

1336 PLUS II Selection Guide



Catalog Number Explanation

1336F	A007	AA	EN	LA6	HAS1	GM1
BULLETIN NO.	VOLTAGE/RATING	ENCLOSURE (MUST BE SPECIFIED)	LANGUAGE (MUST BE SPECIFIED) ¹	CONTROL INTERFACE (OPTIONAL) ²	HUMAN INTERFACE (OPTIONAL) ²	COMMUNICATION CARD (OPTIONAL) ²

¹ A Language Module must be specified with each drive.

² At least one of either a Control Interface, Human Interface or Communication Card Option will be required to make the drive functional. The chosen option(s) may be ordered factory installed or as add-on kits.

1336 PLUS II Selection Guide

Constant/Variable Torque Drives and Enclosures

200-240V

Drive Rating ¹ Constant Torque				Open IP00	NEMA Type 1 IP20	NEMA Type 4 IP65	NEMA Type 12 IP54
Amps	kW	CT HP	VT HP ²	No Enclosure	General Purpose	Resist Water, Dust	Industrial Use
2.3	0.37	0.5	0.5	AQF05 – AN	AQF05 – AA	AQF05 – AF	AQF05 – AJ
3.0	0.56	0.75	0.75	AQF07 – AN	AQF07 – AA	AQF07 – AF	AQF07 – AJ
4.5	0.75	1	1	AQF10 – AN	AQF10 – AA	AQF10 – AF	AQF10 – AJ
6.0	1.2	1.5	1.5	AQF15 – AN	AQF15 – AA	AQF15 – AF	AQF15 – AJ
8.0	1.5	2	2	AQF20 – AN	AQF20 – AA	AQF20 – AF	AQF20 – AJ
12	2.2	3	3	AQF30 – AN	AQF30 – AA	AQF30 – AF	AQF30 – AJ
18	4.0	5	5	AQF50 – AN	AQF50 – AA	AQF50 – AF	AQF50 – AJ
22	5.5	7.5	7.5	AQF75 – AN	AQF75 – AA	AQF75 – AF	AQF75 – AJ
22	5.5	7.5	7.5	A007 – AN	A007 – AA	A007 – AF	A007 – AJ
34	7.5	10	10	A010 – AN	A010 – AA	A010 – AF	A010 – AJ
48	11	15	15	A015 – AN	A015 – AA	A015 – AF	A015 – AJ
65	15	20	20	A020 – AN	A020 – AA	A020 – AF	A020 – AJ
77	18.5	25	25	A025 – AN	A025 – AA	A025 – AF	A025 – AJ
80	22	30	30	A030 – AN	A030 – AA	A030 – AF	A030 – AJ
120	30	40	40	A040 – AN	A040 – AA	3	3
150	37	50	50	A050 – AN	A050 – AA	3	3
180	45	60	60	A060 – AN	A060 – AA	3	3
240	56	75	75	A075 – AN	A075 – AA ⁹	3	3
291	75	100	100	A100 – AN	A100 – AA ⁹	3	3
325	93	125	125	A125 – AN	A125 – AA ⁹	3	3

