circuit and Ground Terminals

Table: Functions of main circuit terminals and ground termnals

Symbol	Terminal Name	Description
L1/R,L2/S,L3/T	Main circuit power terminals	Connects a 3-phase power supply
U,V,W	Inverter output terminals	Connects a 3-phase motor
R0,T0	Input terminals for auxiliary control power	Connects a backup AC power supply to the control circuit (not supported for drives of 1 Hp or less)
P1,P(+)	DC reactor terminals	Connects the optional power correcting DC reactor
P(+),DB	Terminals for external braking resistor	Connects the optional external braking resistor (for drives of 15 Hp or less)
P(+),N(-)	Terminals for DC link circuit	Supplies DC link circuit voltage to the external braking unit (option) or power regeneration unit (option).
G	Ground terminal	Connects the drive chassis (case) to ground.

(1) Main circuit power terminals (L1/R, L2/S, L3/T)

1. Connect these terminals to the power supply via a molded-case circuit breaker or ground-leakage circuit breaker for circuit protection. Phase-sequence matching is unnecessary.
2. To insure safety, a magnetic contactor should be used to disconnect the drive from the power supply when the drive protective function activates.
3. Use control circuit terminal FWD/REV or the RUN/STOP key on the keypad panel to start or stop the drive. The main circuit power should be used to start or stop the drive only if absolutely necessary and then should not be used more than once every hour.
4. If you need to connect these terminals to a single-phase power supply, please contact the factory.

(2) Drive output terminals (U, V, W)

1. Connect these terminals to a 3-phase motor in the correct phase sequence. If the direction of motor rotation is incorrect, exchange any two of the U, V, and W phases.
2. Do not connect a power factor correction capacitor or surge absorber to the drive output.
3. If the cable from the drive to the motor is very long, a high-frequency current may be generated by stray capacitance between the cables and result in an overcurrent trip of the drive, an increase in leakage current, or a reduction in current indication precision.

When a motor is driven by a PWM-type drive, the motor terminals may be subject to surge voltage generated by drive element switching. If the motor cable (with 460V series motors, in particular) is particularly long, surge voltage will deteriorate motor insulation. To prevent this, use the following guidelines:

Drives 7.5 HP and larger			
Motor Insulation Level	1000V	1300V	1600V
460 VAC Input Voltage	66 ft (20 m)	328 ft (100 m)	1312 ft (400 m) *
230 VAC Input Voltage	1312 ft (400 m) *	1312 ft (400 m) *	1312 ft (400 m) *

Drives 5 HP and smaller			
Motor Insulation Level	1000V	1300V	1600V
460 VAC Input Voltage	66 ft (20 m)	165 ft (50 m) *	165 ft (50 m) *
230 VAC Input Voltage	328 ft (100 m) *	328 ft (100 m) *	328 ft (100 m) *
* For this case the cable length is determined by secondary effects and not voltage spiking.			

Note: When a motor protective thermal O/L relay is inserted between the drive and the motor, the thermal O/L relay may malfunction (particularly in the 460V series), even when the cable length is 165 feet (50m) or less. To correct, insert a filter or reduce the carrier frequency. (Use function code “F26 Motor sound”.)

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(3) Input terminals for auxiliary control power (R0 and T0)

The drive operates even if power is not provided to these terminals. If a protective circuit operates, and the magnetic contactor on the drive's power is opened (off), the inverter control circuit power, the alarm output (30A, B, and C), and the keypad panel display goes off. To prevent this, the main circuit AC power must also be supplied as auxiliary control power to the auxiliary control power input terminals (R0 and T0).

1. To ensure effective noise reduction when using a radio noise filter, the output power from the filter must go to the auxiliary control power input terminals. If these terminals are connected to the input side of the filter, the noise reduction effect deteriorates.

(4) DC reactor terminals (P1 and P(+))

1. Before connecting a power factor correcting DC reactor (optional) to these terminals, remove the factory-installed jumper.
2. If a DC reactor is not used, do not remove the jumper.

Note: For drives of 100 Hp or more, the DC reactor is provided as a separate standard component and should always be connected to the terminals. DC reactor is provided as open type, enclosure to be provided by other.

> **CAUTION**
>
> A DC reactor does not come with drives rated less than 100 Hp, however, use a DC reactor or AC reactor under the following conditions otherwise the drive may be damaged or malfunction.

1) Used when the capacity of the power supply transformer exceeds 500k VA and exceeds the rated capacity of the drive tenfold.
2. Used when a thyrister converter is connected as a common load on the same transformer.
3. Used to prevent a drive OV trip from occuring when the power factor capacitor in the power line is switched on and off.
4. Used when the voltage imbalance exceds 3%.

$$\text{Imbalance rate between phase [\%]} = \frac{\text{(Max. voltage [V] - Min. voltage [V]}}{\text{3-phase average voltage [V]}} \times 100\%$$

(5) Terminals for external braking resistor (P(+) and DB) (15 Hp or less)

The GP10 drive 15 Hp or less, does not contain a braking resistor. To improve braking performance, an external braking resistor must be installed.

1. Connect terminals P(+) and DB on the external braking resistor to terminals P(+) and DB on the drive.
2. The wiring length (twisted pair cables, etc.) should not exceed 16.5 feet (5m).

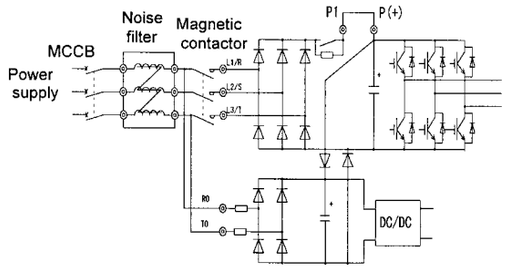


Fig. 2-3-2 Connection the auxiliary control-power input terminals

(6) Terminals for DC link circuit (P(+) and N(-))

The GP10 drive of 20 Hp or more, does not contain a drive circuit for the braking resistor. To improve braking performance, an external braking unit (option) and an external braking resistor (option) must be installed.

1. Connect terminals P(+) and N(-) on the braking unit to terminals P(+) and N(-) on the drive. The wiring length (twisted pair cables, etc.) should not exceed 16.5 feet (5m).
2. Connect terminals P(+) and DB on the braking resistor to terminals P(+) and DB on the braking unit. The wiring length (twisted pair cables, etc.) should not exceed 33 feet (10m). If terminals P(+) and N(-) on the drive are not used, leave the terminals open. If P(+) is connected to N(-), or the braking resistor is connected directly, the resistor will burn up.
3. Auxiliary contacts 1 and 2 of the braking unit have polarity.
4. Refer to DB unit instruction book for paralleled resistors.

Note: Braking units and resistors are rated on degree of braking, duration and system frequency of braking cycle. Verify units meet application requirements.

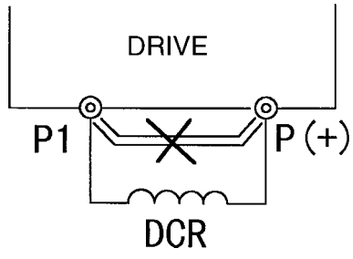


Fig. 2-3-3

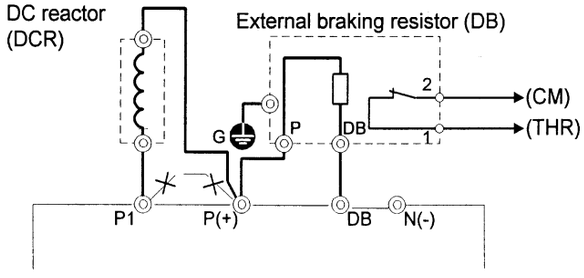


Fig. 2-3-4 Connection (15 Hp or less)

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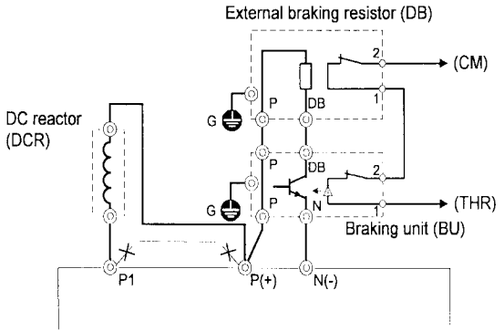


Fig. 2-3-5 Connection 20 Hp or more, 100 Hp or more parallel resistors, 200 Hp or more parallel braking units.

(7) Ground terminal

The grounding connector should be sized in accordance with the NEC or Canadian Electrical Code. The connection should be made by a UL listed or CSA certified closed-loop terminal connector sized for the wire gauge involved. The connector is to be fixed using the crimp tool specified by the connector manufacturer.

(8) Auxiliary power switching connector (CN UX) (for drives of 40 Hp or more)

When a drive of 40 Hp or more requires main circuit power voltage as listed in Table 2-3-3, disconnect the auxiliary power switching connector CN UX from U1 and connect to U2. For the switching method, see Fig. 2-3-7.

Table 2-3-3 Main Voltage Requiring Auxiliary Power Switching Connector

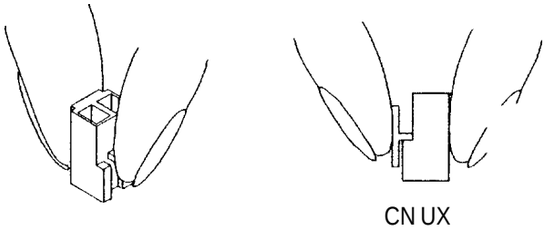
Frequency [Hz]	Power Voltage Range [VAC]
50	380 - 398
60	380 - 430

CAUTION

- Check that the number of phases and rated voltage match those of the AC power supply.
- Do not connect the AC power supply to the output terminals (U, V, W). Injury may result.
- Do not directly connect a braking resistor to the DC terminals (P[+] and N[-]). Fire may result.

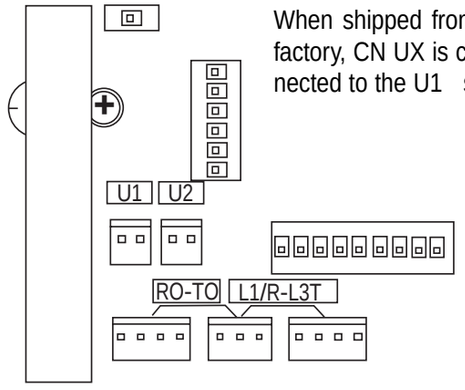
The switching connectors are mounted on the power PCB above the control PCB as shown on the right.

Note: To remove a connector, unlock the connector (using the locking mechanism) and pull. To install, firmly push the connector until it clicks into place.



CN UX

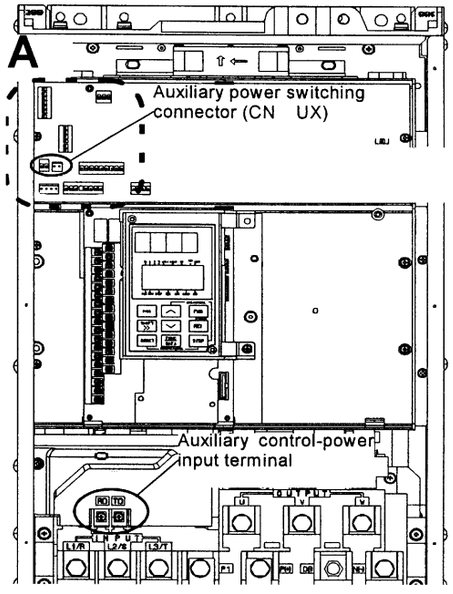
<Enlarged view of part A>

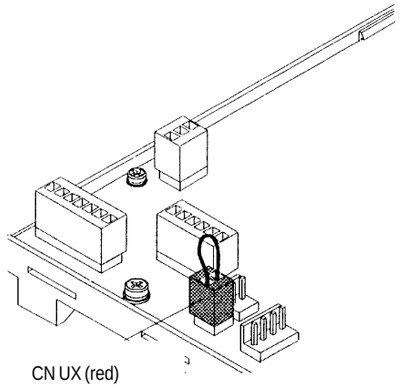


When shipped from the factory, CN UX is connected to the U1 side.

<3D view of part A>

Factory Shipment Status Connector CN UX: U1



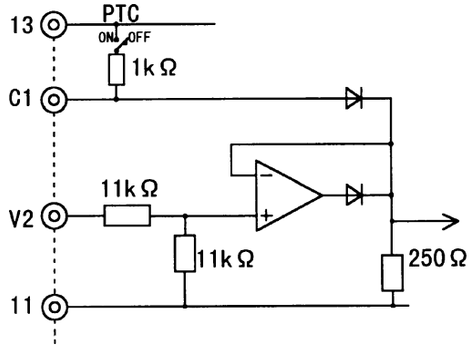


CN UX (red)

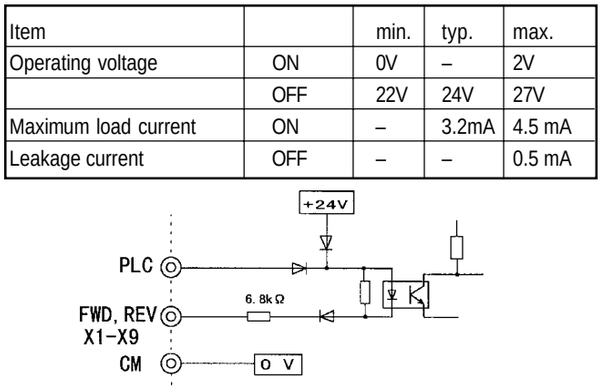
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Connecting the Control Terminals

The table below lists the functions of the control circuit terminals. A control circuit terminal should be connected according to its function setting.

Classification	Terminal Symbol	Terminal Name	Function
Analog input	13	Potentiometer power supply	Used for +10V DC power supply for frequency setting POT (resistance of 1 to 5k Ohms)
	12	Voltage input	1. Frequency is set according to the analog input voltage supplied from an external circuit. - 0 to +10V DC / 0 to 100% - Reversible operation using positive and negative signals: 0 to +/- 10V DC / 0 to 100% - Reverse operation: +10 to 0V DC / 0 to 100% 2. Input feedback signal for PID control is input. 3. The analog input value from the external circuit is used for torque control * Input resistance: 22 k Ohms
	V2	Voltage input supplied from an external circuit.	¨ Frequency is set according to the analog input voltage - 0 to +10V DC/0 to 100% - Reverse operation: +10 to 0V DC/0 to 100% * Use only one terminal - V2 or C1 Exclusively * Input resistance: 22 k Ohms
	C1	Current input	1. Frequency is set according to the analog input current supplied from an external circuit. - 4 to 20mA DC / 0 to 100% - Reverse operation: 20 to 4mA DC / 0 to 100% 2. The feedback signal for PID control is input. 3. PTC thermistor input  * Use only one terminal - V2 or C1 Exclusively * Input resistance: 250 Ohms * PTC switch is off when PTC function is not used
	11	Analog input common	Common terminal for analog input signals

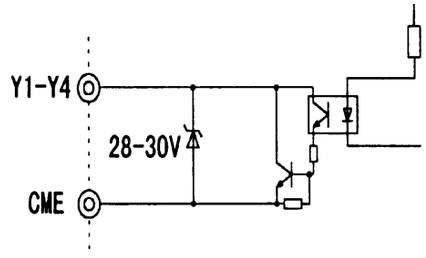
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<table>
<tr><td rowspan="15">Digital input</td><td>FWD</td><td>Forward operation / Stop command</td><td>Used for forward operation (when FWD-CM is on) or deceleration and stop (when FWD-CM is opened)</td></tr>
<tr><td>REV</td><td>Reverse operation / Stop command</td><td>Used for reverse operation (when REV-CM is on) or deceleration and stop (when REV-CM is opened)</td></tr>
<tr><td>X1</td><td>Digital input 1</td><td rowspan="10">The coast-to-stop command, external alarm, alarm reset, multi-step frequency selection, and other functions (from an external circuit) can be assigned to terminals X1 to X9. For details, see "Setting the Terminal Functions E01 to E09" in Section 5.2 Function Explanation.
<Specifications of digital input circuit>

</td></tr>
<tr><td>X2</td><td>Digital input 2</td></tr>
<tr><td>X3</td><td>Digital input 3</td></tr>
<tr><td>X4</td><td>Digital input 4</td></tr>
<tr><td>X5</td><td>Digital input 5</td></tr>
<tr><td>X6</td><td>Digital input 6</td></tr>
<tr><td>X7</td><td>Digital input 7</td></tr>
<tr><td>X8</td><td>Digital input 8</td></tr>
<tr><td>X9</td><td>Digital input 9</td></tr>
<tr><td></td><td></td></tr>
<tr><td>P24</td><td>Control Unit power Supply</td><td>+24VDC power supply for control input. Maximum output current 100mA</td></tr>
<tr><td>PLC</td><td>PLC signal power</td><td>Used to connect PLC power supply for output signals; rated nominal voltage = 24 VDC (22 to 27 V DC range) at sink logic operation.</td></tr>
<tr><td>CM</td><td>Digital input common</td><td>Common terminal for digital input signals and P24</td></tr>
<tr><td>Analog output</td><td>FMA

(11: common terminal)</td><td>Analog monitor</td><td>Outputs monitor signal using analog DC voltage 0 to +10V DC.
The signal indicates one of the following:
- Output frequency (before slip compensation)
- Load factor
- Output frequency (after slip compensation)
- Power consumption
- Output current
- PID feedback value
- Output voltage
- PG feedback value
- Output torque
- DC link circuit voltage
* Connectable impedance: min. 5k ohms</td></tr>
<tr><td>Pulse output</td><td>FMP
(CM: common terminal)</td><td>Frequency monitor
(pulse waveform output)</td><td>Outputs a monitor signal using the pulse waveform.
This signal has the same function as the FMA signal.</td></tr>
</table>

Item		min.	typ.	max.
Operating voltage	ON	0V	–	2V
	OFF	22V	24V	27V
Maximum load current	ON	–	3.2mA	4.5 mA
Leakage current	OFF	–	–	0.5 mA

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<table>
<tr><td>Transistor</td><td>Y1</td><td>Transistor output 1</td><td>A running signal, frequency equivalence signal, overload early warning output signal, and other signals from the drive are output (as transistor output) to arbitrary ports. For details, see "Setting the Terminal Functions E20 to E23" in Section 5.2 Function Explanation.
* <Specifications of transistor output circuit>
<table><tr><td>Item</td><td></td><td>min.</td><td>typ.</td><td>max.</td></tr><tr><td>Operating voltage</td><td>ON</td><td>–</td><td>1V</td><td>2V</td></tr><tr><td></td><td>OFF</td><td>–</td><td>24V</td><td>27V</td></tr><tr><td>Maximum load current</td><td>ON</td><td>–</td><td>–</td><td>50 mA</td></tr><tr><td>Leakage current</td><td>OFF</td><td>–</td><td>–</td><td>0.1 mA</td></tr></table></td></tr>
<tr><td></td><td>Y2</td><td>Transistor output 2</td><td></td></tr>
<tr><td></td><td>Y3</td><td>Transistor output 3</td><td></td></tr>
<tr><td></td><td>Y4</td><td>Transistor output 4</td><td></td></tr>
<tr><td></td><td>CME</td><td>Transistor output common</td><td>Common terminal for transistor output signals. This terminal is insulated from terminals (CM) and [11].</td></tr>
<tr><td>Relay output</td><td>30A,30B,30C</td><td>Alarm outputs for any fault.</td><td>If the drive is stopped by an alarm (protective function), the alarm signal is output from the relay contact output terminal (1SPDT). Contact rating: 250 VAC, 0.3A,cosØ = 0.3, 48 VDC, 0.5A for CE Marking
An excitation mode (excitation at alarm occurrence or at normal operation) can be selected.</td></tr>
<tr><td></td><td>Y5A,Y5C</td><td>Multi-purpose signal</td><td>These signals can be output similar to the Y1 to Y4 signals above. The contact rating is the same as that of the alarm output above.</td></tr>
<tr><td>Communic-ation</td><td>DX+,DX–</td><td>RTU communication</td><td>Input / output signal terminals for RTU communication input / output Up to 31 inverters can be connected using the daisy chain method.</td></tr>
<tr><td></td><td>SD</td><td>Communication cable shield connection terminal</td><td>Terminal for connecting the cable shield. The terminal is electrically floating.-</td></tr>
</table>

(1) Analog input terminals (13, 12, C1, and 11)

1. These terminals receive low level analog signals that may be affected by external noise. The cables must be as short as possible (20 meters or less), must be shielded, and the shields must be grounded. If the cables are affected by external induction noise, the shielding effect may be improved by connecting the shield to terminal [11].