380-480V

Drive Rating ¹ Constant Torque				Drive Rating ¹ Variable Torque				Open IP00	NEMA Type 1 IP20	NEMA Type 1 IP20	NEMA Type 4 IP65	NEMA Type 12 IP54
Amps	HP	Amps	HP ²	Amps	kW	Amps	kW	No Enclosure	General Purpose	CE/C-tick Conformance	Resist Water, Dust	Industrial Use
1.1	0.5	1.2	0.5	1.1	0.37	1.2	0.37	BRF05 – AN	BRF05 – AA	BRF05 – AE	BRF05 – AF	BRF05 – AJ
1.6	0.75	1.7	0.75	1.6	0.56	1.7	0.56	BRF07 – AN	BRF07 – AA	BRF07 – AE	BRF07 – AF	BRF07 – AJ
2.1	1	2.3	1	2.1	0.75	2.3	0.75	BRF10 – AN	BRF10 – AA	BRF10 – AE	BRF10 – AF	BRF10 – AJ
2.8	1.5	3.0	1.5	2.8	1.2	3.0	1.2	BRF15 – AN	BRF15 – AA	BRF15 – AE	BRF15 – AF	BRF15 – AJ
3.8	2	4.0	2	3.8	1.5	4.0	1.5	BRF20 – AN	BRF20 – AA	BRF20 – AE	BRF20 – AF	BRF20 – AJ
5.3	3	6.0	3	5.3	2.2	6.0	2.2	BRF30 – AN	BRF30 – AA	BRF30 – AE	BRF30 – AF	BRF30 – AJ
8.4	5	9.0	5	8.4	3.7	9.0	3.7	BRF50 – AN	BRF50 – AA	BRF50 – AE	BRF50 – AF	BRF50 – AJ
13.3	7.5	15.4	10	13.3	5.5	15.4	5.5	BRF75 – AN	BRF75 – AA	BRF75 – AE	BRF75 – AF	BRF75 – AJ
16.1	10	22.0	15	16.1	7.5	22.0	11	BRF100 – AN	BRF100 – AA	BRF100 – AE	BRF100 – AF	BRF100 – AJ
24.0	15	24.0	15	24.0	11	24.0	11	BRF150 – AN	BRF150 – AA	BRF150 – AE	BRF150 – AF	BRF150 – AJ
27.0	20	27.0	20	27.0	15	27.0	15	BRF200 – AN	BRF200 – AA	BRF200 – AE	BRF200 – AF	BRF200 – AJ
24.2	15	27	20	24.2	11	27	15	B015 – AN	B015 – AA	B015 – AE	B015 – AF	B015 – AJ
31	20	34	25	31	15	34	18.5	B020 – AN	B020 – AA	B020 – AE	B020 – AF	B020 – AJ
39	25	42	30	39	18.5	42	22	B025 – AN	B025 – AA	B025 – AE	B025 – AF	B025 – AJ
45	30	48	30	45	22	48	22	B030 – AN	B030 – AA	B030 – AE	B030 – AF	B030 – AJ
59	40	59	40	59	30	59	30	BX040 – AN	BX040 – AA	BX040 – AE	BX040 – AF	BX040 – AJ
60	40	65	50	60	30	65	37	B040 – AN	B040 – AA	B040 – AE	B040 – AF	B040 – AJ
75	50	75	60	75	37	75	45	B050 – AN	B050 – AA	B050 – AE	B050 – AF	B050 – AJ
77	60	77	60	77	45	77	45	BX060 – AN ⁴	BX060 – AA ⁴	BX060 – AE ⁴	BX060 – AF ⁴	BX060 – AJ ⁴
85	60	96	75	85	45	96	56	B060 – AN	B060 – AA	B060 – AE	3	3
106	75	120	100	106	56	120	75	B075 – AN	B075 – AA	B075 – AE	3	3
138	100	150	125	138	75	150	93	B100 – AN	B100 – AA	B100 – AE	3	3
173	125	180	150	173	93	180	112	B125 – AN	B125 – AA	B125 – AE	3	3
180	150	180	150	180	112	180	112	BX150 – AN	BX150 – AA	BX150 – AE	3	3
199	150	240	200	199	112	240	149	B150 – AN	B150 – AA ⁹	B150 – AE ⁹	3	3
263	200	292	250	263	149	292	187	B200 – AN	B200 – AA ⁹	B200 – AE ⁹	3	3
325	250	325	250	325	187	325	187	B250 – AN	B250 – AA ⁹	B250 – AE ⁹	3	3
325	250	360	300	325	187	360	224	BP250 – AN ⁷	BP250 – AA ^{7,9}	–	3	3
								BPR250 – AN ⁷	–	BPR250A – AE ^{7,8,9}		
325	250	360	300	325	187	360	224	BX250 – AN	BX250A – AA ⁹	BX250A – AE ^{8,9}	3	3
360	300	425	350	360	224	425	261	B300 – AN	B300A – AA ⁹	B300A – AE ^{8,9}	3	3
360	300	425	350	360	224	425	261	BP300 – AN ⁷	BP300 – AA ^{7,9}	–	3	3
								BPR300 – AN ⁷	–	BPR300A – AE ^{7,8,9}		
425	350	475	400	425	261	475	298	B350 – AN	B350A – AA ⁹	B350A – AE ^{8,9}	3	3
425	350	475	400	425	261	475	298	BP350 – AN ⁷	BP350 – AA ^{7,9}	–	3	3
								BPR350 – AN ⁷	–	BPR350A – AE ^{7,8,9}		
475	400	525	450	475	298	525	336	B400 – AN	B400A – AA ⁹	B400A – AE ^{8,9}	3	3
475	400	532	450	475	298	532	336	BP400 – AN ⁷	BP400 – AA ^{7,9}	–	3	3
								BPR400 – AN ⁷	–	BPR400A – AE ^{7,8,9}		
525	450	590	500	525	336	590	373	B450 – AN	B450A – AA ⁹	B450A – AE ^{8,9}	3	3
532	450	532	450	532	336	532	336	BP450 – AN ⁷	BP450 – AA ^{7,9}	–	3	3
								BPR450 – AN ⁷	–	BPR450A – AE ^{7,8,9}		
590	500	670	600	590	373	670	448	B500 – AN	B500A – AA ⁹	B500A – AE ^{8,9}	3	3
670	600	670	600	670	448	670	448	B600 – AN	B600A – AA ⁹	B600A – AE ^{8,9}	3	3

Constant/Variable Torque Drives and Enclosures

500-600V

Drive Rating ¹				Open IP00	NEMA Type 1 IP20	NEMA Type 4 IP65	NEMA Type 12 IP54
Amps	kW	CT HP	VT HP	No Enclosure	General Purpose	Resist Water, Dust	Industrial Use
2.0	0.75	1	1	CWF10 – AN	CWF10 – AA	CWF10 – AF	CWF10 – AJ
4.0	1.5	2	2	CWF20 – AN	CWF20 – AA	CWF20 – AF	CWF20 – AJ
6.0	2.2	3	3	CWF30 – AN	CWF30 – AA	CWF30 – AF	CWF30 – AJ
8.0	3.7	5	5	CWF50 – AN	CWF50 – AA	CWF50 – AF	CWF50 – AJ
10	5.5	7.5	7.5	CWF75 – AN	CWF75 – AA	CWF75 – AF	CWF75 – AJ
12	7.5	10	10	CWF100 – AN	CWF100 – AA	CWF100 – AF	CWF100 – AJ
19	11	15	15	CWF150 – AN	CWF150 – AA	CWF150 – AF	CWF150 – AJ
24	15	20	20	CWF200 – AN	CWF200 – AA	CWF200 – AF	CWF200 – AJ
30	18.5	25	25	C025 – AN	C025 – AA	C025 – AF	C025 – AJ
35	22	30	30	C030 – AN	C030 – AA	C030 – AF	C030 – AJ
45	30	40	40	C040 – AN	C040 – AA	C040 – AF	C040 – AJ
57	37	50	50	C050 – AN	C050 – AA	C050 – AF	C050 – AJ
62	45	60	60	C060 – AN	C060 – AA	C060 – AF	C060 – AJ
85	56	75	75	C075 – AN	C075 – AA	3	3
109	75	100	100	C100 – AN	C100 – AA	3	3
138	93	125	125	C125 – AN	C125 – AA	3	3
158	112	150	150	C150 – AN	C150 – AA ⁹	3	3
252	149	200	200	C200 – AN	C200 – AA ⁹	3	3
284	187	250	250	C250 – AN	C250 – AA ⁹	3	3
300	224	300	300	CX300 – AN	CX300 – AA ⁹	3	3
350	261	350	350	CP350 – AN ⁷	CP350 – AA ^{7, 9}	3	3
				CPR350 – AN ⁷	–	3	3
400	298	400	400	CP400 – AN ⁷	CP400 – AA ^{7, 9}	3	3
				CPR400 – AN ⁷	–	3	3
300	224	300	300	C300 – AN	C300A – AA ⁹	3	3
350	261	350	350	C350 – AN	C350A – AA ⁹	3	3
400	298	400	400	C400 – AN	C400A – AA ⁹	3	3
450	336	450	450	C450 – AN	C450A – AA ⁹	3	3
500	373	500	500	C500 – AN	C500A – AA ⁹	3	3
600	448	600	600	C600 – AN	C600A – AA ⁹	3	3

Language Group

Description	Used With . . .	Option Code
Language ⁵	All Drives	
English		-EN
French		-FR
German		-DE
Italian		-IT
Japanese		-JP
Spanish		-ES

Dynamic Brake Kits

Description	Used With . . .	Catalog Number Complete Brake	Catalog Number Brake Chopper
for 200-240V AC Drives	0.37-3.7 kW (0.5-5 HP) ⁶	-KA005	-WA018
	5.5-7.5 kW (7.5-10 HP) ⁶	-KA010	-WA018
	11-22 kW (15-30 HP) ⁶	NA	-WA070
	30-56 kW (40-75 HP) ⁶	NA	-WA115
for 380-480V AC Drives	0.37-3.7 kW (0.5-5 HP) ⁶	-KB005	-WB009
	5.5-7.5 kW (7.5-10 HP) ⁶	-KB010	-WB009
	11-37 kW (15-50 HP) ⁶	-KB050	-WB035
	45-149 kW (60-200 HP) ⁶	NA	-WB110
for 500-600V AC Drives	0.37-3.7 kW (0.5-5 HP) ⁶	-KC005	-WC009
	5.5-7.5 kW (7.5-10 HP) ⁶	-KC010	-WC009
	11-30 kW (15-40 HP) ⁶	-KC050	-WC035
	37-149 kW (50-200 HP) ⁶	NA	-WC085

¹ Drive rating is based on nominal voltage and carrier frequency at altitudes of 1000 meters or less. Refer to the Derating Guidelines on Pages 57-61.

² VT /HP ratings are valid for 240V or 480V only.

³ Not available in this rating.

⁴ 480 Volts only.

⁵ A Language Group must be specified with each drive for User Manual.

⁶ Multiple kits may be utilized together to obtain higher ratings. Refer to the appropriate brake publication (1336-5.64 or 5.65) for further information.

⁷ A "Common Mode Choke" option (-CM) or "No Common Mode Choke" option (-NCM) must be specified with each F Frame Drive.

⁸ These units include as standard an integral EMC filter.

⁹ This drive will not accept a "Snap-In" HIM (HASP, HAS1, HAS2, HCSP, HCS1, HCS2).

1336 PLUS II Selection Guide

Factory Installed Options

Description	Used With . . .	Option Code (Installed)
Communication Options Single Point RIO RS232/422/485, DF1 & DH485 Protocol DeviceNet Enhanced DeviceNet	Frames B & Up (Adapter 6 Only)	-GM1 ³ -GM2 ³ -GM5 ³ -GM6 ³
Communication Options Single Point RIO with Snap-In Cradle RS232/422/485, DF1 & DH485 Protocol w/Snap-In Cradle DeviceNet Enhanced DeviceNet Snap-In Cradle/Blank Plate	All Frames (Adapter 1 Only)	-GMS1 ³ -GMS2 ³ -GMS5 ³ -GMS6 ³ -HASB ³
Control Interface Contact Closure +24V AC/DC 115V AC	All Drives	-L4 -L5 -L6
Control Interface with Encoder Feedback Contact Closure +24V AC/DC 115V AC	All Drives	-L4E -L5E -L6E
Control Interface with Encoder Feedback ⁵ Contact Closure +24V AC/DC 115V AC	All Drives	-L7E -L8E -L9E
Analog Interface – Port A (Choose One) Two Isolated Configurable Inputs One Isolated Bi-Polar Input (±10V) and One Isolated Thermistor Input One Isolated Bi-polar Input (±10V) and One Isolated Configurable Input	All Drives	-LA2 -LA6 -LA7
Analog Interface – Port B (Choose One) Single-ended, Non-isolated Input Configurable or Pot & 2 Single-ended, Non-isolated 0-20mA Outputs Two Isolated Configurable Outputs One Isolated Configurable Input & Output One Isolated Pulse Input & Non-isolated Output and One Single-ended, Non-isolated 0-10V Output	All Drives	-LA1 -LA3 -LA4 -LA5
Human Interface Module, Snap-In IP20 (NEMA Type 1) Snap-In Cradle/Blank Plate Programmer Only Programmer Only & Upload/Download Capability Programmer/Controller with Analog Pot Programmer/Controller with Analog Pot & Upload/Download Capability Programmer/Controller with Digital Pot Programmer/Controller with Digital Pot & Upload/Download Capability	IP00 (Open) A-G Frame & IP20 (NEMA Type 1) A-D Frame Drives	-HASB -HASP -HCSP -HAS1 -HCS1 -HAS2 -HCS2
Human Interface Module, IP20 (NEMA Type 1) Programmer Only Programmer/Controller with Analog Pot Programmer/Controller with Digital Pot	IP20 (NEMA Type 1) E-G Frame Enclosures	-HAP ² -HA1 ² -HA2 ²
Human Interface Module, IP66 ¹ Programmer/Display Only Programmer/Controller with Digital Pot	IP66 or IP54 (NEMA Type 12) Drives	-HJP -HJ2

¹ This option may be used on an IP65 or IP66 rated enclosure to meet watertight indoor applications.