2. If contacts must be connected to these circuits, twin (bifurcated) contacts for handling low level signals must be used. A contact must not be connected to terminal [11].

3. If an external analog signal output device is connected to these terminals, it may malfunction as a result of drive noise. To prevent malfunction, connect a ferrite core or capacitor to the external analog signal output device.

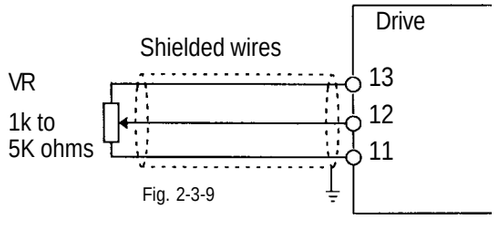


Fig. 2-3-9

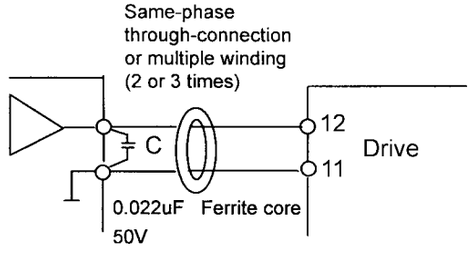


Fig. 2-3-10 Example of Noise Prevention

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(2) Digital input terminals (FWD, REV, X1 to X9, PLC, and CM)

1. Digital input terminals (e.g., FWD, REV, X1 to X9) are generally turned on or off by connecting or disconnecting the line to or from the CM terminal.

   If digital input terminals are turned on or off by switching the PLC's open collector output using an external power supply, a resulting bypass circuit may cause the drive to malfunction. To prevent a malfunction, connect the PLC terminal as shown in Fig. 2-3-11.

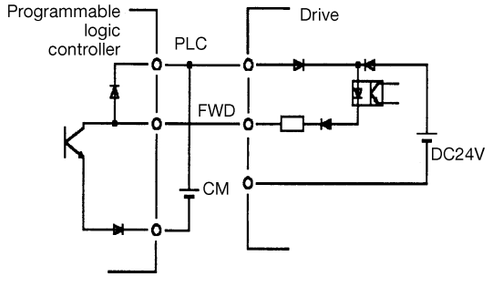


Fig. 2-3-11 Prevention of Bypass Current by External Power

2. When using a contact input, a high-quality relay with reliable contacts must be used.

(3) Transistor output terminals (Y1 to Y4, CME)

1. These terminals have a circuit configuration as shown in Table 2-3-3, "Transistor Output". Confirm the polarity of the external power supply.
2. To connect a control relay, connect a surge absorbing diode to both ends of its exciting coil.

(4) Sink or Source Logic Selection.

1. Set SWI for Sink or Source Connection to the PLC. The factory default setting is Sink and this instruction manual explains Sink logic function only.
2. When you need to connect source type logic, refer to Basic Connection Diagram Fig. 2-3-3 and Fig. 2-3-4 and Technical Information Manual. (Sink Logic is commonly used in the USA and Source Logic is commonly used in Europe.)

(5) Others

1. To prevent a malfunction as a result of noise, control terminal cables must be placed as far as possible from the main circuit cables.
2. The control cables inside the inverter must be secured to prevent direct contact with the main circuit (e.g., main circuit terminal block).

WARNING

Control lines generally do not have enhanced insulation. If the insulation of a control line is damaged, the control signals may be exposed to high voltage in the main circuit. The Low Voltage Directive in Europe also restricts the exposure to high voltage. Electric shock may result

CAUTION

The inverter, motor, and cables generate noise. Check that the ambient sensors and devices do not malfunction. Accident may result.

(6) Wiring of control circuit (inverter of 40 Hp or more)

1. Pull out the control circuit wiring along the left panel as shown in Fig. 2-3-12.
2. Secure the cable to cable binding hole A (on the left wall of the main circuit terminal block) using a cable-tie
   (e.g., Insulock). The cable-tie must not exceed 0.14" (3.5mm) in width and 0.06" (1.5mm) in thickness.
3. When the optional PC board is mounted, the signal lines must be secured to cable binding hole B.

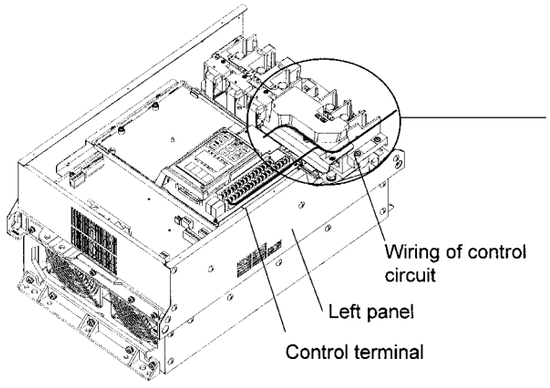


Fig. 2-3-12 The Control Wiring Route

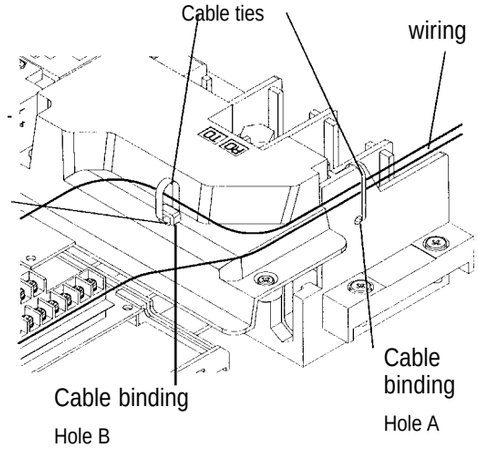


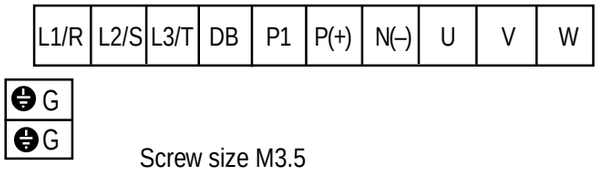
Fig. 2-3-13 Securing Positions for Inverter Control Circuit Wiring (40 HP or more)

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Terminal Configuration

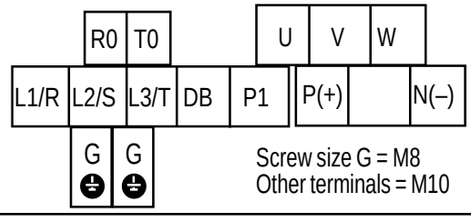
1. Main circuit terminals

1/4 to 1 Hp 230 VAC
1/2 to 1 Hp 460 VAC



Screw size M3.5

60 To 100 Hp 230 VAC
125 to 200 Hp 460 VAC

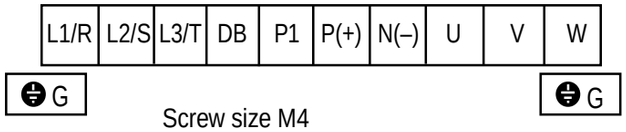


Screw size G = M8
Other terminals = M10

2 to 5 Hp 230 VAC
2 to 5 Hp 460 VAC

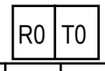


Screw size M3.5

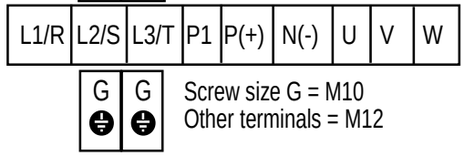


Screw size M4

125 Hp 230 VAC

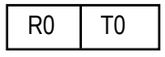


Screw size M4

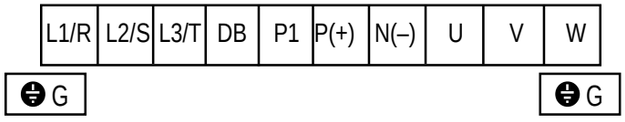


Screw size G = M10
Other terminals = M12

7.5 to 15 Hp 230 VAC
7.5 to 15 Hp 460 VAC

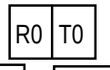


Screw size M3.5

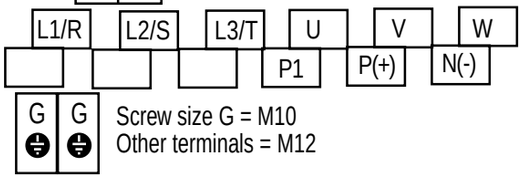


Screw size M5

150 Hp 230 VAC
250 to 450 Hp 460 VAC

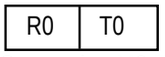


Screw size M4

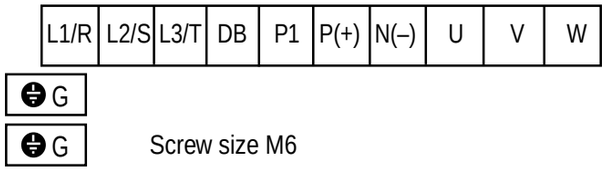


Screw size G = M10
Other terminals = M12

20 to 30 Hp 230 VAC
20 to 30 Hp 460 VAC

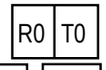


Screw size M3.5

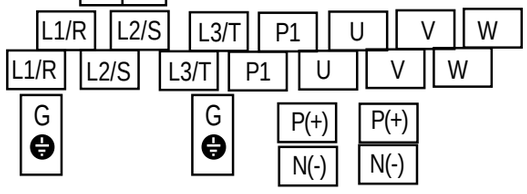


Screw size M6

500, 600 Hp 460 VAC

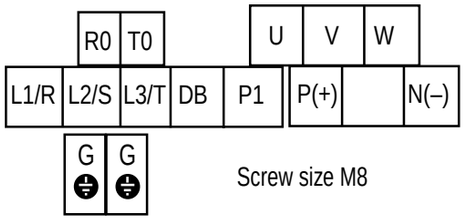


Screw size M4



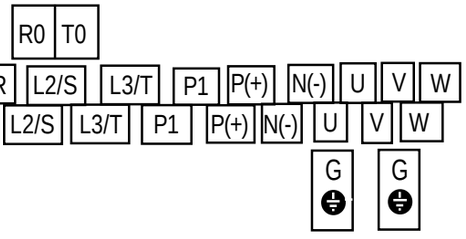
Screw size G = M10
Other terminals = M12

40 to 50 Hp 230 VAC
40 to 100 Hp 460 VAC
Screw size M4



Screw size M8

700, 800 Hp 460 VAC



Screw size RO,TO = M4 G = M10
Other terminals = M12

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2. Control circuit terminals

	30A	Y5A	CMY	Y3	Y1	C1	FMA	FMP	PLC	X1	X2	X3	X4	X5	X6	X7	X8	X9
30C	30B	Y5C	Y4	Y2	11	12	13	V2	CM	CM	FWD	REV	P24	P24	DX-	DX+	SD	

GP10 Drive Cable Size, Tightening Torque and Circuit Protection Rating

2-3-5 GP10-Variable Torque, Constant Torque Drive Cable Size, Tightening Torque and Circuit Protection Rating

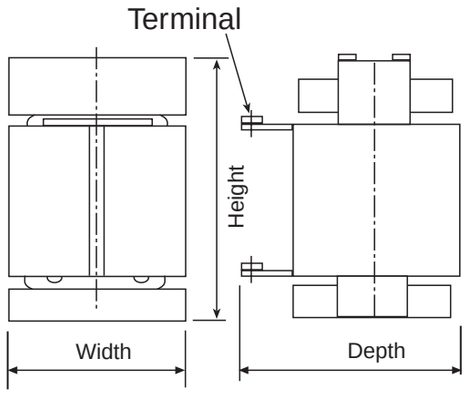
	Incoming Device				Tightening Torque lb-Inch (Nm)					Cable size AWG				
	Input Fuse													
HP	L1/R, L2/S, L3/T (Nominal)	L1/R, L2/S, L3/T (Maximum) (*1)	Auxiliary Input R0, T0	Input Circuit Breaker (*1)	L1/R, L2/S, L3/T, U, V, W, P1, P(+)	E(G)	DB circuit (*2) P(+), N(-), DB	R0, T0	Control	L1/R, L2/S, L3/T	U, V, W	DC Reactor P1, P(+)	DB circuit (*2) P(+), N(-), DB	R0, T0
230VAC Input														
0.25/0.25	3	3	3	15	10.6 (1.2)		10.6 (1.2)	- - -	6.2 (0.7)	16			16	- - -
0.5/0.5	5	6	3	15										
1/1	10	15	3	20										
2/2	15	20	3	30	20.8 (2.36)		20.8 (2.36)	10.6 (1.2)		14			14	14
3/3	20	30	3	40										
5/5	35	50	3	60						10				
7.5/5	60	80	3	100	31.0 (3.5)		31.0 (3.5)			8				
10/9.5	70	125	3	125						6				
15/10	100	150	3	175	51.3 (5.8)					4				
20/15	125	200	3	225						3				
25/20	150	225	3	250						2				
30/25	175	250	3	300						1				
40/30	200	-	5	200	119(13.5)					4/0	1/0	2/0		10
50/40	225	-	5	225										
60/50	300	-	5	300	239(27)	119(13.5)	119 (13.5)			Qty2 - 1	3/0	4/0	10	
75/60	350	-	5	350						Qty2 - 2/0	4/0	Qty2 - 1		
100/75	300	-	5	300						Qty2 - 3/0	Qty2 - 1/0	Qty2 - 2/0	8	
125/100	400	-	5	400	425(48)	239(27)				Qty 2 - 2/0	Qty2 - 3/0	Qty2 - 4/0	6	
150/125	450	-	5	450						Qty2 - 4/0	Qty2 - 4/0	Qty2 - 250	4	
460VAC Input														
0.5/0.5	3	3	3	15	10.6 (1.2)		10.6 (1.2)	- -	6.2 (0.7)	16			16	- -
1/1	5	6	3	15										
2/2	10	10	3	15	20.8 (2.36)		20.8 (2.36)	10.6 (1.2)		14			14	14
3/3	15	15	3	20										
5/5	20	25	3	35						14				
7.5/5	30	45	3	50	31.0 (3.5)		31.0 (3.5)			12				
10/7.5	40	60	3	70						10				
15/10	50	90	3	90	51.3 (5.8)									
20/15	70	110	3	110						8				
25/20	80	125	3	150						6				
30/25	100	125	3	175						4				
40/30	100	-	10	100	119(13.5)					2	3	3		10
50/40	125	-	10	125						1	2	2		
60/50	175	-	10	175			51.3 (5.8)			2/0	2	1		
75/60	150	-	10	150						3/0	1/0	2/0		
100/75	175	-	10	175	239(27)	119(13.5)				2/0	3/0	4/0		
125/100	200	-	10	200		239(27)				3/0	4/0	Qty2 - 1	10	
150/125	225	-	10	225			119 (13.5)			Qty2 - 1/0	Qty2 - 1/0	Qty2 - 1/0	8	
200/150	300	-	10	300						Qty2 - 1/0	Qty2 - 2/0	Qty2 - 3/0		
250/200	400	-	10	400	425(48)		239 (27)			Qty2 - 3/0	Qty2 - 3/0	Qty2 - 4/0	6	
300/250	450	-	10	450						Qty2 - 4/0	Qty2 - 250	Qty2 - 300	4	
350/300	500	-	10	500						Qty2 - 250	Qty2 - 300	Qty2 - 350		
400/350	600	-	10	600			(*3)			Qty2 - 350	Qty2 - 400	Qty2 - 500	(*3)	
450/350	700	-	10	700						Qty2 - 500	Qty2 - 500	Qty2 - 700		
500/400	700	-	10	700						Qty2 - 350	Qty2 - 400	Qty2 - 500		
600/450	1000	-	10	1000						Qty2 - 500	Qty2 - 500	Qty2 - 70		
700/500	1000	-	10	1000						Qty2 - 600	Qty2 - 600	Qty2 - 80		
800/600	1200	-	10	1200						Qty2 - 700	Qty2 - 750	Qty2 - 1000		

(*1)Class J Fuse or Circuit Breaker reted 600V with the maximum current rating as shown in the above table shall be connected to the drive for 30HP and less.
(*2)Based on GE Fuji standard DB unit and DB resistor designs. Other rating require careful review.
(*3) Consult factory
Device ratings such as system coordination, short-circuit rating and type must be carefully reviewed by the user.
Wire size from NEC tables 310-16. Copper wire rated 60 Deg. C for 100amps or less, 75 Deg. C for over 100 amps in 30 Deg. C ambient and 1.25 times Drive rated amps.