² Requires a Communication Option Cable (1202-Cxx) to be functional.

³ A maximum of one Communication Option may be ordered factory installed on A Frame drives (2 for B Frame drives and up, limited to 1-Snap-in and 1-Main Control Board mount).

⁴ Each Flex I/O SCANport Module requires (1) 1203-FB1 and (1) 1203-FM1.

⁵ The encoder loss detection feature of the 1336 PLUS II requires the use of L7E, L8E or L9E.

Field Installed Options

Description	Used With . . .	Catalog No. (Loose Kit)
Remote Mounted w/Integral 115V AC Power Supply Single Point RIO RS 232/422/485, DF1, DH485	All Drives	1203-GD1 ² 1203-GD2 ²
Remote Mounted for use with 24V DC Power Supply Single Point RIO RS232/422/485, DF1, DH485 DeviceNet Enhanced DeviceNet	All Drives	1203-GK1 ² 1203-GK2 ² 1203-GK5 ² 1203-GU6 ²
Drive Mounted and Drive Powered (with loose snap-in cradle/blank plate) Single Point RIO RS232/422/485, DF1, DH485 Protocol DeviceNet Enhanced DeviceNet	A Frame Drives – Adapter 1 w/Snap-in Cradle/Blank Plate B Frame & Up – Adapter 6 (or Adapter 1 w/Snap-in Cradle/Blank Plate)	1336-GM1 ³ 1336-GM2 ³ 1336-GM5 ³ 1336-GM6 ^{3,5}
Firmware Download Module Module allows firmware upgrade	All Drives	1336F-FDM
ControlNet™ to SCANport Adapter Remote Mounted (DIN Rail) - 24V DC Requires 24V DC power supply	All Drives	1203-CN1 ^{3,5}
Smart Serial to SCANport Adapter Includes 1203-SFC & 1202-C10 Cables	All Drives	1203-SSS
SCANport Expander Module One to Two One to Four	All Drives	1203-SG2 1203-SG4
Flex I/O SCANport Module ⁴ Flex I/O Terminal Base Flex I/O Module	All Drives	1336-FB1 1336-FM1
HIM, Snap-In, IP20 (NEMA Type 1) Snap-In Cradle/Blank Plate Programmer Only Programmer Only & Upload/Download Capability Programmer/Controller with Analog Pot Programmer/Controller with Analog Pot & Upload/Download Capability Programmer/Controller with Digital Pot Programmer/Controller with Digital Pot & Upload/Download Capability	IP00 (Open) A-G Frame & IP20 (NEMA Type 1) A-D Frame Drives	1201-HASB 1201-HASP 1201-HCSP 1201-HAS1 1201-HCS1 1201-HAS2 1201-HCS2
HIM, Hand-Held, IP20 (NEMA Type 1) Requires Cable Below Programmer Only Programmer/Controller w/Analog Speed Pot Programmer/Controller w/Digital Speed Pot	IP20 (NEMA Type 1) E-G Frame Enclosures	1201-HAP 1201-HA1 1201-HA2
HIM IP66 (NEMA Type 12/UL Type 4X-Indoor) Programmer Only Programmer/Controller w/Digital Speed Pot	IP66 (NEMA Type 12/UL Type 4X Indoor) Enclosures	1201-HJP ² 1201-HJ2 ²
Option Cable Kit - Connect to Comm. Port 0.33 Meters (1.1 Feet) 1 Meter (3.3 Feet) 3 Meter (9.8 Feet) 9 Meter (29.5 Feet)	All HIMs not mounted on the drive chassis	1202-C03 1202-C10 1202-C30 1202-C90
Door Mount Bezel Kit, IP20 (NEMA Type 1)	User Supplied IP20 (NEMA Type 1) Enclosures and HIM	1201-DMA

¹ This option may be used on an IP65 or IP66 rated enclosure to meet watertight indoor applications.

² Requires a Communication Option Cable (1202-Cxx) to be functional.

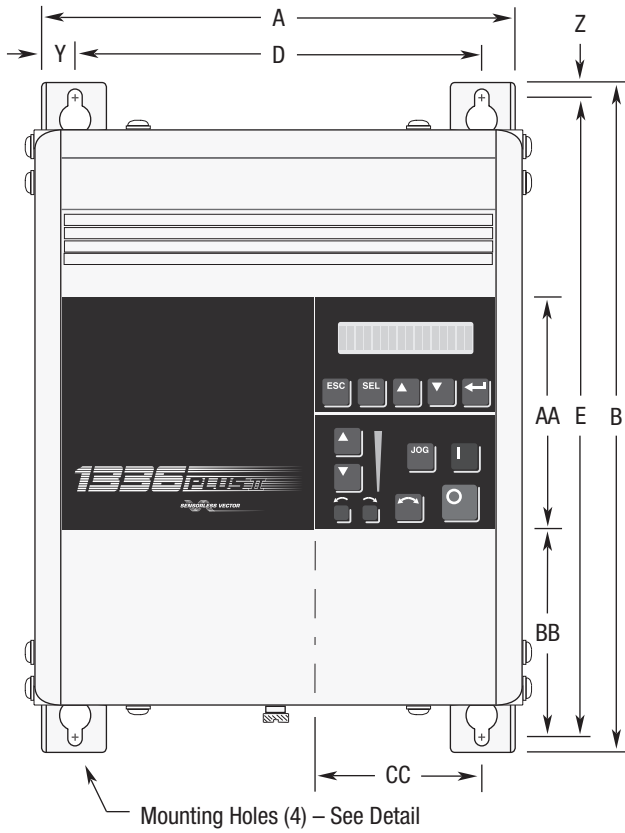
³ A maximum of one Communication Option may be drive mounted.