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DC Link Reactor

Dimensions in inches



Hp	Model No.	Width	Depth	Height	Weight	Loss [W]
230V GP10-Variable Torque/Constant Torque						
100/75	DCR2-75B	7.87	10.63	7.09	37	55
125/100	DCR2-90B	7.09	11.02	8.46	37	57
150/125	DCR2-110B	7.48	12.99	9.05	46	67
460V GP10-Variable Torque/Constant Torque						
100/75	DCR4-75B	7.48	10.63	6.89	35	58
125/100	DCR4-90B	7.48	11.02	7.87	44	64
150/125	DCR4-110B	7.48	11.02	7.87	46	73
200/150	DCR4-132B	7.87	11.02	8.07	55	84
250/200	DCR4-160B	8.27	12.6	8.07	68	90
300/250	DCR4-200B	8.27	12.99	9.06	75	126
350/300	DCR4-220B	8.66	13.78	9.06	81	131
400/350	DCR4-280B	8.66	14.57	9.65	95	133
450/350	DCR4-280B	8.66	14.57	9.65	95	150
500/400	DCR4-355B	9.84	12.99	8.78	99	205
600/450	DCR4-400B	9.84	13.78	9.17	106	215
700/500	DCR4-450B	10.63	13.78	10.35	121	272
800/600	DCR4-500B	11.1	14.17	10.35	143	292

Note:

- GP10 Drives rated 100 Hp and above are furnished with a DC link reactor. This reactor must be installed between terminal P1 and P+ prior to commissioning of the Drive.
- The weight of the DC Link Reactor is not included with that of the Drive.
- DC Link Reactor is provided as open type and is separately mounted. Enclosure to be provided by others.

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Function Selection

Function Selection List

F: Fundamental Functions

Pg.	Func. No.	Name	LCD Display		Setting Range	Unit	Min.	Factory Setting		Data Formst	Change during op
								30 HP	40 HP		
	F00	Data protection	F00	DATA PRTC	0, 1	-	-	0		1	N
5-7	F01	Frequency command 1	F01	FREQ CMD 1	0 to 11	-	-	0		1	N
	F02	Operation method	F02	OPR METHOD	0 to 4	-	-	0		1	N
	F03	Maximum frequency 1	F03	MAX Hz-1	50 to 120Hz	Hz	1	60		1	N
	F04	Base frequency 1	F04	BASE Hz-1	25 to 120Hz	Hz	1	60		1	N
5-10	F05	Rated voltage 1 (at Base frequency 1)	F05	RATED V-1	0V: (Output voltage proportional to source voltage) 230V class: 80 to 240V 460V class: 320 to 480V	V	1	230: (230V class) 460: (460V class)		1	N
	F06	Maximum voltage 1 (at Maximum frequency 1)	F06	MAX V-1	230V class: 80 to 240V 460V class: 320 to 480V	V	1	230: (230V class) 460: (460V class)		1	N
	F07	Acceleration time 1	F07	ACC TIME1	0.01 to 3600 s	s	0.01	6.0	20.0	12	Y
	F08	Deceleration time 1	F08	DEC TIME1							
	F09	Torque boost 1	F09	TRQ BOOST1	0.0, 0.1 to 20.0	-	0.1	2.0		12	Y
	F10	Electronic (Select)	F10	ELCTRN OL1	0, 1, 2	-	-	1		3	Y
	F11	Thermal 1 (level)	F11	OL LEVEL1	20 to 135% of drive rated current	A	0.01	Motor rated current		1	Y
5-11	F12	(time constant)	F12	TIME CNST1	0.5 to 75.0 min	min	0.1	5.0	10.0	19	Y
	F13	Electronic thermal overload relay (for braking resistor)	F13	DBR OL	[Up to 15 HP] 0, 1, 2	-	-	1		3	Y
					[20 HP and above] 0			0			
5-12	F14	Restart mode after momentary power failure	F14	RESTART	0 to 5	-	-	0		1	N
	F15	Frequency (high)	F15	H LIMITER	0 to 120 Hz	Hz	1	70		1	Y
	F16	Limiter (low)	F16	L LIMITER				0		1	N
	F17	Gain (for frequency set signal)	F17	FREQ GAIN	0.0 to 200.0%	%	0.1	100.0		1	Y
5-14	F18	Bias frequency	F18	FREQ BIAS	-120.0 to +120.0 Hz	Hz	0.1	0.0		1	Y
	F20	DC brake (starting frequency)	F20	DC BRK Hz	0.0 to 60.0 Hz	Hz	0.1	0.0		3	
	F21	(braking level)	F21	DC BRK LVL	0 to 80%	%	1	0		1	Y
	F22	(braking time)	F22	DC BRK t	0.0s (inactive)	s	0.1	0.0		3	
	F23	Starting frequency	F23	START Hz	0.1 to 60.0 Hz	Hz	0.1	0.5		3	
	F24	(holding time)	F24	HOLDING t	0.0 to 10.0 s	s	0.1	0.0		3	N
	F25	Stop frequency	F25	STOP Hz	0.1 to 6.0 Hz	Hz	0.1	0.2		1	
5-15	F26	Motor sound (carrier freq.)	F26	MTR SOUND	0.75 to 15 kHz (6kHz)	kHz	1	2		1	Y
	F27	(sound tone)	F27	SOUND TONE	0 to 3	-	-	0		1	Y
	F30	FMA (voltage adjust)	F30	FMA V-ADJ	0 to 200%	%	1	100		1	Y
	F31	(function)	F31	FMA FUNC	0 to 10	-	-	0		1	Y
	F33	FMP (pulse rate)	F33	FMP PULSES	300 to 6000 p/s (full scale)	p/s	1	1440		1	Y
	F34	(voltage adjust)	F34	FMP V-ADJ	0%, 1 to 200%	%	1	0		1	Y
5-16	F35	(function)	F35	FMP FUNC	0 to 10	-	-	0		1	Y
	F36	30RY operation mode	F36	30RY MODE	0, 1	-	-	0		1	Y
	F40	Torque limiter1 (driving)	F40	DRV TRQ 1	20 to 150%, 999	%	1	999		1	Y
	F41	(braking)	F41	BRK TRQ 1	0%, 20 to 150%, 999			999		1	
5-17	F42	Torque vector control 1	F42	TRQVECTOR1	0, 1	-	-	0		1	N

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E: Terminal Extensions Functions

Pg.	Func. No.	Name	LCD Display	Setting Range	Unit	Min.	Factory Setting 30 HP	Factory Setting 40 HP	Data Format	Change During op
5-18/21	E01	X1 terminal function	E01 X1 FUNC	0 to 32	-	-	0		1	N
	E02	X2 terminal function	E02 X2 FUNC				1		1	N
	E03	X3 terminal function	E03 X3 FUNC				2		1	N
	E04	X4 terminal function	E04 X4 FUNC				3		1	N
	E05	X5 terminal function	E05 X5 FUNC				4		1	N
	E06	X6 terminal function	E06 X6 FUNC				5		1	N
	E07	X7 terminal function	E07 X7 FUNC				6		1	N
	E08	X8 terminal function	E08 X8 FUNC				7		1	N
	E09	X9 terminal function	E09 X9 FUNC				8		1	N
5-22	E10	Acceleration time 2	E10 ACC TIME2	0.01 to 3600 s	s	0.01	6.00	20.00	12	Y
	E11	Deceleration time 2	E11 DEC TIME2				6.00	20.00	12	Y
	E12	Acceleration time 3	E12 ACC TIME3				6.00	20.00	12	Y
	E13	Deceleration time 3	E13 DEC TIME3				6.00	20.00	12	Y
	E14	Acceleration time 4	E14 ACC TIME4				6.00	20.00	12	Y
	E15	Deceleration time 4	E15 DEC TIME4				6.00	20.00	12	Y
	E16	Torque limiter 2 (driving)	E16 DRV TRQ 2	20 to 150%, 999	%	1	999		1	Y
	E17	(braking)	E17 BRK TRQ 2	0%, 20 to 150%, 999	%	1	999		1	Y
5-22/24	E20	Y1 terminal function	E20 Y1 FUNC	0 to 33	-	-	0		1	N
	E21	Y2 terminal function	E21 Y2 FUNC				1		1	N
	E22	Y3 terminal function	E22 Y3 FUNC				2		1	N
	E23	Y4 terminal function	E23 Y4 FUNC				7		1	N
	E24	Y5A, Y5C terminal function	E24 Y5 FUNC				10		1	N
5-24	E25	Y5 RY operation mode	E25 Y5RY MODE	0,1	-	1	0		1	N
5-25	E30	FAR function (Hysteresis)	E30 FAR HYSTR	0.0 to 10.0 Hz	Hz	0.1	2.5		3	Y
	E31	FDT function (level)	E31 FDT1 LEVEL	0 to120 Hz	Hz	1	60		1	Y
	E32	signal (Hysteresis)	E32 FDT1 HYSTR	0.0 to 30.0 Hz	Hz	0.1	1.0		3	
	E33	OL function (mode select)	E33 OL1 WARNING	0: Thermal calculation 1: Output current	-	-	0		1	
	E34	signal (l (level)	E34 OL1 LEVEL	5 to 150% of rated drive current	A	0.01	motor rated current		19	Y
	E35	(timer)	E35 OL1 TIMER	0.1 to 60.0 s	s	0.1	10.0		3	
	E36	FDT2 function (level)	E36 FDT2 LEVEL	0 to 120 Hz	Hz	1	60		1	
	E37	OL2 function (level)	E37 OL2 LEVEL	5 to 150% of rated drive current	A	0.01	motor rated current		19	Y
5-26	E40	Display coefficient A	E40 COEF A	-999.00 to 999.00	-	0.01	0.01		12	
	E41	Display coefficient B	E41 COEF B	-999.00 to 999.00	-	0.01	0.00		12	Y
	E42	LED Display filter	E42 DISPLAY FL	0.0 to 5.0 s	s	0.1	0.5		3	Y
	E43	LED Monitor (function)	E43 LED MNTR	0 to 12	-	-	0		1	Y
	E44	(display in STOP mode)	E44 LED MNTR2	0, 1	-	-	0		1	Y
5-27	E45	LCD Monitor (function)	E45 LCD MNTR	0, 1	-	-	0		1	Y
	E46	(language)	E46 LANGUAGE	0 to 5	-	-	1		1	Y
	E47	(contrast)	E47 CONTRAST	0(soft) to 10(hard)	-	-	5		1	Y

C:Frequency Control Functions

	C01	Jump (Jump freq. 1)	C01 JUMP Hz 1	0 to 120 Hz	Hz	1	0		1	
	C02	frequency (Jump freq. 2)	C02 JUMP Hz 2				0		1	Y
	C03	(Jump freq. 3)	C03 JUMP Hz 3				0		1	
	C04	(Hysteresis)	C04 JUMP HYSTR	0 to 30 Hz	Hz	1	3		1	
5-28	C05	Multistep (Freq. 1)	C05 MULTI Hz-1	0.00 to 120.00 Hz	Hz	0.01	0.00		5	
	C06	frequency (Freq. 2)	C06 MULTI Hz-2				0.00		5	
	C07	setting (Freq. 3)	C07 MULTI Hz-3				0.00		5	
	C08	(Freq. 4)	C08 MULTI Hz-4				0.00		5	
	C09	(Freq. 5)	C09 MULTI Hz-5				0.00		5	
	C10	(Freq. 6)	C10 MULTI Hz-6				0.00		5	
	C11	(Freq. 7)	C11 MULTI Hz-7				0.00		5	
	C12	(Freq. 8)	C12 MULTI Hz-8				0.00		5	Y
	C13	(Freq. 9)	C13 MULTI Hz-9				0.00		5	
	C14	(Freq. 10)	C14 MULTI Hz-10				0.00		5	
	C15	(Freq. 11)	C15 MULTI Hz-11				0.00		5	
	C16	(Freq. 12)	C16 MULTI Hz-12				0.00		5	
	C17	(Freq. 13)	C17 MULTI Hz-13				0.00		5	
	C18	(Freq. 14)	C18 MULTI Hz-14				0.00		5	
	C19	(Freq. 15)	C19 MULTI Hz-15				0.00		5	

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Pg.	Func. No.	Name	LCD Display		Setting Range	Unit	Min.	Factory Setting 30 HP	Factory Setting 40 HP	Data Format	Change during op
	C20	JOG frequency	C20	JOG Hz	0.00 to 120.00 Hz	Hz	0.01	5.00		5	Y
5-29	C21	PATTERN (mode select) operation	C21	PATTERN	0,1,2	-	-	0		1	N
	C22	(Stage 1)	C22	STAGE 1	Operation time: 0.00 to 6000 s	s	0.01	0.00 F1		13	
	C23	(Stage 2)	C23	STAGE 2	F1 to F4 and R1 to R4			0.00 F1		13	
	C24	(Stage 3)	C24	STAGE 3				0.00 F1		13	
5-29/30	C25	(Stage 4)	C25	STAGE 4				0.00 F1		13	Y
	C26	(Stage 5)	C26	STAGE 5				0.00 F1		13	
	C27	(Stage 6)	C27	STAGE 6				0.00 F1		13	
	C28	(Stage 7)	C28	STAGE 7				0.00 F1		13	
	C30	Frequency command 2	C30	FREQ CMD 2	0 to 11	-	-	2		1	N
5-30	C31	Offset adjust (terminal [12])	C31	BIAS 12	-100.0 to +100.0%	%	0.1	0.0		4	Y
	C32	(terminal [C1])	C32	GAIN 12	0.0 to +200.0%	%	0.1	100.0		3	Y
5-31	C33	Analog setting signal filter	C33	REF FILTER	0.00 to 5.00s	s	0.01	0.05		5	Y
P:Motor Parameters											
	P01	Number of motor 1 poles	P01	M1 POLES	2 to 14	-	2	4		9	N
5-32	P02	Motor 1 (capacity)	P02	M1-CAP	Up to 30 HP: 0.01 to 60 HP 40 HP and above: 0.01 to 600 HP	Hp	0.01	motor capacity		5	N
	P03	(rated current)	P03	M1-Ir	0.00 to 2000 A	A	0.01	motor rated current		19	N
	P04	(tuning)	P04	M1 TUN1	0, 1, 2	-	-	0		21	N
	P05	(on-line tuning)	P05	M1 TUN2	0, 1	-	-	0		1	N
	P06	(no-load current)	P06	M1-Io	0.00 to 2000 A	A	0.01	standard rated value		19	N
5-33	P07	(%R1 setting)	P07	M1-%R1	0.00 to 50.00%	%	0.01	standard rated value		5	Y
	P08	(%X setting)	P08	M1-%X	0.00 to 50.00%	%	0.01	standard rated value		5	Y
	P09	Slip compensation control	P09	SLIP COMP1	0.00 to 15.00 Hz	Hz	0.01	0.00		5	Y
H:High Performance Functions											
	H03	Data initializing	H03	DATA INIT	0, 1	-	-	0		1	N
	H04	Auto-reset (times)	H04	AUTO-RESET	0, 1 to 10 times	-	1	0		1	Y
5-34	H05	(reset interval)	H05	RESET INT	2 to 20 s	s	1	5		1	Y
	H06	Fan stop operation	H06	FAN STOP	0, 1	-	-	0		1	Y
	H07	ACC/DEC pattern (mode select)	H07	ACC PTN	0,1,2,3	-	-	0		1	N
5-35	H08	Rev. phase sequence lock	H08	REV LOCK	0, 1	-	-	0		1	N
	H09	Start mode	H09	START MODE	0, 1, 2	-	--	0		1	N
	H10	Energy-saving operation	H10	ENERGY SAV	0, 1	-	-	1		1	Y
	H11	DEC mode	H11	DEC MODE	0, 1	-	-	0		1	Y
	H12	Instantaneous OC limiting	H12	INST CL	0, 1	-	-	1		1	N
5-36	H13	Auto-restart (restart time)	H13	RESTART t	0.1 to 10.0 s	s	0.1	0.1	0.5	3	N
	H14	(freq. fall rate)	H14	FALL RATE	0.00 to 100.00 Hz/s	Hz/s	0.01	10.00		5	
	H15	(holding DC voltage)	H15	HOLD V	3-phase, 230V class: 200 to 300V 3-phase, 460V class: 400 to 600V	V	1	200V class: 235V 400V class: 470V		1	Y
	H16	(OPR command self hold time)	H16	SELFHOLD t	0.0 to 30.0 s, 999	s	0.1	999		3	N
5-37	H19	Active drive	H19	AUT RED	0, 1	-	-	0		1	Y
	H20	PID control (mode select)	H20	PID MODE	0, 1, 2	--	-	0		1	N
5-38	H21	(feedback signal)	H21	FB SIGNAL	0, 1, 2, 3	-	-	1		1	N
	H22	(P-gain)	H22	P-GAIN	0.01 to 10.00 times	-	0.01	0.1		5	Y
5-39/40	H23	(I-gain)	H23	I-GAIN	0.0, 0.1 to 3600 s	s	0.1	0.0		3	Y
	H24	(D-gain)	H24	D-GAIN	0.00 s , 0.01 to 10.0 s	s	0.01	0.00		5	Y
	H25	(feedback filter)	H25	FB FILTER	0.0 to 60.0 s	s	0.1	0.5		3	Y
5-41	H26	PTC thermistor (mode select)	H26	PTC MODE	0, 1			0		1	Y
	H27	(level)	H27	PTC LEVEL	0.00 to 5.00V	V	0.01	1.60		5	Y
	H30	Serial link (function select)	H30	LINK FUNC	0, 1, 2, 3	-	-	0		1	Y
	H31	Modbus-RTU (address)	H31	ADDRESS	0 (broadcast), 1 to 247	-	1	1		1	N
	H32	(mode select on no response error)	H32	MODE ON ER	0, 1, 2, 3	-	-	0		1	Y
5-42	H33	(timer)	H33	TIMER	0.0 to 60.0 s	s	-	2.0		3	Y
	H34	(baud rate)	H34	BAUD RATE	0, 1, 2, 3	-	-	1		1	Y
	H35	(data length)	H35	LENGTH	0 (8-bit fixed)	-	-	0		1	Y
	H36	(parity check)	H36	PARITY	0, 1, 2	-	-	0		1	Y
	H37	(stop bits)	H37	STOP BITS	0 (2-bit), 1(1-bit)	-	-	0		1	Y
5-43	H38	(no response error detection time)	H38	NO RES t	0 (no detection), 1 to 60 s	s	1	0		1	Y
	H39	(response interval)	H39	INTERVAL	0.00 to 1.00 s	s	0.01	0.01		5	Y

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A: Alternative Motor Parameters

Pg.	Func. No.	Name	LCD Display		Setting Range	Unit	Factory Setting Min.	Factory Setting 30 HP	Factory Setting 40 HP	Data Format	Change During op
5-44	A01	Maximum frequency 2	A01	MAX Hz-2	50 to 120 Hz	Hz	1	60		1	N
	A02	Base frequency 2	A02	BASE Hz-2	25 to 120 Hz	Hz	1	60		1	N
	A03	Rated voltage 2 (at Base frequency 2)	A03	RATED V-2	0 230V class: 80 to 240V 460V class: 320 to 480V	V	1	230V class: 230 460V class: 460		1	N
	A04	Maximum voltage 2	A04	MAX V-2	230V class: 80 to 240V 460V class: 320 to 480V	V	1	230V class: 230 460V class: 460		1	N
	A05	Torque boost 2	A05	TRQ BOOST2	0.0, 0.1 to 20.0	-	-	2.0		3	Y
	A06	Electronic (select)	A06	ELCTRN OL2	0, 1, 2	-	-	1		1	Y
	A07	thermal 2 (level)	A07	OL LEVEL2	20% to 135% if INV rated current	A	0.01	motor rated current		19	Y
	A08	(thermal time constant)	A08	TIME CNST2	0.5 to 75.0 min	min	0.1	5.0	10.0	3	Y
	A09	Torque vector control 2	A09	TRQVECTOR2	0, 1	-	-	0		1	N
	A10	Number of motor 2 poles	A10	M2 POLES	2 to 14 poles	pole	2	4		9	N
	A11	Motor 2 (capacity)	A11	M2-CAP	Up to 30 HP: 0.01 to 60 HP 40 HP and above: 0.01 to 600 HP	HP	0.01	motor capacity		5	N
	A12	(rated current)	A12	M2-Ir	0.00 to 2000 A	A	0.01	motor rated current		19	N
5-45	A13	(tuning)	A13	M2 TUN1	0, 1, 2	-	-	0		21	N
	A14	(on-line tuning)	A14	M2 TUN2	0, 1	-	-	0		1	N
	A15	(no-load current)	A15	M2-Io	0.00 to 2000 A	A	0.01	standard rated value		19	N
	A16	(%R1 setting)	A16	M2-%R1	0.00 to 50.00%	%	0.01	standard rated value		5	Y
	A17	(%X setting)	A17	M2-%X	0.00 to 50.00%	%	0.01	standard rated value		5	Y
	A18	(slip compensation control 2)	A18	SLIP COMP2	0.00 to 15.00 Hz	Hz	0.01	0.00		5	Y

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Protective Operations

List of Protective Functions

In the event of an abnormality in the inverter's operation, the protective function will activate immediately to trip the inverter and display the alarm name on the LED monitor while the motor coasts to a stop. A list of the alarms with their explanations is included in the table below, and troubleshooting charts in Section 7.

Table 6.1.1 List of Alarms and Causes

Alarm Name	Keypad Panel Display		Cause of Activation	
	LED	LCD		
Overcurrent	OC1	OC DURING ACC	During acceleration	If the inverter output current momentarily exceeds the overcurrent detection level, due to an overcurrent in the motor, or a short-circuit or ground fault in the output circuit, the protective function is activated during heavy load.
	OC2	OC DURING DEC	During deceleration	
	OC3	OC AT SET SPD	Running at constant speed	
Ground fault	EF	GROUND FAULT	If a ground fault in the inverter output circuit is detected, the protective function is activated (for 40 Hp or more only). If a ground fault occurs in an inverter rated at 30 Hp or less, the inverter is protected by the overcurrent protection. If protection against personal injury or property damage is required, install a separate ground-fault protective relay or ground leakage circuit breaker.	
Overvoltage	OU1	OV DURING ACC	During acceleration	If the DC link voltage in the main circuit exceeds the overvoltage detection level (230V series: 400V DC, 460V series: 800V DC), due to an increase in the regenerating current from the motor, the output is shut down. However, protection against inadvertent overvoltage (e.g., high-voltage line) may not be provided
	OU2	OV DURING DEC	During deceleration	
	OU3	OV AT SET SPD	Running at constant speed	
Undervoltage	LU	UNDERVOLTAGE	If the DC link voltage in the main circuit falls below the undervoltage detection level (230V series: 400V DC, 460V series: 800V DC) due to a lowered power supply, the output is shut down. If function F14 Restart after momentary power failure was selected, an alarm is not displayed. In addition, if the supply voltage falls to a level unable to maintain control power, an alarm may not be displayed.	
Input phase loss	Lin	PHASE LOSS	If input power L1/R, L2/S and L3/T has any phase of the 3 phase power "OPEN" or if there is a significant disparity between the phases, the retifying diodes or smoothing capacitors may be damaged. An Alarm is displayed and the protective function is activated during heavy load.	
Overheating of heat sink	OH1	FIN OVERHEAT	If the temperature of the heat sink rises due to a cooling fan failure, or the temperature of the heatsink is too low, the protective function is activated during heavy load.	
External alarm	OH2	EXT ALARM	If the external alarm contacts on the braking unit, braking resistor, or external thermal O/L relay are connected to the control circuit terminals (THR), the contacts will be actuated according to contact signals.	
Overheating internally	OH3	HIGH AMB TEMP	If the temperature inside the inverter rises due to poor ventilation, etc., the protective function is activated.	
Overheating of braking resistor	dbH	DBR OVERHEAT	If electronic thermal O/L relay (for braking resistor) function F13 is selected, the protective function is activated to prevent the resistor from burning due to overheating caused by frequent use of the braking resistor.	
Motor 1 overload	OL1	MOTOR1 OL	The protective function is activated if the motor current exceeds the preset level, provided that electronic thermal O/L relay 1 function F10 has been selected.	
Motor 2 overload	OL2	MOTOR2 OL	If the second motor current exceeds the preset level when the operation is switched to drive the second motor, the protective function is activated, provided that electronic thermal O/L relay 2 of function A04 was selected.	
Drive overload	OLU	INVERTER OL	If the output current exceeds the rated overload current, the protective function is activated to provide thermal protection against overheating of the semiconductor elements in the inverter's main circuit.	
Blown fuse	FUS	DC FUSE OPEN	If the fuse in the inverter is blown out following a short-circuit or damage to the internal circuit, the protective function is activated (for 40 Hp or more only).	
Memory error	Er1	MEMORY ERROR	If a memory error occurs, such as missing or invalid data, the protective function is activated.	
Keypad panel communication error	Er2	KEYPD COM ERR	If a communication error or interrupt between the keypad panel and control circuit is detected, the protective function is activated.	
CPU error	Er3	CPU ERROR	If a CPU error occurs due to noise, etc., the protective function is activated.	
Option error	Er4	OPTN COM ERR	Error occurred while using an optional unit.	
	Er5	OPTION ERROR		
Operating error	Er6	OPR PROCD ERR	Detects drive operating procedure error during drive startup. FWD or REV connected to terminal CM when Main power is applied to drive (F02 setting 3 or 4). Stop key on keypad is pressed in terminal operation (F02 setting 1 or 3). Detected timed alarm stop command.	
Output wiring error	Er7	TUNING ERROR	If there is an open circuit or connection error in the inverter output wiring during an auto-tuning procedure, the protective function is activated.	
Modbus RTU error	Er8	RS485 COM ERR	If an error occurs while using Modbus-RTU, the protective function is activated.	

Note: Number in fron of Alarm Code indicates multiple alarms. See page 4-15.

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Alarm Reset

To release the trip status, enter the reset command by pressing the RESET key on the keypad panel or sending the appropriate signal to the RST terminal after removing the cause of the trip. Since the reset command is an edge operation, input a command sequence such as OFF-ON-OFF as shown in Fig.6-2-1.

When releasing the trip status, set the operation command to OFF. If the operation command is set to ON, inverter will start operation after resetting.

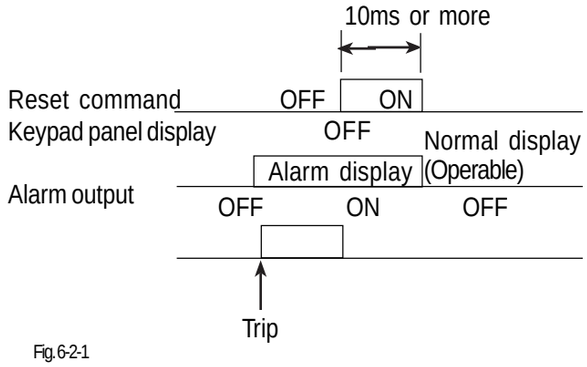


Fig.6-2-1

WARNING

If the alarm reset is activated with the operation signal ON, the inverter will restart suddenly, which may be dangerous. To ensure safety, disable the operating signal when releasing the trip status, as accident may result.

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Warranty Parts and Service

The purpose of this section is to provide specific instructions to the user of the standard drive referenced in this book regarding warranty administration and how to obtain assistance on both in-warranty and out-of-warranty equipment.

For all warranty procedures, refer to section 10 of this instruction manual to identify the part or assembly.

If assistance is required to determine warranty status, identify defective parts, or obtain the name of your local distributor, call:

Saftronics, Inc.

Technical Support
5580 Enterprise Parkway
Ft. Myers, FL 33905
Phone: 941-693-7200
Fax: 941-693-2431

Before calling the number at left to determine warranty status, the drive serial number will be required. This is located on the drive nameplate. If the drive is still under warranty, further information will be required per the "In-Warranty Failure Checklist" shown on page 9-2 of this instruction manual. Please complete and return the Warranty Registration Card located inside back cover.

OUT-OF WARRANTY PROCEDURES

When the defective part has been identified, contact your local authorized Saftronics drives distributor to order replacement parts.

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Replacement Parts

Catalog No.	Rating	Drive HP & Quantity per drive											
		1/4	1/2	1	2	3	5	7.5	10	15	20	25	30
GP10 230VAC, 30HP and Below													
Main Control Card													
SG11CPCBB1		1	1	1	1	1	1	1	1	1	1	1	1
Gate Driver & Power Supply Card													
SG11PPCBG2002		1											
SG11PPCBG2004			1										
SG11PPCBG2008				1									
SG11PPCBG2015					1								
SG11PPCBG2022						1							
SG11PPCBG2037							1						
SG11PPCBG2055								1	1				
SG11PPCBG2075										1			
SG11PPCBG2110											1		
SG11PPCBG2150												1	
SG11PPCBG2185													1
KEYPAD PANEL (Only one type per drive)													
STPAG11S	NEMA Type1	1	1	1	1	1	1	1	1	1	1	1	1
STPAG11S4	NEMA Type4	1	1	1	1	1	1	1	1	1	1	1	1
CAPACITOR UNIT		*	*	*									
SG11CAP01	PCB				1								
SG11CAP02	PCB					1							
SG11CAP03	PCB						1						
SG11CAP09	2700µFx1							1	1		2		
SG11CAP10	3900µFx1									1		2	
SG11CAP11	4700µFx2												2
	* Located on Gate drive & Power supply Card												
FAN													
SG11FAN01					1	1	1						
SG11FAN202								1	1	1	2	2	2
POWER MODULE		*	*	*									
SPS11046	30A 600V				1	1							
SPS11047	50A 600V						1						
S6MBP75RS060	75A 600V							1	1				
S6MBP100RS060	100A 600V									1			
S6MBP150RS060	150A 600V										1	1	
S6MBP200RS060	200A 600V												1
	* Located on Gate drive & Power supply Card												
RECTIFIER MODULE		*	*	*	*	*	*						
SPVC758	75A 800V							1	1	1			
SCLK120AA80	120A 800V										1	1	
SCLK180AA80	180A 800V												1
	* Located on Gate drive & Power supply Card												
CHARGE RESISTOR		*	*	*	*	*	*						
S30W66	30W 6.6WJ							1	1	1			
S80W25	80W 2.5WJ										1	1	1
	* Located on Gate drive & Power supply Card												
FRONT COVER													
SG11UPCG008P		1	1	1									
SG11UPCG040P					1	1	1						
SG11UPCG075P								1	1	1			
SG11UPCG220P											1	1	1
INTERNAL DB RESISTOR													
SG11DBR0082	100W 40W	1	1	1									
SG11DBR0372	40W 80W				1	1	1						
SG11DBR0752								1	1				

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Catalog No.	Rating	Drive HP & Quantity per drive						
		40	50	60	75	100	125	150
GP10 230 VAC, 40HP and Above								
Main Control Card								
SEP4113B1		1	1	1	1	1	1	1
Gate Driver & Power Supply Card								
SEP3956C1		1	1					
SEP3956C2				1				
SEP3956C3					1	1		
SEP3957C1							1	
SEP3957C2								1
KEYPAD PANEL								
STPAG11S4		1	1	1	1	1	1	1
DC CAPACITOR								
SLNT2G302MSMAFF	400V 3000µF	4	4					
SHCGHA2G362N3K	400V 3600µF			4				
SHCGHA2G452NE3K	400V 4500µF				4			
SHCGHA2G592N3K	400V 5900µf					4	5	6
FAN								
SFBA09A24H1B0		1	1	1	2	2	2	4
(Standard)								
S4715PS22TB30		2	2					
2750MTP15				2	2		3	4
S6250MG1	80W 7.5ohm					2		
(For NEMA12 Heatsink)								
SUHS4556MLOT1		2	2					
S2750MTP15OT1				2	2		3	4
SU6250MKG1LTPOT1						2		
IGBT MODULE								
S2MBi300NB060		3	3					
SCM400DU12H206				3				
S2MBi300NB06001					6	6	9	12
RECTIFIER MODULE								
SPD1008AC		3	3	6	6	9	9	9
CHARGE RESISTOR								
SHF5C5504		1	1	1	1	1	2	2
DC CONTACTOR								
SFC3UL	AC220VAUX2B	1	1					
SFC1UL	AC220VAUX2B			2	2	2		
SFC4UL	AC220VAUX2B						2	
SSC7NUL	AC200-240V							1
DC FUSE								
SCR2L260UL		1	1	1				
SCR2L400UL					1	1		
SA50P6004							1	1
INPUT MODULE CARD								
SEP3985C1		1	1	1	1	1		
SEP3985C3							1	1

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Catalog No.	Rating	Drive HP & Quantity per drive										
		1/2	1	2	3	5	7.5	10	15	20	25	30
GP10 460 VAC, 30HP and Below												
Main Control Card												
SG11CPCBB1		1	1	1	1	1	1	1	1	1	1	1
Gate Driver & Power Supply Card												
SG11PPCBG4004		1										
SG11PPCBG4008			1									
SG11PPCBG4015				1								
SG11PPCBG4022					1							
SG11PPCBG4037						1						
SG11PPCBG4055							1	1				
SG11PPCBG4075									1			
SG11PPCBG4110										1		
SG11PPCBG4150											1	
SG11PPCBG4185												1
KEYPAD PANEL (Only one type per drive)												
STPAG11S	NEMA Type1	1	1	1	1	1	1	1	1	1	1	1
STPAG11S4	NEMA Type4	1	1	1	1	1	1	1	1	1	1	1
CAPACITOR UNIT		*	*									
SG11CAP04	PCB			1								
SG11CAP05	PCB				1							
SG11CAP06	PCB					1						
SG11CAP07	1500µFx2						2	2				
SG11CAP08	2000µFx2								2			
SG11CAP09	2700µFx2									2		
SG11CAP10	3900µFx2										2	
SG11CAP11	4700µFx2											2
	* Located on Gate drive & Power supply Card											
FAN												
SG11FAN01				1	1	1						
SG11FAN02							1	1	1	2	2	2
POWER MODULE		*	*									
SPS12046	15A 1200V			1	1							
SPS12047	25A 1200V					1						
S6MBP50RS120	50A 1200V						1	1	1			
S6MBP75RS120	75A 1200V									1	1	
S6MBP100RS120	100A 1200V											1
	* Located on Gate drive & Power supply Card											
RECTIFIER MODULE		*	*	*	*	*						
SPVC7516	75A 1600V						1	1	1			
SCLK70AA160	70A 1600V									1	1	
SCLK100AA160	100A 1600V											1
	* Located on Gate drive & Power supply Card											
CHARGE RESISTOR		*	*	*	*	*						
S30W200	30W 20WJ						1	1	1			
S80W100	80W 10WJ									1	1	1
	* Located on Gate drive & Power supply Card											
FRONT COVER												
SG11UPCG008P		1	1									
SG11UPCG040P				1	1	1						
SG11UPCG075P							1	1	1			
SG11UPCG220P										1	1	1

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Catalog No.	Rating	Drive HP & Quantity per drive															
		40	50	60	75	100	125	150	200	250	300	350	400	450	500	600	700	800
GP10 460VAC, 40HP and Above																		
Main Control Card																		
SEP4113B1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gate Driver & Power Supply Card																		
SEP3959C1		1	1															
SEP3959C2				1														
SEP3959C3					1	1												
SEP3959C4							1											
SEP3959C5								1	1									
SEP3957C3										1	1							
SEP3957C4												1	1	1				
SEP3957C5															1	1	1	1
GATE DRIVE AMPLIFIER CARD																		
SEP4142															3	3	3	3
KEYPAD PANEL																		
STPAG11S4		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DC CAPACITOR																		
SLNT2G302MSMAFF	400V 3000µF	4	4															
SHCGHA2G362N3K	400V 3600µF			4														
SHCGHA2G452NE3K	400V 4500µF				4			6										
SHCGHA2G592N3K	400V 5900µf					4	4		6	8		12						
SHCGHA2G742N3K	400V 7400µF										8		12	12				
SHCGHA2G932N3KG	400V 9300µF														20	20	26	26
FAN UNIT																		
SFBA09A24H1B0		1	1	1	1	1	2	2	2	3	3	4	4	4	4	4		
SMRS18-DUL															3	3	4	4
STHB1-UHS4556M																	4	4
S(Standard)																		
S4715PS22TB30		2	2															
S2750MTP15				2	2			3	3									
S6250MG1						2	2			3	3	4	4	4				
(For NEMA12 Heatsink)																		
SUHS4556MLOT1		2	2															
S2750MTP15OT1				2	2			3	3									
SU6250MKG1LTPOT1						2	2			3	3	4	4	4				
IGBT MODULE																		
S2MBi150PC14002		3	3															
SCM200DU24H203				3														
S2MBi300P14002					3	3												
SCM200DU24H202							6											
S2MBi300P14003								6	6	9	9	12	12	12	18	18	24	24
RECTIFIER MODULE																		
SPD6016A		3	3	3						12	12							
SPD10016A					3	3	6	6	6			12	12	12	24	24	30	30