⁴ Each Flex I/O SCANport Module requires (1) 1203-FB1 and (1) 1203-FM1.

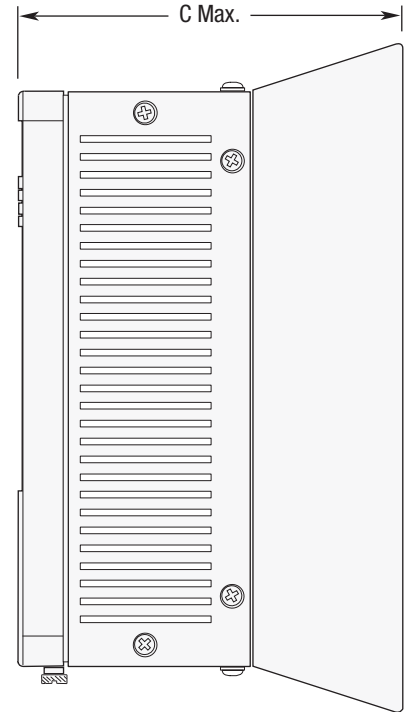
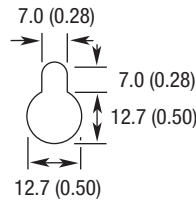
⁵ Adapter is programmed/configured with Windows™ HyperTerminal via RS-232 using the 1203-SFC cable (purchased separately), or using a compatible network specific software tool.

Pre-Installation

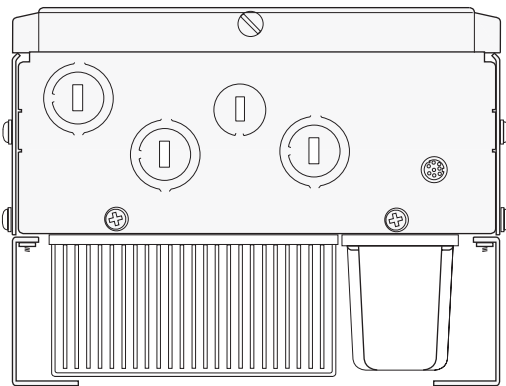
IP 20 (NEMA Type 1) Dimensions – Frames A1 Through A4



Mounting Hole Detail



Bottom View Will Vary with HP – See Bottom View Dimensions



Three-Phase Rating ^{1,2}			Frame Reference
200-240V	380-480V	500-600V	
0.37-0.75 kW 0.5-1 HP	0.37-1.2 kW 0.5-1.5 HP	–	A1
1.2-1.5 kW 1.5-2 HP	1.5-2.2 kW 2-3 HP	–	A2
2.2-3.7 kW 3-5 HP	3.7 kW 5 HP	–	A3
–	5.5-15 kW * 7.5-20 HP	0.75-15 kW 1-20 HP	A4
5.5-11 kW 7.5-15 HP	11-22 kW * 15-30 HP	–	B1/B2
15-22 kW 20-30 HP	30-45 kW 40-60 HP	18.5-45 kW 25-60 HP	C
30-45 kW 40-60 HP	45-112 kW 60-150 HP	56-93 kW 75-125 HP	D
56-93 kW 75-125 HP	112-187 kW 150-250 HP	112-187 kW 150-300 HP	E
–	187-336 kW 250-450 HP	261-298 kW 350-400 HP	F
–	187-448 kW 250-600 HP	224-448 kW 300-600 HP	G

All Dimensions in Millimeters and (Inches)
All Weights in Kilograms and (Pounds)