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Catalog No.	Rating	Drive HP & Quantity per drive																
		40	50	60	75	100	125	150	200	250	300	350	400	450	500	600	700	800
GP10 460VAC, 40HP and Above																		
IGBT MODULE																		
S2MBi150PC14002		3	3															
SCM200DU24H203				3														
S2MBi300p14002					3	3												
SCM200DU24H202							6											
S2MBi300P14003								6	6	9	9	12	12	12	18	18	24	24
RECTIFIER MODULE																		
SPD6016A		3	3	3						12	12							
SPD10016A					3	3	6	6	6			12	12	12	24	24	30	30
CHARGE RESISTOR																		
SHF5C5504	80W 7.5ohm	1	1	1	1	1	1	2	2	2	3	3	4	4				
SGRZG400															2	2	2	2
DC CONTACTOR																		
SFC1UL	AC220VAUX2B	1	1	1	1	1	2	2	2									
SFC4UL	AC220VAUX2B									2	2							
SSC7NUL	AC200-240V											1						
SSC8NUL	AC200-240V												1	1				
SSCN8	AC200-240V														2	2	2	2
DC FUSE																		
SCR6L150UL	600V 150A	1	1	1														
SCR6L200UL	600V 200A				1													
SCR6L300UL	600V 300A					1	1											
SA70Q4004								1	1									
SA70Q5004										1								
SA70Q6004											1	1						
SA70QS8004													1	1				
SA70P16004TA															1	1		
SA70P20004																	1	1
TRANSFORMER																		
SHF5C55025512VA		1	1															
SHF5C550312524VA				1	1	1	1											
SHF5B661330016VA								1	1	1	1	1	1	1				
SHF5B395170020VA															1	1	1	1
INPUT MODULE CARD																		
SEP3985C2		1	1	1	1	1	1	1	1									
SEP3985C4										1	1	1	1	1	1	1	1	1

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Three-phase 230V series - Variable Torque

Type designation GP10E1ST32_ _ _ ** (NEMA Type1) GP10E2ST32_ _ _ ** (NEMA Type12) GP10E4ST32_ _ _ ** (NEMA Type4) GP10E8ST32_ _ _ ** (Open, Type 12 Heatsink) GP10E9ST32_ _ _ ** (Open) ** Indicates product revision			F25	F50	001	002	003	005	007	010	015	020	025	030	040	050	060	075	100	125	150
Nominal 230V system applied mot		HP	/41	1/2	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150
Output ratings	Rated Capacity *1)	kVA	0.59	1.1	1.9	3.1	4.3	6.7	8.7	11	16	21	26	31	45	57	71	85	112	137	165
	Rated Voltage *2)	V	3-phase, 200V /50Hz; 200V ,220V ,230V /60Hz																		
	Rated Current *3)	A	1.5	3.0	5.0	8.0	11	17	22	29	42	55	67	78	115	145	180	215	283	346	415
	Overload Capability		110% of rated current for 1min																		
	Rated Frequency	Hz	50, 60Hz																		
Input rating	Phases, Voltage, Frequency		3-phase, 200 to 230V , 50/60Hz												3-phase, 200 to 220V /50Hz , 200 to 230V /60Hz						
	Voltage / frequency variations		-Voltage : +10 to -15% (Voltage unbalance *5) : 2% or less												-Frequency :+5 to -5%						
	Momentary voltage dip capability *6)		When the input voltage is 165V or more, the inverter can be operated continuously. If the AC Line voltage is below rated, the drive will not provide the 15ms ride-thru. The smooth recovery method is selectable.																		
Output frequency	Setting	Maximum Freq.	50 to 120Hz																		
		Base Freq.	25 to 120Hz																		
		Starting Freq.	0.1 to 60Hz , Continuous time : 0.0 to 10.0s																		
		Carrier Freq. *8)	0.75 to 15kHz The minimum carrier frequency changes depend on maximum output frequency.												0.75 to 10kHz					0.75 to 6kHz	
	Accuracy (Stability)		-Analog setting : ±0.2% of Maximum frequency (at 25 ±10 degrees C) -Digital setting : ±0.01% of Maximum frequency (at -10 to +50 degrees C)																		
	Setting resolution		-Analog setting : 1/3000 of Maximum frequency ex.) 0.02Hz at 60Hz , 0.04Hz at 120Hz -Digital setting : 0.01Hz at Maximum frequency of up to 99.99Hz (0.1Hz at Maximum frequency of 100Hz and above) -Link setting :Two methods are selectable. 1/20000 of Maximum frequency ex. 0.003Hz at 60Hz 0.01Hz (Fixed)																		
Control	Volt/Freq Characteristic		80 to 240V (with AVR control) at base and maximum frequency, adjustable																		
	Torque boost		Constant torque load / Variable torque load Automatic (setting code) 0.0 / - Manual (setting code) 2.0 to 20.0 / 0.1 to 1.9																		
Enclosure			NEMA Type1, Type4												NEMA Type1, Type12				Open, Open with NEMA Type 12 Heatsink, NEMA 1		
Cooling method			Natural			Fan cooling															
Standards			-UL/cUL -LOW VOLTAGE directive -EMC directive -IEC 61800-2 (Rating, specifIcations for low voltage adjustable frequency a.c. power drive systems) -IEC 61800-3 (EMC product standard including specific test methods)																		

NOTES

*1) Inverter output capacity [kVA] at 230V.

*2) Output voltage is proportional to the power supply voltage and can't exceed the power supply voltage.

*3) Current derating may be required in case of low impedance load such as high frequency motor.

*5) Reference to the IEC 61800-3(5.2.3)

$$\text{Unbalance in power supply voltage [\%]} = \frac{\text{(Maximum voltage[V] - Minimum voltage[V])}}{\text{3-phase averaging voltage[V]}} \cdot 100 \ [\%]$$

*6) 85% load

*8) If carrier frequency is set at more than 10kHz and an overheat condition (detected by internal thermal sensor) occurs, drive will automatically reduce carrier frequency to 8kHz , in order to avoid trip. (Available up to 30HP unit)

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Three-phase 460V series - Variable Torque

Type designation GP10E1ST34___** (NEMA Type1) GP10E2ST34___** (NEMA Type12) GP10E4ST34___** (NEMA Type 4) GP10E8ST34___** (Open, Type 12 Heatsink) GP10E9ST34___** (Open)			F50	001	002	003	005	007	010	015	020	025	030	040	050	060	075	100	125	150	200	250	300	350	400	450	500	600	700	800
Norminal 460V system applied motor		HP	1/2	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	200	250	300	350	400	450	500	600	700	800
	Rated Capacity *1)	kVA	1.1	1.9	2.9	4.3	7.1	9.9	13.1	18.3	23.9	29.4	35.0	47	59	72	89	119	140	167	242	242	300	330	386	414	578	590	669	765
	Rated Voltage *2)	V	3-phase, 380V , 400V , 415V /50Hz , 380V , 400V , 440V , 460V /60Hz																										
	Rated Current *3)	A	1.5	2.5	3.7	5.5	9.0	12.5	16.5	23	30	37	44	60	75	91	112	150	176	210	304	304	377	415	485	520	650	740	840	960
	Overload Capability		110% of rated current for 1min ,											110% of rated current for 1min ,															
	Rated Frequency	Hz	50, 60Hz																										
Input ratings	Phases, Voltage, Frequency		3-phase, 380 to 480V , 50/60Hz											3-phase, 380 to 440V /50Hz , 380 to 480V /60Hz * 380V/50Hz and 380 to 415V/60Hz *4)																
	Voltage / frequency variations		-Voltage : +10 to -15% (Voltage unbalance *5) : 2% or less -Frequency :+5 to -5%																										
	Momentary voltage dip capability *6)		When the input voltage is 310V or more, the inverter can be operated continuously. If the AC Line voltage is below rated, the drive will not provide the 15ms ride-thru. The smooth recovery method is selectable.																										
Output frequency	Setting	Maximum Freq.	50 to 120Hz																										
		Base Freq.	25 to 120Hz																										
		Starting Freq.	0.1 to 60Hz , Continuous time : 0.0 to 10.0s																										
		Carrier Freq. *8)	0.75 to 15kHz The minimum carrier frequency changes depend on maximum output frequency.											0.75 to 10kHz					0.75 to 6kHz										
	Accuracy (Stability)		-Analog setting : ±0.2% of Maximum frequency (at 25 ±10 degrees C) -Digital setting : ±0.01% of Maximum frequency (at -10 to +50 degrees C)																										
	Setting resolution		-Analog setting : 1/3000 of Max. frequency ex.) 0.02Hz at 60Hz , 0.04Hz at 120Hz -Digital setting : 0.01Hz at Maximum frequency of up to 99.99Hz (0.1Hz at Maximum frequency of 100Hz and above) -Link setting : Two methods are selectable. 1/20000 of Maximum frequency ex. 0.003Hz at 60Hz 0.01Hz (Fixed)																										
Control	Volt/Freq Characteristic		320 to 480V (with AVR control) at base and maximum frequency, adjustable																										
	Torque boost		Constant toruque load / Variable torque load Automatic (setting code) : 0.0 / - Manual (setting code) : 2.0 to 20.0 / 0.1 to 1.9																										
Enclosure			NEMA Type1, Type 4											NEMA Type1, Type12				Open, Open with NEMA Type 12 Heatsink, NEMA Type 1											
Cooling method			Natural											Fan cooling															
Standards			-UL/cUL -LOW VOLTAGE directive -EMC directive -IEC 61800-2 (Rating, specifications for low voltage adjustable frequency a.c. power drive systems) -IEC 61800-3 (EMC product standard including specific test methods)																										

NOTES
*1) Inverter output capacity [kVA] at 460V.
*2) Output voltage is proportional to the power supply voltage and can't exceed the power supply voltage.
*3) Current derating may be required in case of low impedance load such as high frequency motor.
*4) Change the tap of auxiliary transformer.
380V/50Hz and 380 to 415V/60Hz : Change over CN UX connector from U1 part to U2 part. (Reference to the Instruction manual)

Input voltage	CN UX connector
400 to 440V/50Hz, 440 to 480V/60Hz	U1 (Factory setting)
380V/50Hz (398V or smaller), 380 to 415V/60Hz (430V or smaller)	U2

*5) Reference to the IEC 61800-3(5.2.3)

$$\text{Unbalance in power supply voltage [\%]} = \frac{\text{(Maximum voltage[V] - Minimum voltage[V])}}{\text{3-phase averaging voltageV}} \text{ - 100 [\%]}$$

*6) 85% load
*8) If carrier frequency is set at more than 10kHz and an overheat condition (detected by internal thermal sensor) occurs, drive will automatically reduce carrier frequency to 8kHz , in order to avoid trip. (Available up to 30HP unit)

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Three-phase 230V series - Constant Torque

Type designation (* * indicate product revision) GP10E1ST32_ _ _* * (NEMA Type1) GP10E2ST32_ _ _* * (NEMA Type12) GP10E4ST32_ _ _* * (NEMA Type4) GP10E8ST32_ _ _* * (Open, Type 12 Heatsink) GP10E9ST32_ _ _* * (Open)			F25	F50	001	002	003	005 007	010	015	020	025	030	040	050	060	075	100	125	150
Nominal 230V system pplied moto		HP	1/4	1/2	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125
Output ratings	Rated Capacity *1)	kVA	0.59	1.1	1.9	3.1	4.3	6.7	9.9	13	18	23	29	34	45	57	71	85	112	137
	Rated Voltage *2)	V	3-phase, 200V /50Hz , 200V ,220V ,230V /60Hz																	
	Rated Current *3)	A	1.5	3.0	5.0	8.0	11	17	25	33	46	59	74	87	115	145	180	215	283	346
	Overload Capability		150% of rated current for 1min , 200% of rated current for 0.5s												150% of rated current for 1min , 180% of rated current for 0.5s					
	Rated Frequency	Hz	50, 60Hz																	
Input ratings	Phases, Voltage, Frequency		3-phase, 200 to 230V , 50/60Hz												3-phase, 200 to 220V /50Hz, 200 to 230V /60Hz * 220 to 230V /50Hz *4),					
	Voltage / frequency variations		-Voltage : +10 to -15% (Voltage unbalance *5) : 2% or less) -Frequency :+5 to -5%																	
	Momentary voltage dip capability *6)		When the input voltage is 165V or more, the inverter can be operated continuously. When the input voltage drops below 165V from rated voltage, the inverter can be operated for 15ms . (within 85% load of nominal applied motors) The smooth recovery method is selectable.																	
Output frequency	Setting	Maximum Freq.	50 to 120Hz *11)																	
		Base Freq.	25 to 120Hz *11)																	
		Starting Freq.	0.1 to 60Hz, Continuous time : 0.0 to 10.0s																	
		Carrier Freq. *8)	0.75 to 15kHz The minimum carrier frequency changes depend on maximum output frequency.												0.75 to 10kHz			0.75 to 6kHz		
	Accuracy (Stability)		-Analog setting : +/- 0.2% of Maximum frequency (at 25 10 degrees C) -Digital setting : +/- 0.01% of Maximum frequency (at -10 to +50 degrees C)																	
	Setting resolution		-Analog setting : 1/3000 of Maximum frequency ex.) 0.02Hz at 60Hz -Digital setting : 0.01Hz at Maximum frequency of up to 99.99Hz (0.1Hz at Maximum frequency of 100Hz and above) -Link setting : Two methods are selectable. · 1/20000 of Maximum frequency ex.) 0.003Hz at 60Hz · 0.01Hz (Fixed)																	
Control	Volt/Freq Characteristic		80 to 240V (with AVR control) at base and maximum frequency, adjustable																	
	Torque boost		Constant toruque load / Variable torque load Automatic (setting code) : 0.0 / - Manual (setting code) : 2.0 to 20.0 / 0 .1 to 1.9 *9)																	
	Starting torque		200% (with Dynamic torque vector control selected)												180% (with Dynamic torque vector control selected)					
Braking	Standard	Braking torque	150%			100%					20% *10)				15 to 10% *10)					
		Time s	10	5		5					No limit									
		Duty cycle %	10	5	3	5	3	2	3	2	No limit									
	Options	Braking torque	150%												100%					
		Time s	90	45	45	45	30	20			10			8	1	0				
		Duty cycle %	37	22	18	10	7	5			5			5	10					
	DC injection braking		Starting frequency : 0.1 to 60.0Hz , Braking time : 0.0 to 30.0s , Braking level : 0 to 100% of rated current																	
Enclosure			NEMA Type1, Type4								NEMA Type1, Type12				Open, Open with NEMA Type 12 Heatsink, NEMA 1					
Cooling method			Natural			Fan cooling														
Standards			-UL/cUL -LOW VOLTAGE directive -IEC 61800-2 (Rating, specifications for low voltage adjustable frequency a.c. power drive -EMC directive -IEC 61800-3 (EMC product standard including specific test methods)																	

NOTES
*1) Inverter output capacity [kVA] at 230V.
*2) Output voltage is proportional to the power supply voltage and can't exceed the power supply voltage.
*3) Current derating may be required in case of low impedance load such as high frequency motor.
*4) 220 to 230V/50Hz : Order individually
*5) Reference to the IEC 61800-3(5.2.3)

$$\text{Unbalance in power supply voltage [\%]} = \frac{(\text{Maximum voltage[V]} - \text{Minimum voltage[V]})}{\text{3-phase averaging voltage[V]}} \times 100 \quad [\%]$$

*6) Input power : 85%
*8) If carrier frequency is set at more than 10kHz and an overheat condition (detected by internal thermal sensor) occurs,inverter will automatically reduce carrier frequency to 8kHz , in order to avoid trip.(Available up to 30HP unit)
*9) When setting into 0.1,the starting torque gets 50%
*10) With a nominal applied motor.(Average torque when the motor decelerates and stops from 60Hz. It may change according to the motor loss.)
*11) Above 120Hz application, please contact the factory.

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Three-phase 460V series-Constant Torque

Type designation (* * indicate product revision) GP10E1ST34_ _ _* * (NEMA Type1) GP10E2ST34_ _ _* * (NEMA Type12) GP10E4ST34_ _ _* * (NEMA Type 4) GP10E8ST34_ _ _* * (Open, Type 12 Heatsink) GP10E9ST34_ _ _* * (Open)			F50	001	002	003	005/007	010	015	020	025	030	040	050	060	075	100	125	150	200	250	300	350	400/450	500	600	700	800
Norminal 460V system applied motor		HP	1/2	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	200	250	300	350	400	450	500	600
	Rated Capacity *1)	kVA	1.1	1.9	2.9	4.3	7.1	10	14	19	23	31	35	47	59	72	89	119	140	167	201	242	300	330	414	466	518	590
	Rated Voltage *2)	V	3-phase, 380V , 400V , 415V /50Hz , 380V , 400V , 440V , 460V /60Hz																									
	Rated Current *3)	A	1.5	2.5	3.7	5.5	9.0	13	18	24	30	39	45	60	75	91	112	150	176	210	253	304	377	415	520	585	650	740
	Overload Capability		110% of rated current for 1min , 200% of rated current for 0.5s										150% of rated current for 1min , 180% of rated current for 0.5s															
	Rated Frequency	Hz	50, 60Hz																									
Input ratings	Phases, Voltage, Frequency		3-phase, 380 to 480V, 50/60Hz										3-phase, 380 to 440V /50Hz , 380 to 480V /60Hz *380V/50Hz and 380 to 415V/60Hz *4)															
	Voltage / frequency variations		-Voltage : +10 to -15% (Voltage unbalance *5) : 2% or less) -Frequency : +5 to -5%																									
	Momentary voltage dip capability *6)		When the input voltage is 310V or more, the inverter can be operated continuously. When the input voltage drops below 310V from rated voltage, the inverter can be operated for 15ms . (less than 85% load of nominal applied motors) The smooth recovery method is selectable.																									
Output frequency	Setting	Maximum Freq.	50 to 120Hz *10)																									
		Base Freq.	25 to 120Hz *10)																									
		Starting Freq.	0.1 to 60Hz , Continuous time : 0.0 to 10.0s																									
		Carrier Freq. *8)	0.75 to 15kHz The minimum carrier frequency changes depend on maximum output frequency.										0.75 - 10kHz					0.75 to 6kHz										
	Accuracy (Stability)		-Analog setting : ±0.2% of Maximum frequency (at 25 ±10 degrees C) -Digital setting : ±0.01% of Maximum frequency (at -10 to +50 degrees C)																									
	Setting resolution		-Analog setting : 1/3000 of Max. frequency ex.) 0.02Hz at 60Hz , 0.15Hz at 400Hz -Digital setting : 0.01Hz at Maximum frequency of up to 99.99Hz (0.1Hz at Maximum frequency of 100Hz and above) -Link setting : Two methods are selectable. 1/20000 of Maximum frequency ex.) 0.003Hz at 60Hz, 0.01Hz at 400Hz 0.01Hz (Fixed)																									
Control	Volt/Freq Characteristic		320 to 480V (with AVR control) at base and maximum frequency, adjustable																									
	Torque boost												Constant torque load Automatic (setting code) 0.0 Manual (setting code) 2.0 to 20.0					Variable torque load - 0.1 to 1.9 *9)									
	Starting torque		200% (with Dynamic torque vector control selected)															180% (with Dynamic torque vector control selected)										
Braking	Standards	Braking torque	150%				100%						20% *11)	15 to 10% *11)														
		Time s	5				5						No limit															
		Duty cycle %	5	3	5	3	2	3	2	No limit																		
	Options	Braking torque	150%											100%														
		Time s	45		45		30	20		10			8	1	0													
		Duty cycle %	22		10		7	5		5			5	10														
	DC injection braking		Starting frequency : 0.1 to 60.0Hz , Braking time : 0.0 to 30.0s, Braking level : 0 to 100% of rated current																									
Enclosure			NEMA Type1, Type 4										NEMA Type1, Type12	Open, Open with NEMA Type 12 Heatsink, NEMA Type 1														
Cooling method			Natural	Fan cooling																								
Standards			-UL/cUL -LOW VOLTAGE directive -IEC 61800-2 Rating, -EMC directive -IEC 61800-3 (EMC product specifications for low voltage adjustable frequency a.c. standard including specific test methods) power drive systems)																									

NOTES

*1) Inverter output capacity [kVA] at 460V.
*2) Output voltage is proportional to the power supply voltage and can't exceed the power supply voltage.
*3) Current derating may be required in case of low impedance load such as high frequency motor.
*4) Change the tap of auxiliary transformer.
380V/50Hz and 380 to 415V/60Hz : Change over CN UX connector from U1 part to U2 part. (Reference to the Instruction manual)

Input voltage	CN UX connector
400 to 440V/50Hz, 440 to 480V/60Hz	U1 (Factory setting)
380V/50Hz (398V or smaller), 380 to 415V/60Hz (430V or smaller)	U2

*5) Reference to the IEC 61800-3(5.2.3)

$$\text{Unbalance in power supply voltage [\%]} = \frac{\text{(Maximum voltage[V] - Minimum voltage[V])}}{\text{3-phase averaging voltageV}} \times 100 \text{ [\%]}$$

*6) Input power : 85%
*8) If carrier frequency is set at more than 10kHz and an overheat condition (detected by internal thermal sensor) occurs, inverter will automatically reduce carrier frequency to 8kHz , in order to avoid trip.(Available up to 30HP unit)
*9) When setting into 0.1, the starting torque gets 50%
*10) Above 120Hz application, please contact the factory
*11) With a nominal applied motor (Average torque when the motor decelerates and stops from 60Hz. It may change according to the motor loss.)

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2. Common Specifications

Item			Explanation
Control	Control Method		Sinusoidal wave PWM control (with V/F control, torque vector control.)
	Output frequency	Maximum frequency	50 to 120 Hz variable setting
		Base frequency	25 to 120 Hz variable setting
		Starting frequency	0.1 to 60 Hz variable setting Holding time: 0.0 to 10.0 s
		Carrier frequency	0.75 to 15k Hz (30 HP or less) 0.75 to 10k Hz (40-100 HP) 0.75 to 6kHz (125HP or more)
		Accuracy (stability)	Analog setting: +/- 0.2% or less of the max. frequency (at 25 +/- 10°C) Digital Setting: +/- 0.01% or less of the max frequency (-10 to +50°C)
		Setting resolution	Analog setting: 1/3000 of max. frequency (e.g. 0.02 Hz / 60 Hz, 0.05 Hz / 150 Hz) Digital setting: 0.01 Hz (99.99 Hz or less), 0.1 Hz (100.0 Hz or more)
	Voltage/frequency Characteristics		Output voltage at base frequency can be adjusted separately, such as 80 to 240V (200V series) or 320 to 480V (400V series)
	Torque Boost		Auto: Optimum control corresponding to the load torque. Manual: 0.1 to 20.0 code setting (energy savings reduced torque, constant torque (strong) etc.)
	Accelerating/decelerating time		0.01 to 3600s Four accelerating and decelerating time settings are possible independent of each other by selecting digital input signals.
			In addition to linear acceleration and deceleration, either S-shaped acceleration/deceleration (weal/strong) or curvilinear acceleration/deceleration
			Starting frequency: 0.0 to 60 Hz, braking time: 0.0 to 30.0s Braking levels: 0 to 80%
	Function equipped		Frequency upper and lower limiter, bias frequency, frequency gain, jump frequency, pick-up operation, restart after momentary power failure, switching operation from line to drive, slip compensation control, automatic energy saving operation, regeneration avoiding control, droop control, torque limiting (2-strp), torque control, PID control, second motor switching, cooling fan ON/OFF control.
Operation	Operation method		Keypad panel: Run by FWD REV keys, stop by STOP key. Terminal input: Forward/Stop command, Reverse/Stop command, Coast-to-Stop command, Alarm reset, acceleration/deceleration selection, multistep frequency
	Frequency setting		Keypad panel: setting by UP and DOWN keys External potentiometer: External freq. Setting POT (VR) (1 to 5k ohm) Analog input: 0 to +10V (0 to 5V), 4 to 20 mA, o to ± 10V (FWD/REV operation) +10 to 0 (reverse operation), 20 to 4 mA (reverse operation) UP/DOWN control: Frequency increases or decreases as long as the digital input signals are turned on Multistep frequency selection: Up to 15 steps are selectable by a combination of digital input signals (four kinds) Link operation: Operation by RS485 (standard) Program operation: Pattern operation by program Jogging operation: Jogging operation by FWD, REV key or digital input signals.
	Operation status signal		Transistor output (4 signals): Running, frequency, arrival, frequency detection, overload early warning, etc. Relay output (2 signals): Alarm output (for any fault), multi-purpose output signals Analog output (1 signal): Output frequency, output current, output voltage, output torque, power consumption, etc. Pulse output (1 signal): Output frequency, output current, output power, output torque, power consumption, etc.

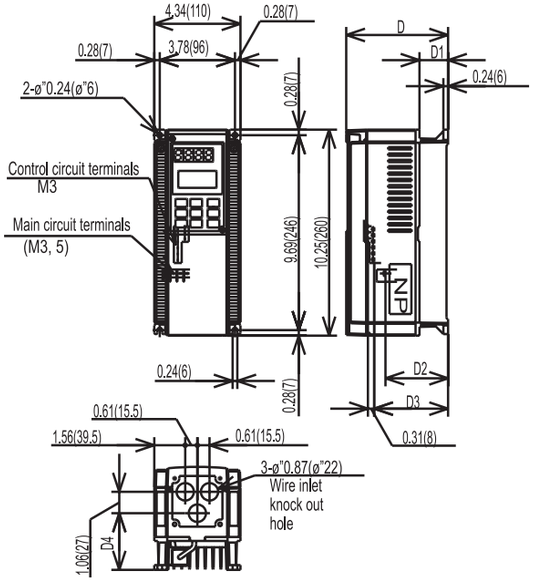
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Common Specifications (continued)

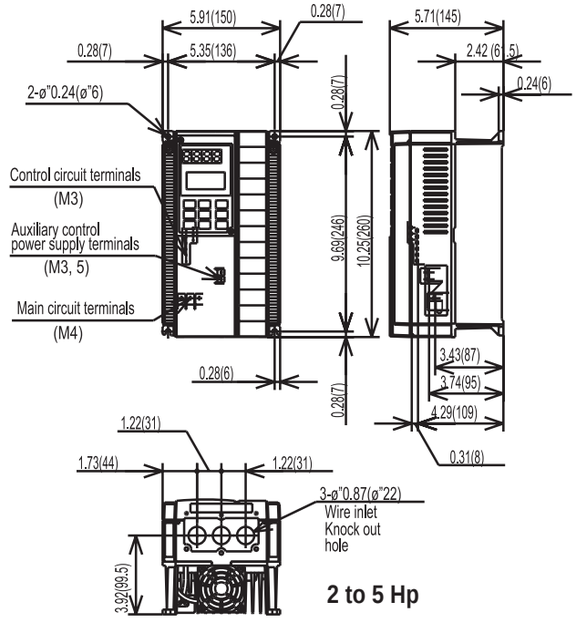
	Item		Explanation
Indication	Digital display LED		Output frequency, setting frequency, output current, output voltage, motor synchronous speed, line speed, load rotation speed, calculated PID value, PID command value, PID feedback value, alarm code.
	Liquid crystal display		Operation information, operational guide, functional code/name/setting data, alarm information, tester function, motor load rate measuring function (Maximum/average current (rms) during measuring period, maintenance information (integrated operation hours, capacitance measurement for main circuit capacitors, heatsink temperature, etc.
	Language		Six languages (Japanese, English, German, French, Spanish, Italian)
	Lamp display		Charging (voltage residual), operation indication
	Protective function		Overcurrent, short-circuit, ground fault, overvoltage, undervoltage, overload, overheating, blown fuse, motor overload, external alarm, input open-phase, output open0phase (when tuning), braking resistor protection, CPU and memory error, keypad panel communications error, PTC thermistor protection, surge protection, stall prevention, etc.
Environment	Installation location		Indoor, altitude less than 3300 feet (1000m), free from corrosive gas, dust and direct sunlight.
	Ambient temperature		-10 to +50°C (+14 to 122°F) (ventilating cover must be removed under conditions exceeding +40°C (+104°F) for models rated at 30 HP or less)
	Vibration		3mm peak from 2-9 Hz, 9.8 m/s^2 from 9-20 Hz, 2m/s^2 from 20-55 Hz, 1 m/s^2 from 55-200 Hz,
	Storage	Ambient temperature	-25 to 65°C (-13 to 149°F)
		Ambient humidity	5 to 95% (no condensation)

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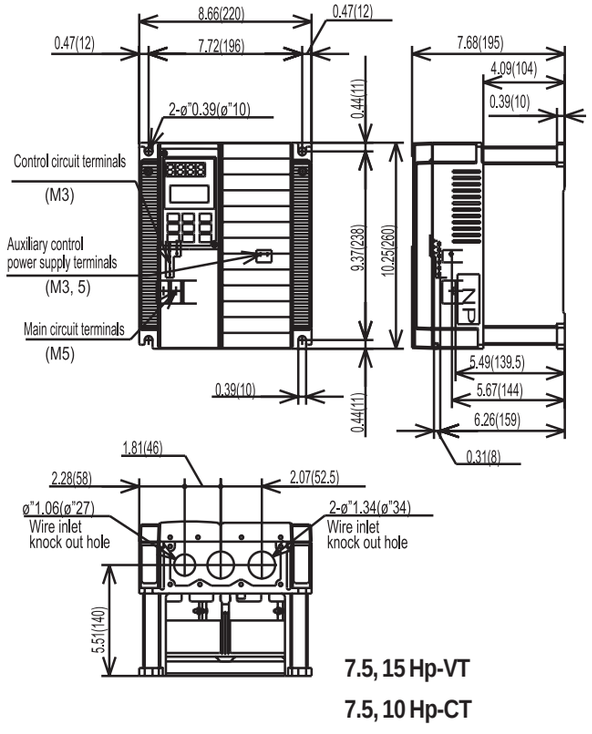
Outline Dimensions-Variable Torque, Constant Torque



Type	D	D1	D2	D3	D4
1/4, 1/2 Hp	5.12 (130)	1.44 (26.5)	3.15 (80)	3.7 (94)	2.81 (71.5)
1 Hp	5.71 (145)	2.03 (51.5)	3.74 (95)	4.29 (109)	3.41 (86.5)

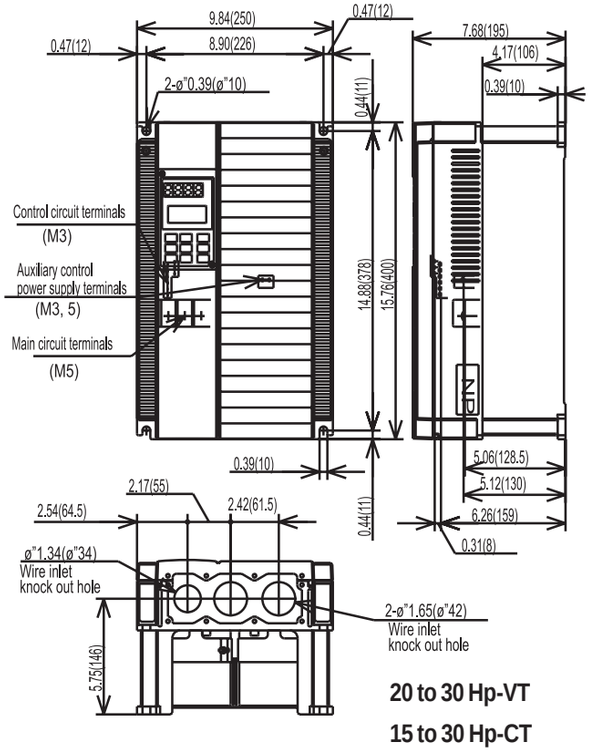


2 to 5 Hp



7.5, 15 Hp-VT

7.5, 10 Hp-CT

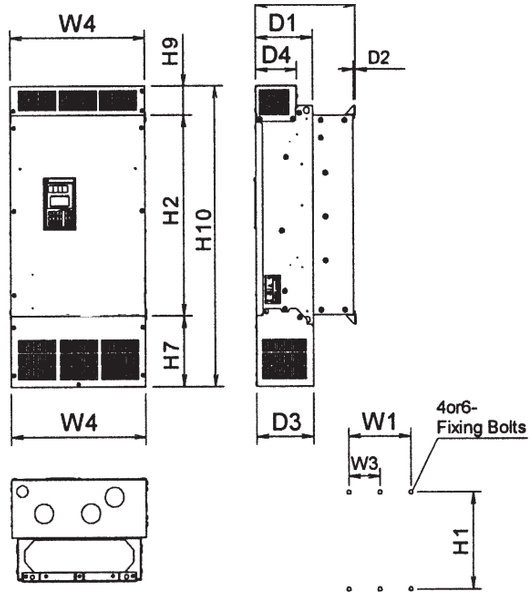


20 to 30 Hp-VT

15 to 30 Hp-CT

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Outline Dimensions NEMA 1-Variable/Torque, Constant Torque



230V Series NEMA 1-Variable/Torque, Constant Torque

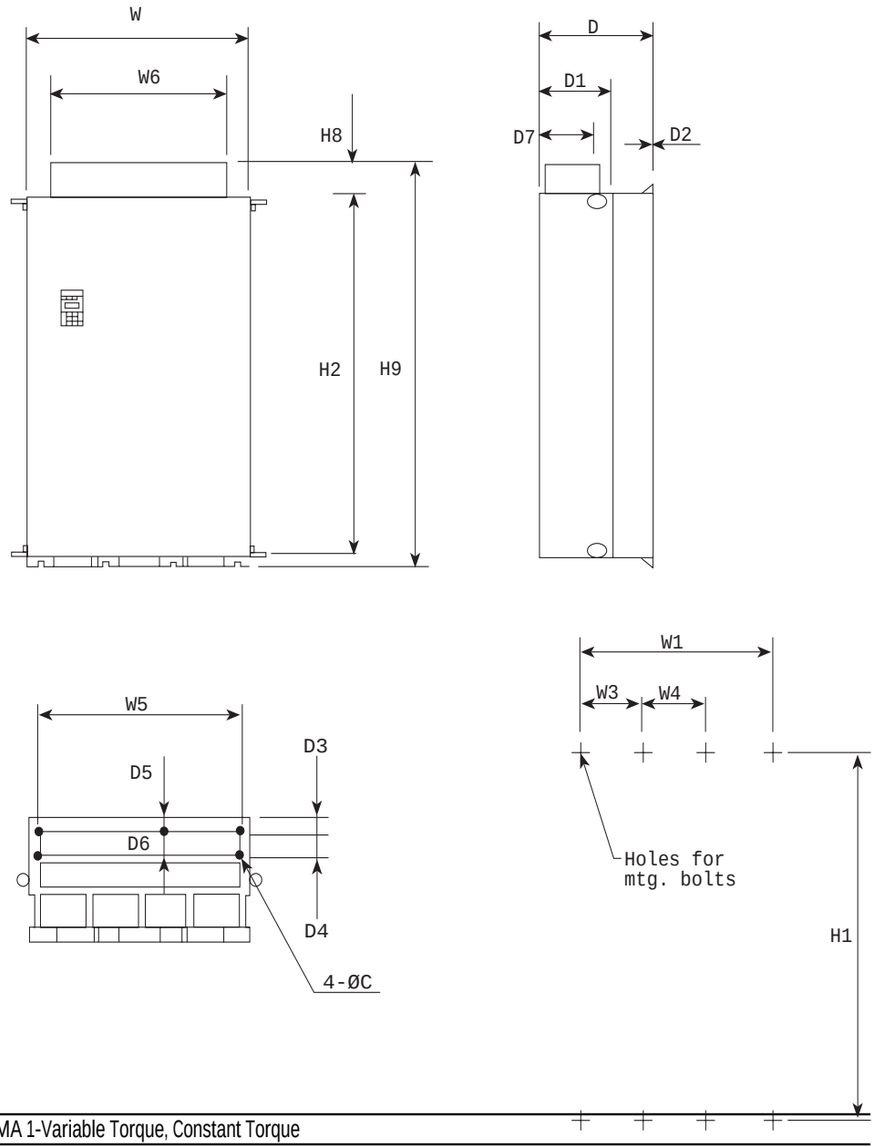
Hp	DIMENSIONS inches (mm)														Mtg.	Wt.
	W1	W3	W4	H1	H2	H3	H6	H7	H9	H10	D	D2	D3	D4	Bolts	Lb (kg)
40/30	9.4	–	13.5	20.9	19.7	20.2	0.4	7.1	3	29.7	10	0.2	5.7	4.1	M8	70
50/40	(240)		(342)	(530)	(500)	(512)	(9)	(180)	(75)	(755)	(255)	(4)	(145)	(105)		(32)
60/50	10.8		14.9	23.4	22.2	22.7		7.9		33.1	10.6					86
	(275)		(377)	(595)	(565)	(577)		(200)		(840)	(270)					(39)
75/65				28.3	27.2	27.6				38						106
				(720)	(690)	(702)				(965)						(48)
100/75																110
																(50)
125/100	16.9		21		27	27.4	0.5	11.1	3.3	41.3	11.2			3.6	M12	172
	(430)		(533)		(685)	(695)	(13)	(283)	(83)	(1050)	(285)			(91)		(78)
150/125	22.8	11.4	26.9	33.5	32.1	32.5		15.1		50.4	14.2		8.7	6.5		282
	(580)	(290)	(683)	(850)	(815)	(825)		(383)		(1280)	(360)		(220)	(166)		(128)