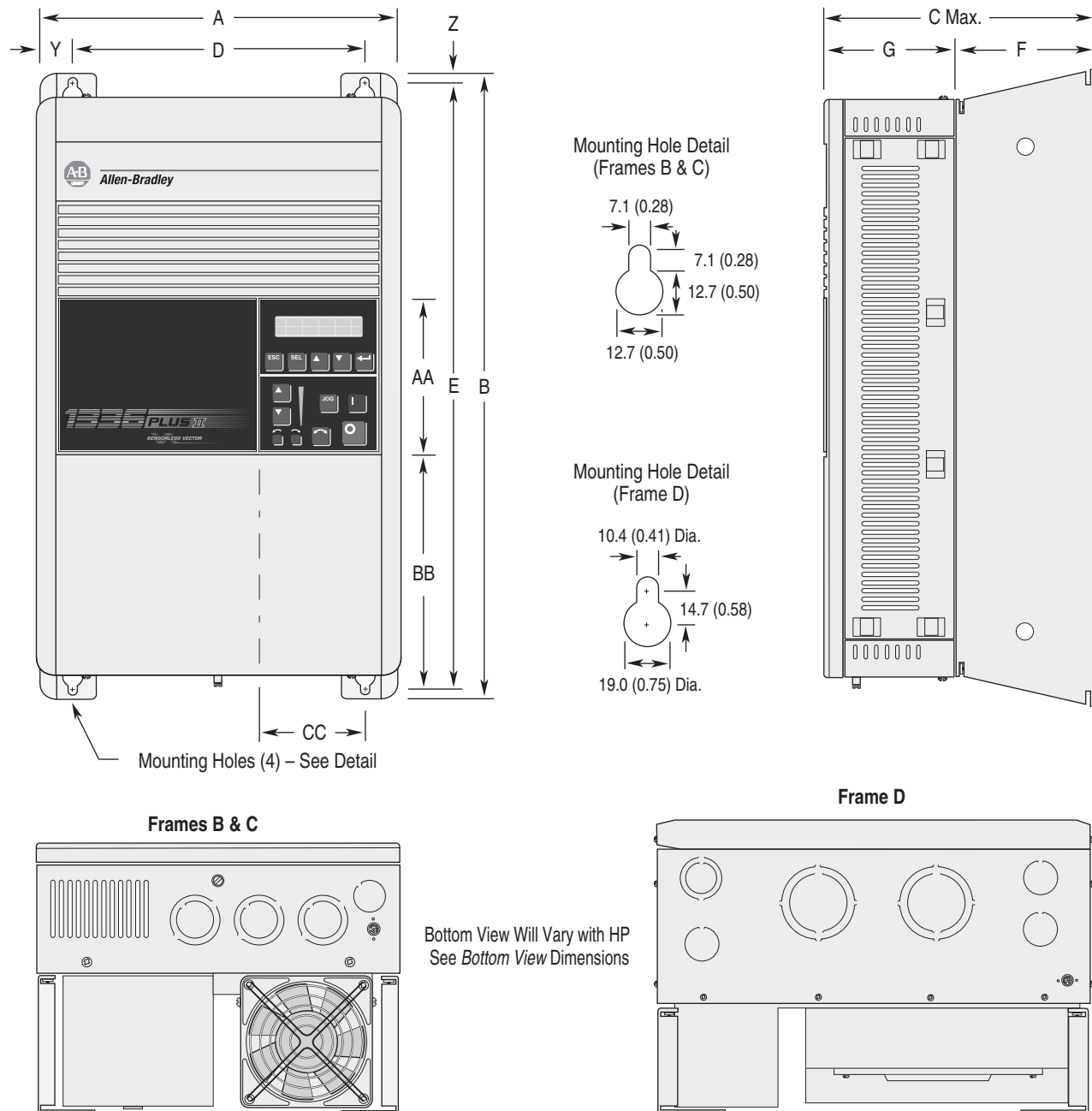
* Use care when choosing Frame Reference - Some ratings may exist in another frame size.

Frame Reference	A	B	C Max.	D	E	Y	Z	AA	BB	CC	Shipping Weights
A1	215.9 (8.50)	290.0 (11.42)	160.0 (6.30)	185.2 (7.29)	275.0 (10.83)	15.35 (0.60)	7.5 (0.30)	130.0 (5.12)	76.2 (3.00)	85.3 (3.36)	4.31 (9.5)
A2	215.9 (8.50)	290.0 (11.42)	180.5 (7.10)	185.2 (7.29)	275.0 (10.83)	15.35 (0.60)	7.5 (0.30)	130.0 (5.12)	76.2 (3.00)	85.3 (3.36)	5.49 (12.1)
A3	215.9 (8.50)	290.0 (11.42)	207.0 (8.15)	185.2 (7.29)	275.0 (10.83)	15.35 (0.60)	7.5 (0.30)	130.0 (5.12)	76.2 (3.00)	85.3 (3.36)	6.71 (14.8)
A4	260.0 (10.24)	350.0 (13.78)	212.0 (8.35)	230.0 (9.06)	320.0 (12.60)	15.35 (0.60)	15.35 (0.60)	130.0 (5.12)	133.0 (5.23)	86.0 (3.39)	15.90 (35.0)

¹ Refer to the Derating Guidelines on Pages 56-60 for derating information.

² kW/HP are constant torque (CT) ratings.

IP 20 (NEMA Type 1) Dimensions – Frames B, C, D



All Dimensions in Millimeters and (Inches)
All Weights in Kilograms and (Pounds)

Frame Reference	A	B	C Max.	D	E	F	G		Y	Z	AA	BB	CC	Shipping Weight
							Encl.	Open						
B1/B2	276.4 (10.88)	476.3 (18.75)	225.0 (8.86)	212.6 (8.37)	461.0 (18.15)	131.6 (5.18)	93.5 (3.68)	88.9 (3.50)	32.00 (1.26)	7.6 (0.30)	131.1 (5.16)	180.8 (7.12)	71.9 (2.83)	22.7 kg (50 lbs.)
C	301.8 (11.88)	701.0 (27.60)	225.0 (8.86)	238.0 (9.37)	685.8 (27.00)	131.6 (5.18)	93.5 (3.68)	88.9 (3.50)	32.00 (1.26)	7.6 (0.30)	131.1 (5.16)	374.7 (14.75)	71.9 (2.83)	38.6 kg (85 lbs.)
D	381.5 (15.02)	1240.0 (48.82)	270.8 (10.66)	325.9 (12.83)	1216.2 (47.88)	81.3 (3.20)	189.5 (7.46)	184.9 (7.28)	27.94 (1.10)	11.94 (0.47)	131.1 (5.16)	688.6 (27.11)	83.6 (3.29)	108.9 kg (240 lbs.)

Product Description

Features


Protective

- Detection and Trip:
 - Undervoltage*
 - Overvoltage*
 - Drive Overcurrent*
 - Overtemperature*
 - External Signal*
 - Drive Output Short*
 - Ground Fault*
 - Encoder Loss*
 - At temperature*
 - Load Loss*
 - Single Phase*
- Overcurrent Stall
- Overvoltage Stall
- Six Drive Alarms
- Fault Reset Input

Special Function

- Auto Economizer
- Process PI Controller
- Traverse Function
- Selectable Fault Reset & Run
- Auto Restart on Power Up
- Speed Sensitive Electronic Overload
- Auto-tuning
- Step Logic

Operational

-  Control
- Selectable Volts/Hertz Mode
- Multi-lingual selection

Programmable

- Dual Accel/Decel Profiles
- Three Skip Frequencies
- DC Injection Braking
- Dynamic Braking
- Slip Compensation
- Negative Slip Compensation (Droop)
- S Curve Accel/Decel Profile
- Line Loss Restart Mode
- Proactive Current Limit
- Last Four Event Fault Memory
- Flying Start
- Seven Preset Speeds

I/O Interface

- Control Output Contacts (2) Form A (N.O.) (2) Form C (N.O. - N.C.) Programmable to 17 different drive variables.
- Flexible Analog Inputs/Outputs
- Pulse Train Input
- Encoder Feedback Closed Loop Speed Control
- High Speed Input

Diagnostics

Real time preventive maintenance coupled with customized status and fault reporting.

Depending upon your particular drive configuration, status and fault conditions can be reported through the Human Interface Module or through the SCANport™ Communications Port. Fault diagnostic routines are started each time the 1336 PLUS II is powered up. Throughout the entire run sequence, the drive will continue to look for potential fault conditions.

To allow real-time preventive maintenance, drive output current and control conditions can be selectively monitored while the drive is running. The operator is made aware of alarm conditions such as current limit, bus voltage status, motor overload or drive overload before the drive reaches a fault level. Should a fault occur, plain language diagnostic messages will help identify and isolate the problem, allowing personnel to take quick, corrective action.

Packaging

Small size conserves expensive panel space.

Planer Construction eliminates most internal cables and connectors. Increases reliability.

Laminar Bus Design reduces internal inductance, thereby reducing snubber losses and improving IGBT performance.

Removable Human Interface provides simplicity of programming and flexibility of operation.

Thermal Dissipation Management. Design and extensive infrared testing minimizes hot spots to maximize reliability.

NEMA and European standards. Designed for acceptability throughout the world.

IP 65 & 54 (NEMA Type 4 & 12) configurations accommodated with "heat sink through the back" design.


Electrical

IGBT's (Insulated Gate Bipolar Transistors)

- Quiet motor operation through programmable carrier frequency.
- Third Generation devices – Reduced switching and conduction losses.
- Used on complete line 0.37-448 kW (0.5-600 HP).

Status LEDs. Four status indicators located on the control board.

Dynamic Current Control

- Multiple sensors.
- Exceptional torque production through  Control.
- Proactive current limit control – Reduces trips.
- Ability to start low inductance motors.

Independent Certification. C-UL Listed for dual U.S. and Canadian Certification. Designed to meet EN, IEC, VDE and other international standards.

Isolated Power and Logic eliminates noise to provide reliable and stable operation.

DC Cooling Fan on many ratings eliminates the need for a transformer and voltage tapping; accommodates global usage.


Internal Logic Supply from DC Bus does not require separate control power wiring, improved ride-thru capability.

Communications. Designed to accommodate on-board communications for all ratings.

The 1336 PLUS II

The standard solution to your application needs.

The 1336 PLUS II provides ratings from 0.37-448 kW (0.5-600 HP) in three voltage ranges – 200-240V AC, 380-480V AC and 500-600V AC. The 1336 PLUS II is a micro-processor based adjustable frequency PWM AC drive. Its advanced design provides

exceptional reliability when controlling 3-phase motors. The output can be tuned to provide optimum performance for virtually any load condition. Selectable  or V/Hz operation provides outstanding motor control.

Simplicity

Design and programming simplicity is evident in:

- **Condensed packaging** that allows for easy mounting, installation and wiring in all types of applications.
- **Common assembly parts** that reduces the need to stock a multitude of parts.
- **Easy to program parameters** that are organized in a group and element structure for quick access to related functions.
- **Simple tuning** for optimum torque performance.
- **An easy to read Supertwist Liquid Crystal Display** gives 2 lines of 16 characters each for easy “one finger” programming and drive monitoring.
- **Serial communications** that provide easy integration and access to peripheral equipment – Fully compatible with all Allen-Bradley PLC® or SLC™ equipment.
- **Common options** that are used throughout the entire family of Drives.

Flexibility

Digitally programmable to help provide precise and accurate control.

The 1336 PLUS II uses digitally programmable features to achieve precise and consistently accurate control, setup and operation. The drive can be programmed locally from the Human Interface Module or through a serial communications port using a PLC, SLC, or **DriveTools™** programming software.

Configurable I/O allows simple connection to many customer preformed control schemes.

Control inputs and outputs can be programmed to meet nearly every application requirement.

Performance

Powerful algorithms provide unparalleled performance.




Starting acceleration and running torque in excess of 250% combined with a constant torque speed range of 120:1 allow the 1336 PLUS II to handle the tough applications other drives can't.

Specifications

Protection Specifications

	200-240V Drive	380-480V Drive	500-600V Drive
AC Input Overvoltage Trip	285V AC	570V AC	690V AC
AC Input Undervoltage Trip	138V AC	280V AC	343V AC
Bus Overvoltage Trip	405V DC	810V DC	1013V DC
Bus Undervoltage Trip	200V DC	400V DC	498V DC
Nominal Bus Voltage	324V DC	648V DC	810V DC
Heat Sink Thermistor	Monitored by microprocessor overtemp trip.		
Drive Overcurrent Trip	Software Current Limit: 20 to 160% of VT rated current. Hardware Current Limit: 180 to 250% of VT rated current (dependent on drive rating). Instantaneous Current Limit: 220 to 300% of VT rated current (dependent on drive rating).		
Line transients	Up to 6000 volts peak per IEEE C62.41-1991.		
Control Logic Noise Immunity	Showering arc transients up to 1500 volts peak.		
Power Ride-Thru	15 milliseconds at full load (refer to Page 13).		
Logic Control Ride-Thru	0.5 seconds minimum, 2 seconds typical (refer to Page 13).		
Ground Fault Trip	Phase-to-Ground on Drive Output.		
Short Circuit Trip	Phase-to-Phase on Drive Output.		