460V Series NEMA 1-Variable/Torque, Constant Torque

Hp	DIMENSIONS inches (mm)														Mtg.	Wt.
	W1	W3	W4	H1	H2	H3	H6	H7	H9	H10	D	D2	D3	D4	Bolts	Lb (kg)
40/30	9.4	–	13.5	20.9	19.7	20.2	0.4	7.1	3	29.7	10	0.2	5.7	4.1	M8	70
50/40	(240)		(342)	(530)	(500)	(512)	(9)	(180)	(75)	(755)	(255)	(4)	(157)	(105)		(32)
60/50	10.8		14.9								10.6					82
	(275)		(377)								(270)					(37)
75/65				25.8	24.6	25.1				34.6						95
				(655)	(625)	(637)				(880)						(43)
100/75																97
																(44)
125/100				28.3	27.2	27.6		7.9		38						115
				(720)	(690)	(702)		(200)		(965)						(52)
150/125	16.9		21	28	26.6	27	0.5	8.2	3.3		12.4		6.9	4.7	M12	174
200/150	(430)		(533)	(710)	(675)	(685)	(13)	(208)	(83)		(315)		(175)	(121)		(79)
250/200				38	37	37		13		53.1	14.2		8.7	7		245
300/250				(970)	(935)	(945)		(333)		(1350)	(360)		(220)	(166)		(111)
350/300	22.8	11.4	26.9					15.1		55.1						337
400/350	(580)	(290)	(683)					(383)		(1400)						(153)
450/350																

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Surface Mount



460V Series NEMA 1-Variable Torque, Constant Torque

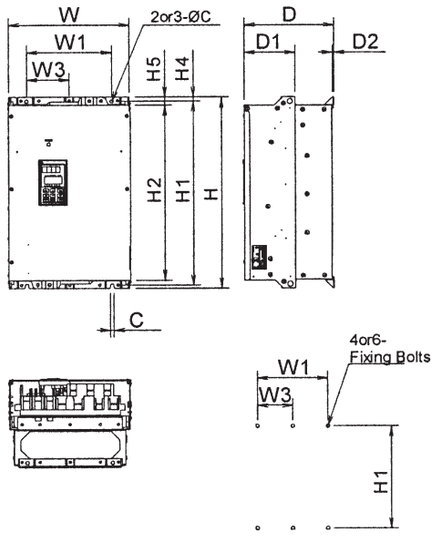
Hp	DIMENSIONS inches (mm)												
	W	W1	W3	W4	W5	W6	H1	H2	H4	H8	H9	D	D1
500/400	26.8	22.8	11.4	–	24.0	21.9	53.9	52.4	52.6	3.3	57.1	17.7	11.2
600/450	(680)	(580)	(290)		(610)	(555)	(1370)	(1330)	(1335)	(084)	(1450)	(450)	(285)
700/500	34.6	30.7	10.2	10.2	31.9	29.7							
800/600	(880)	(780)	(260)	(260)	(810)	(755)							

Hp	DIMENSIONS inches (mm)							
							Mtg. Bolts	Wt. Lb (kg)
	D2	D3	D4	D5	D6	D7		
500/400	0.3	2.0	3.9	1.4	4.5	8.7	M12	562
600/450	(6)	(50)	(100)	(35)	(115)	(220)		(255)
700/500								804
800/600								(365)

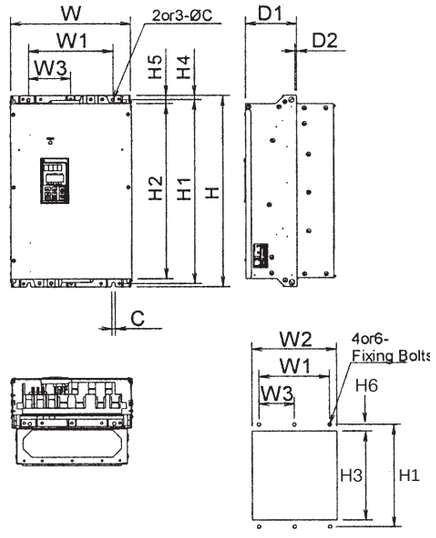
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Outline Dimensions Open Type-Variable Torque/ Constant Torque

Surface Mount



Through Panel Mount



230V Series-Variable Torque, Constant Torque

Hp	DIMENSION Inch (mm)															Mtg.	Weight
230V	W	W1	W2	W3	H	H1	H2	H3	H4	H5	H6	D	D1	D2	C	Bolts	Lb (kg)
40/30	13.4	9.4	12.8		21.7	20.9	19.7	20.2	0.5	1	0.4	10	5.7	0.2	0.4	M8	64
50/40	(340)	(240)	(326)		(550)	(530)	(500)	(512)	(12)	(25)	(9)	(255)	(145)	(4)	(10)		(29)
	14.8	10.8	14.2		24.2	23.4	22.2	22.7				10.6					79
60/50	(375)	(275)	(361)		(615)	(595)	(565)	(577)				(270)					(36)
					29.1	28.3	27.2	27.6									97
75/65					(740)	(720)	(690)	(702)									(44)
																	101
100/75																	(46)
	20.9	16.9	20.1		29.5		27	27.4	0.6	1.3	0.5	11.2			0.6	M12	154
125/100	(530)	(430)	(510)		(750)		(685)	(695)	(16)	(33)	(13)	(285)			(15)		(70)
	26.8	22.8	26		34.6	33.5	32.1	32.5				14.2	8.7				253
150/125	(680)	(580)	(660)		(880)	(850)	(815)	(825)				(360)	(220)				(115)

460V Series-Variable Torque, Constant Torque

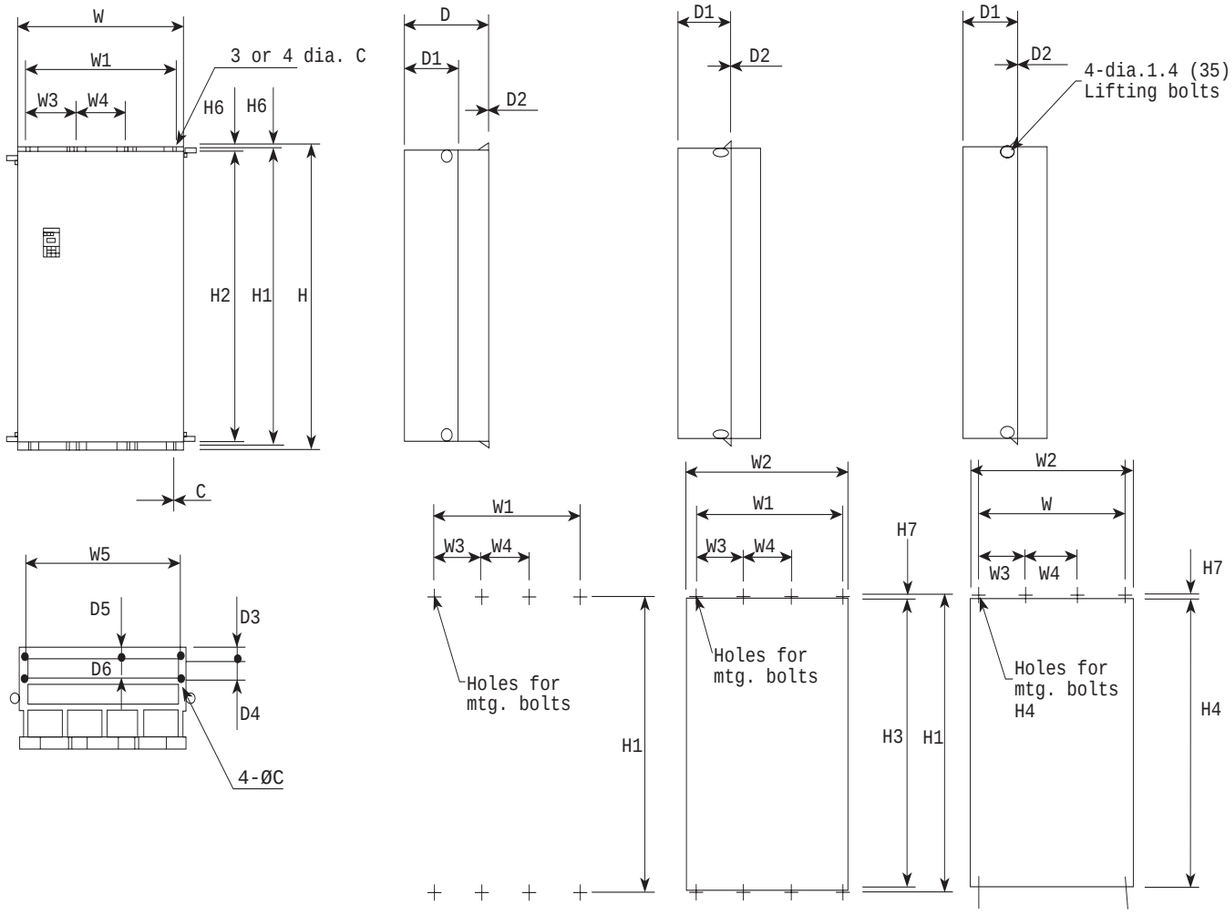
Hp	DIMENSION Inch (mm)															Mtg.	Weight
460V	W	W1	W2	W3	H	H1	H2	H3	H4	H5	H6	D	D1	D2	C	Bolts	Lb (kg)
40/30	13.4	9.4	12.8		21.7	20.9	19.7	20.2	0.5	1	0.4	10	5.7	0.2	0.4	M8	64
50/40	(340)	(240)	(326)		(550)	(530)	(500)	(512)	(12)	(25)	(9)	(255)	(145)	(4)	(10)		(29)
	14.8	10.8	14.2									10.6					75
60/50	(375)	(275)	(361)									(270)					(34)
					26.6	25.8	24.6	25.1									86
75/65					(675)	(655)	(625)	(637)									(39)
																	88
100/75																	(40)
					29.1	28.3	27.2	27.6									106
125/100					(740)	(720)	(690)	(702)									(48)
150/125	20.9	16.9	20.1			28	26.6	27	0.6	1.3	0.5	12.4	6.9		0.6	M12	154
200/150	(530)	(430)	(510)			(710)	(675)	(682)	(16)	(33)	(13)	(315)	(175)		(15)		(70)
250/200					39.4	38.2	36.8	37.2				14.2	8.7				220
300/250					(1000)	(970)	(935)	(945)				(360)	(220)				(100)
350/300	26.8	22.8	26	11.4													308
400/350	(680)	(580)	(660)	(290)													(140)
450/350																	

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Surface Mount

Through Panel Mount

Alternative Through Panel Mount (bottom bracket support by customer supply.



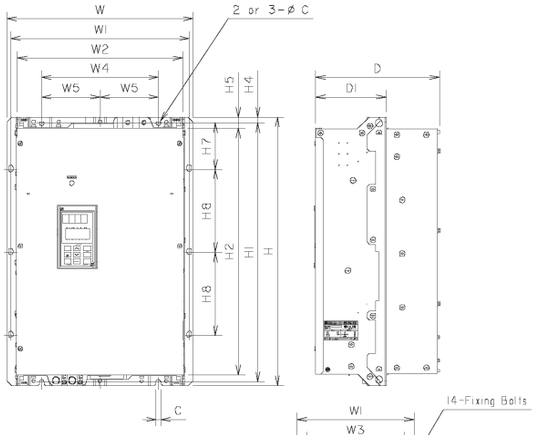
460V Series Open Type-Variable Torque, Constant Torque

Hp	DIMENSIONS inches (mm)															
	W	W1	W2	W3	W4	W5	H	H1	H2	H3	H4	H5	H6	H7	D	D1
500/400	26.8	22.8	26.0	11.4	–	24.0	55.1	53.9	52.4	52.8	52.6	0.6	1.4	0.6	17.7	11.2
600/450	(680)	(580)	(660)	(290)		(610)	(1400)	(1370)	(1330)	(1340)	(1335)	(016)	(035)	(015)	(450)	(285)
700/500	34.6	30.7	33.8	10.2	10.2	31.9										
800/600	(880)	(780)	(860)	(260)	(260)	(810)										

Hp	DIMENSIONS inches (mm)						Mtg. Bolts	Wt. Lb (kg)
	D2	D3	D4	D5	D6	C		
500/400	0.3	2	3.9	1.4	4.5	0.6	M12	551
600/450	(6)	(50)	(100)	(35)	(115)	(015)		(250)
700/500								793
800/600								(360)

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Outline Dimensions Open Type with NEMA 12 Heatsink



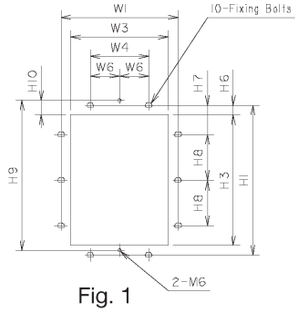


Fig. 1

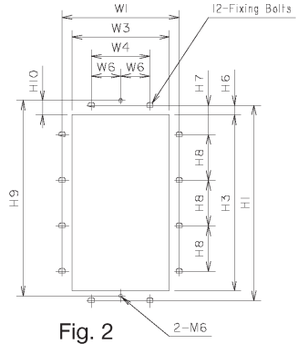


Fig. 2

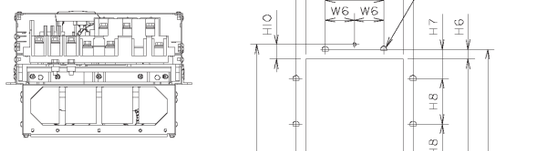


Fig. 3

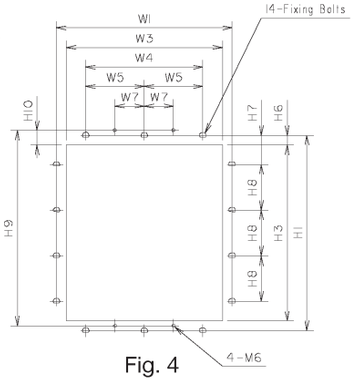


Fig. 4

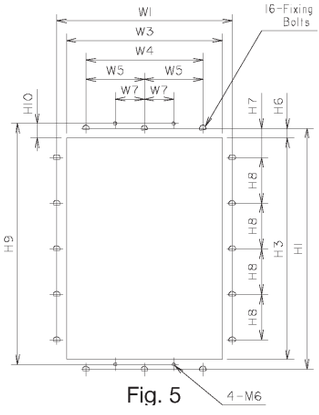
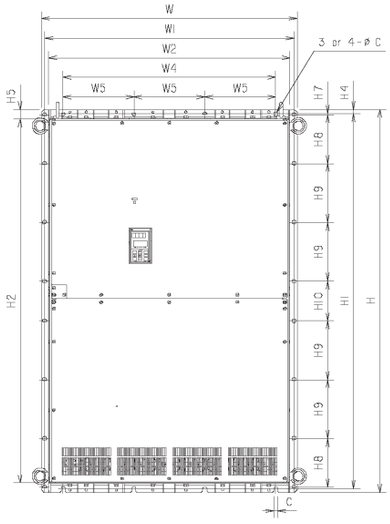
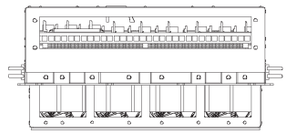


Fig. 5





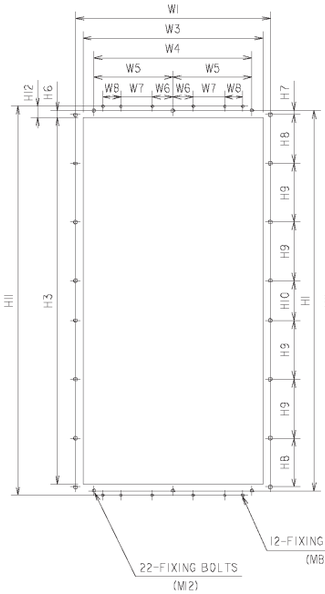


Fig. 6

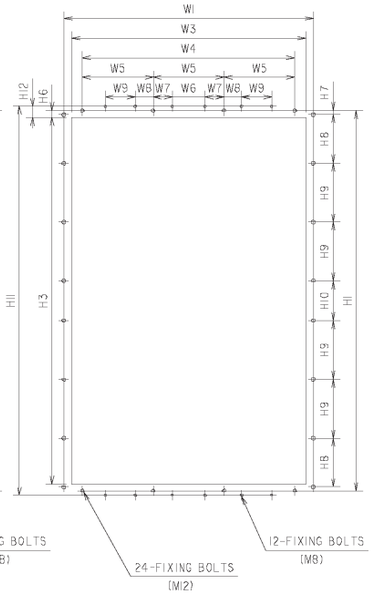


Fig. 7

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GP10 230 VAC Series-Variable Torque, Constant Torque

HP	DIMENSIONS Inch(mm)																									Fixing	Wt.	Fig
	W	W1	W2	W3	W4	W5	W6	W7	W8	W9	H	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	C	D	D1	Bolts	Lb(kg)	
40/30	15.04	14.41	13.39	12.83	9.45		4.72				21.65	20.87	19.69	20.16				3.74		20.87					8.86			66	1
50/40	(382)	(366)	(340)	(326)	(240)		(120)				(550)	(530)	(500)	(512)				(95)		(530)					(225)			(30)	
60/50											24.21	23.43	22.24	22.72	0.47	0.98	0.35	1.67	6.69	23.43	0.43			0.4		5.71	M6	81	
	16.42	15.79	14.76	14.21	10.83		5.41				(615)	(595)	(565)	(577)	(12)	(25)	(9)	(42.5)	(170)	(595)	(11)			(10)	10.63	(145)	and	(37)	
75/60	(417)	(401)	(375)	(361)	(275)	-	(137.5)	-	-	-	29.13		27.17	27.64				4.13				-	-		(270)		M8	99	
											(740)	28.35	(690)	(702)				(105)		28.35								(45)	2
100/95												(720)								(720)								104	
																												(47)	
125/100	23.23	22.28	20.87	20.08	16.93		8.46				29.53		26.97	27.36				1.75	8.27						11.22	5.71	M6	161	
	(590)	(566)	(530)	(510)	(430)		(215)				(750)		(685)	(695)	0.61	1.28	0.49	(44.5)	(210)		0.51			0.6	(285)	(145)	and	(73)	
150/125	29.13	28.19	26.77	25.98	22.83	11.42	-	2.95			34.65	33.46	32.09	32.48	(15.5)	(32.5)	(12.5)	4.02	8.46	33.46	(13)			(15)	14.17	8.66	M12	260	4
	(740)	(716)	(680)	(660)	(580)	(290)		(75)			(880)	(850)	(815)	(825)				(102)	(215)	(850)					(360)	(220)		(118)	

GP10 460 VAC Series-Variable Torque, Constant Torque

HP	DIMENSIONS Inch(mm)																									Fixing	Wt	Fig
	W	W1	W2	W3	W4	W5	W6	W7	W8	W9	H	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	C	D	D1	Bolts	Lb(kg)	
40/30	15.04	14.41	13.39	12.83	9.45		4.72																		8.86			66	
50/40	(382)	(366)	(340)	(326)	(240)		(120)				21.65	20.87	19.69	20.16				3.74		20.87					(225)			(30)	1
60/50											(550)	(530)	(500)	(512)				(95)		(530)							M6	77	
															0.47	0.98	0.35		6.69		0.43			0.4		5.71	and	(35)	
75/60	16.42	15.79	14.76	14.21	10.83		5.41				26.57	25.79	24.61	25.08	(12)	(25)	(9)	2.85	(170)	25.79	(11)			(10)	10.63	(145)	M8	88	
	(417)	(401)	(375)	(361)	(275)		(137.5)				(675)	(655)	(625)	(637)				(72.5)		(655)					(270)			(40)	
100/75						-		-	-	-																		90	2
																												(41)	
125/100											29.13	28.35	27.17	27.64				4.13		28.35								108	
											(740)	(720)	(690)	(702)				(105)		(720)		-	-					(49)	
150/125											29.13	27.95	26.57	26.97				1.56	8.27	27.95					12.4	6.89		161	
											(740)	(710)	(675)	(685)				(39.5)	(210)	(710)					(315)	(175)			
200/150	23.23	22.28	20.87	20.08	16.93		8.46								0.61	1.28	0.49				0.51			0.6			M6	(73)	
250/200	(590)	(566)	(530)	(510)	(430)		(215)								(15.5)	(32.5)	(12.5)				(13)			(15)			and	229	3
300/250											39.37	38.19	36.81	37.20				2.15	8.46	38.19					14.17	8.66	M12	(104)	
350/300	29.13	28.19	26.77	25.98	22.83	11.42		2.95			(1000)	(970)	(935)	(945)				(54.5)	(215)	(970)					(360)	(220)		317	
400/350	(740)	(716)	(680)	(660)	(580)	(290)	-	(75)																				(144)	5
450/350																													
500/400	29.13	28.19	26.77	25.98	22.83	11.42	2.95	4.55	2.60																		M8	551	6
600/450	(740)	(716)	(680)	(660)	(580)	(290)	(75)	(115.5	(66)		55.12	53.94	52.36	52.76	0.61	1.38	0.57	0.18	6.99	8.46	5.71	54.37	0.81	0.59	17.72	11.22	and	(250)	
700/500	37.01	36.06	34.65	33.86	30.71	10.24	4.72	2.76	2.56	4.33	(1400)	(1370)	(1330)	(1340)	(15.5)	(35)	(14.5)	(4.5)	(177.5)	(215)	(145)	(1381)	(20.5)	(15)	(450)	(285)	M12	793	7
800/600	(940)	(916)	(880)	(860)	(780)	(260)	(120)	(70)	(65)	(110)																		(360)	

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Electromagnetic Compatibility (EMC)

1. General

In accordance with the provisions described in the European Commission Guidelines Document on Council Directive 89/336/EEC, these drives are classified as “Complex Components”.

Classification as a “Complex Components” allows a product to be treated as an “apparatus”, and thus permits compliance with the essential requirements of the EMC Directive to be demonstrated to both an integrator of GP10 drives and to his customer or the installer and the user.

GP10 drive is supplied ‘CE-marked’, signifying compliance with EC Directive 89/336/EEC when fitted with specified filter units installed and earthed in accordance with this sheet.

This Specification requires the following performance criteria to be met.

EMC product standard EN61800-/13/1997

Immunity: Second environment (Industrial environment)
Emision: First environment (Domestic environment)

Finally, it is the customer's responsibility to check whether the equipment conforms to EMC directive.

2. Recommended Installation Instructions

It is necessary that to conform to the EMC Directive, these instructions must be followed.

Follow the usual safety procedures when working with electrical equipment. All electrical connections to the filter, Drive and motor must be made by a qualified electrical technician.

1) Use the correct filter according to Table on page 6-39.
2) Install the Drive and filter in the electrically shielded metal wiring cabinet.
3) The back panel of the wiring cabinet should be prepared for the mounting dimensions of the filter. Care should be taken to remove any paint etc. from the mounting holes and face area of the panel. This will ensure the best possible grounding of the filter.
4) Use the shield cable for the control , motor and other main wiring which are connected to the Drive. These shields should be securely grounded.
5) It is important that all wire lengths are kept as short as possible and that incoming mains and outgoing motor cables are kept well separated.

“ To minimize the conducted radio disturbance in the power distribution systems, the length of the motor-cable should be as short as possible. “

6) In the case where a ferrite ring is provided with the filter, fit the ferrite ring so the conductors pass through the center of the ferrite. Wire the cable according to Fig.6 or Fig.7 , paying attention to the applied Drive type.

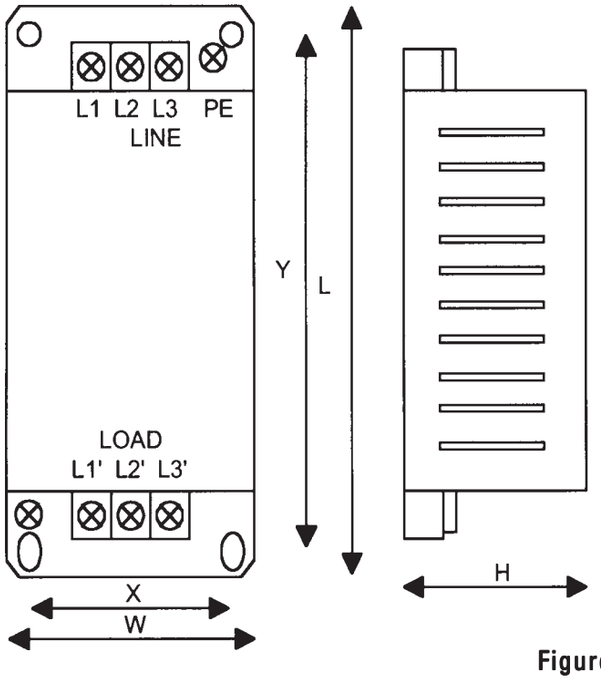
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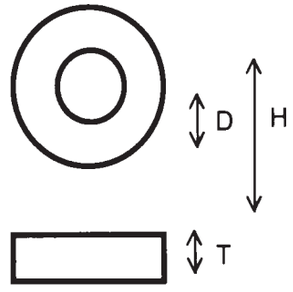
Applied Drive GP10

[Hp] Max. rated voltage 3 Phase 230 VAC

G11	Filter Type (Fuji model #)	Rated Current	Tested Motor Cable Length		RFI Filter Data					Note
			EN55011 Class B	EN55011 Class A	Dimensions L x W x H (mm)	Mount. Dim. Y x X (mm)	Ferrite Ring (Qty)	Total Wt. (lb)	Watt loss [W]	
0.25 0.5 1	EFL075SP2 (EFL-0.75SP-2)	6A			9.57 x3.35x3.66 (243x85x93)	8.98x2.32 (228x59)	OF1 [1]	3.3	0.4 1.4 5.1	
2 3 5	EFL370SP2 (EFL-3.7SP-2)	25A		164 ft (50m)	9.17x4.13x5.35 (233x105x136)	8.46x 3.15 (215x80)	OF2 [1]	5.5	3.9 8.2 21	Fig. 1 Separate Type
7.5 10	EFL750SP2 (EFL-7.5SP-2)	50A	—		10.75x4.72x6.22 (273x120x158)	10x3.74 (254x95)	OF2 [1]	11.0	24 40	
15 20	EFL150SP2 (EFL-15SP-2)	100A			20.2x8.07x7.6 (513x205x193)	19.17x6.30 (487x160)	OF3 [1]	44.1	42 68	
25 30	EFL220SP2 (EFL-22SP-2)	150A							74 99	
40	RF3180F11 (RF3180-F11)	180A			19.49x7.87x6.3 (495x200x160)	18.4x6.53 (468x166)	—	48.7	60	Fig. 3 Separate Type
50 60	RF3280F11 (RF3280-F11)	280A			23.11x9.84x8.07 (587x250x205)	22.05x3.35 (560x85)	—	48.7	120	
75 100 125 150	RF3400F11 (RF3400-F11)	400A	—	328 Ft (100m)			—	110	220	Fig. 4 Separate Type
[HP] Max. rated voltage 3 Phase 480 VAC										
0.5 1	EFL075G114 (EFL-0.75G11-4)	5A			12.6x4.56x1.65 (320x116x42)	11.54x3.54 (293x90)	—	2.0	0.8 3.1	
2 3 5	EFL400G114 (EFL-4.0G11-4)	12A			12.6x6.1x1.77 (320x155x45)	11.54x4.13 (293x105)	—	2.6	3.1 6.9 18	Fig. 2 Separate/ Integral Type
7.5 10	EFL750G114 (EFL-7.5G11-4)	35A	33 ft (10m)	164 ft (50m)	13.43x8.86x1.87 (341x225x47.5)	12.24x6.57 (311x167)	—	4.0	10 17 24	
15 20	EFL150G114 (EFL-15G11-4)	50A			19.69x9.84x2.76 (500x250x70)	17.68x7.28 (449x185)	—	7.9	29 49	
25 30	EFL220G114 (EFL-22G11-4)	72A					—	8.8	47 62	
40	RF3100F11 (RF3100-F11)	100A			17.13x7.87x5.19 (435x200x130)	16.06x6.54 (408x166)	—	28.6	21	
50 60 75 100 125	RF3180F11 (RF3180-F11)	180A			19.49x7.87x6.3 (495x200x160)	18.4x6.53 (468x166)	—	48.7	60	Fig. 3 Separate Type
150 200	RF3280F11 (RF3280-F11)	280A	—	328 ft (100m)	23.11x9.84x8.07 (587x250x205)	22.05x3.35 (560x85)	—	84.8	120	Fig. 4 Separate Type
250 300 350	RF3400F11 (RF3400-F11)	400A					—	110	220	
400 450	RF3880F11 (RF3880-F11)	800A			27.09x14.33x7.09 (688x364x180)	25.51x5.91 (648x150)	—	130	180	Fig. 5 Separate Type
500 600 700 800							F200 160 [3]	142	180	

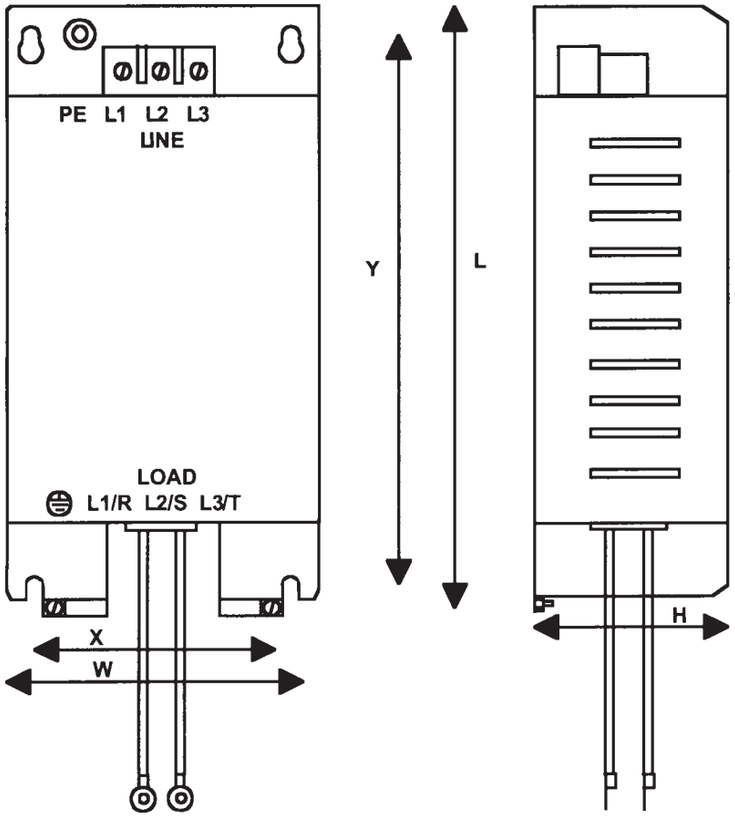
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Ferrite Ring Dimensions : Inches (mm)			
Part No.	D	H	T
OF1	0.98 (25)	2.01 (51)	0.67 (17)
OF2	1.61 (41)	2.80 (71)	0.71 (18)
OF3	2.83 (72)	3.94 (100)	1.06 (27)

Figure 1



3 power cables
1 grounding cable

Figure 2

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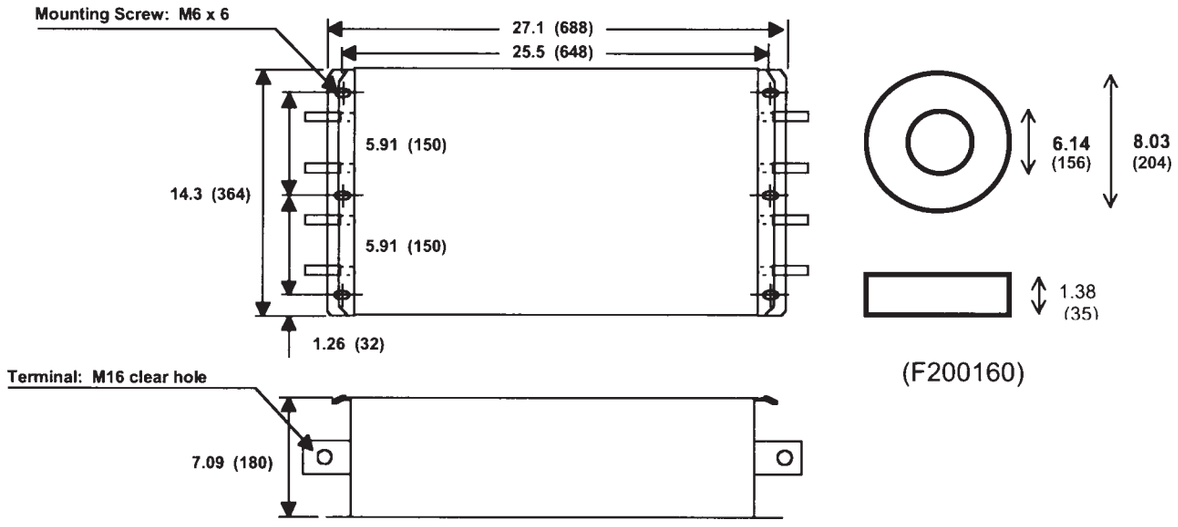


Figure 5 Outline Dimensions (RF3880-F11)

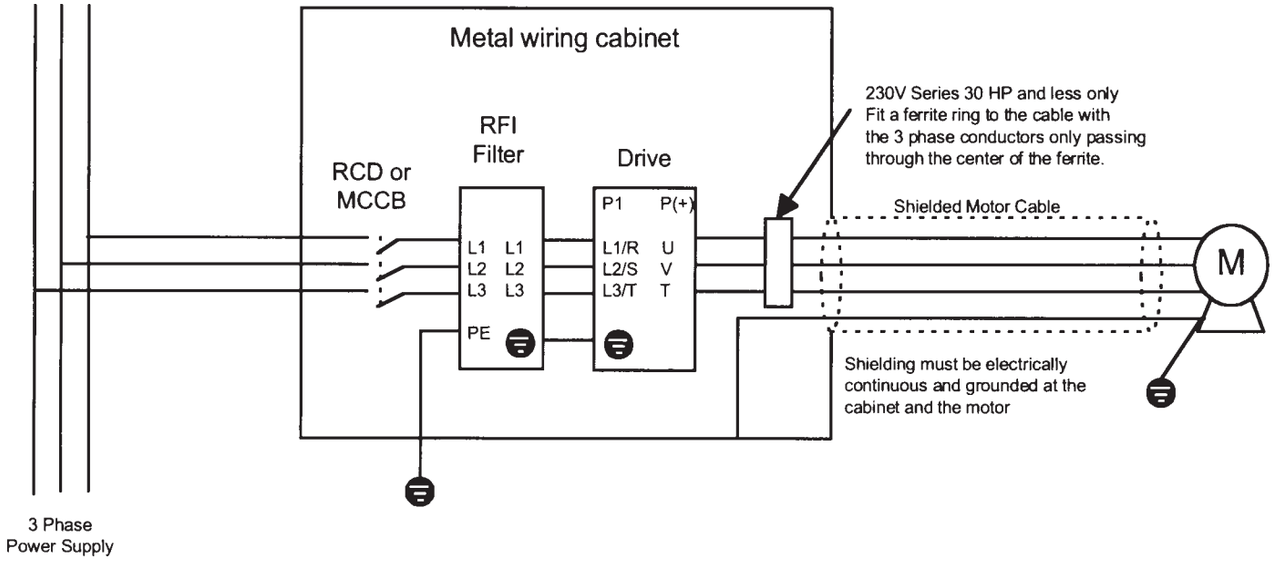


Figure 6 230V all Hp
460V less than 350 Hp

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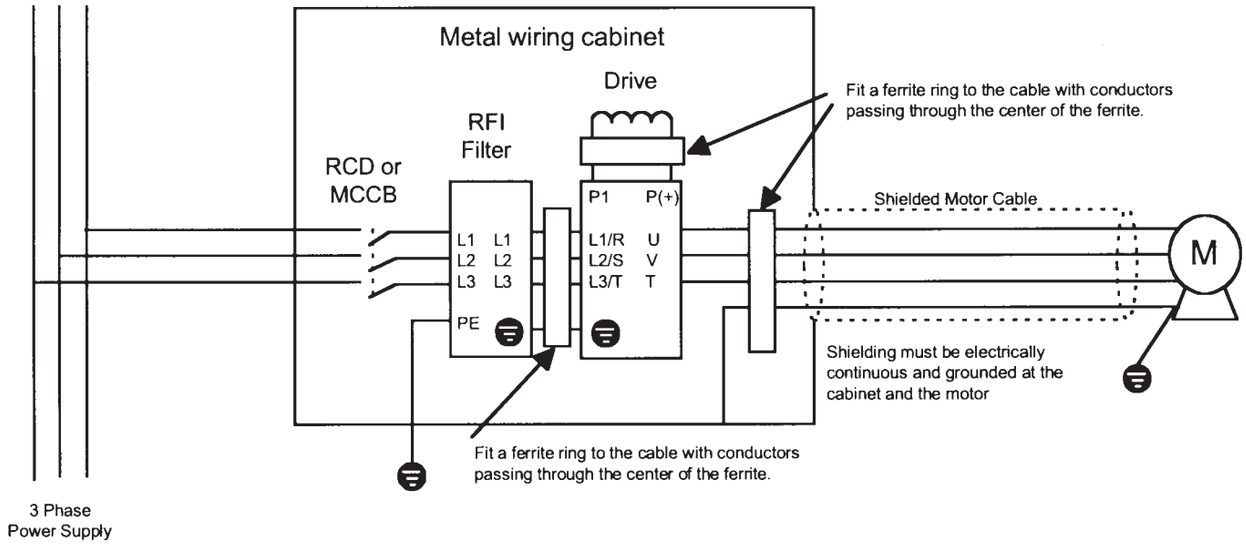


Figure 7 GP10 460V 400 Hp and higher

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