Environmental Specifications


Altitude	1000 m (3300 ft) maximum without derating. (refer to the Derating Guidelines on Pages 56-60).		
Ambient Operating Temperature	IP00, Open: 0 to 50 degrees C (32 to 122 degrees F). IP20, NEMA Type 1: 0 to 40 degrees C (32 to 104 degrees F). IP54, NEMA Type 12: 0 to 40 degrees C (32 to 104 degrees F). IP65, NEMA Type 4: 0 to 40 degrees C (32 to 104 degrees F). (refer to the Derating Guidelines on Pages 56-60).		
Storage Temperature (all constructions)	- 40 to 70 degrees C (- 40 to 158 degrees F).		
Relative Humidity	5 to 95% non-condensing.		
Shock	15G peak for 11 ms duration (±1.0 ms).		
Vibration	0.006 inches (0.152 mm) displacement, 1G peak.		
Agency Certification	U.L. Listed CSA Certified	 	
	Marked for all applicable directives ¹		
Emissions	EN 50081-1 EN 50081-2 EN 55011 Class A EN 55011 Class B		
Immunity	EN 50082-1 EN 50082-2 IEC 801-1, 2, 3, 4, 6, 8 per EN 50082-1, 2		
Low Voltage	EN 60204-1 PREN 50178		

¹ Note: Installation guidelines called out in Appendix C of the 1336 PLUS II User Manual (publication 1336 PLUS-5.3) must be adhered to.

Electrical Specifications

Input Data	Voltage Tolerance: -10% of Minimum, +10% of Maximum. Frequency Tolerance: 48-62 Hz. Input Phases: Three-Phase input provides full rating for all drives. Single-Phase operation is possible for A & B Frame drives at a derating of 50%. (refer to frame designations on Page 22 and the Derating Guidelines on Pages 56-60).
Displacement Power Factor	A1 - A3 Frame: 0.80 Standard, 0.95 with Optional Inductor. A4 Frame & Up: 0.95 Standard.
Efficiency	97.5% at rated amps, nominal line volts.
Maximum Short Circuit Current Rating	200,000A rms symmetrical, 600 volts (when used with AC line fuses specified on Page 37).

Control Specifications

Method	Sine coded PWM with programmable carrier frequency. Ratings apply to all drives. A Frame 2-10 kHz. Drive Rating based on 4 kHz. B Frame 2-8 kHz. Drive Rating based on 4 kHz. C & D Frame 2-6 kHz. Drive Rating based on 4 kHz. E Frame & Up 2-6 kHz. Drive Rating based on 2 kHz. (refer to frame designations on Page 22 and the Derating Guidelines on Pages 56-60).
Output Voltage Range	0 to rated voltage.
Output Frequency Range	0 to 400 Hz.
Frequency Accuracy	Digital Input: Within $\pm 0.01\%$ of set output frequency. Analog Input: Within $\pm 0.4\%$ of maximum output frequency.
Selectable Motor Control	 control with full tuning. Standard V/Hz with full custom capability.
Accel/Decel	Two independently programmable accel and decel times. Each time may be programmed from 0 to 3600 seconds in 0.1 second increments ¹ .
Intermittent Overload	Constant Torque: 150% of rated output for 1 minute. Variable Torque: 115% of rated output for 1 minute.
Current Limit Capability	Proactive Current Limit programmable from 20 to 160% of rated output current. Independently programmable proportional and integral gain.
Inverse Time Overload Capability	Class 10 protection with speed sensitive response. Investigated by U.L. to comply with N.E.C. Article 430. U.L. file E59272, volume 4/6.

Display Specifications

Local Programming and Display Panel	Backlit Supertwist LCD display. 2 lines, 16 characters each. Multi-lingual display of status, faults and programming. Process Display provides 2 lines, any 2 parameters, scalable with user text. Selectable "Power Up" display.
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Load Specifications

Requirements	A balanced 3-phase inductive motor load is typical. Drive power rating is based on a typical NEMA Design B, 4 or 6 pole motor.
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¹ 0.1 second increments using a HIM or 0.01 with serial communications.

Specifications

Input/Output Ratings

Requirements: Each 1336 PLUS II Drive has constant and variable torque capabilities.

Note: Drive ratings are at nominal values. Refer to Derating Guidelines on **Pages 56-60**.

Cat. No.	Constant Torque				Variable Torque				Variable Torque			
	Input kVA	Input Amps	Output kVA	Output Amps	Input kVA	Input Amps	Output kVA	Output Amps	Input kVA	Input Amps	Output kVA	Output Amps
200-240V Drives												
AQF05	1.1	2.8	0.9	2.3	1.1	2.8	0.9	2.3				
AQF07	1.4	3.5	1.2	3.0	1.4	3.5	1.2	3.0				
AQF10	2.2	5.4	1.8	4.5	2.2	5.4	1.8	4.5				
AQF15	2.9	7.3	2.4	6.0	2.9	7.3	2.4	6.0				
AQF20	3.9	9.7	3.2	8.0	3.9	9.7	3.2	8.0				
AQF30	5.7	14.3	4.8	12	5.7	14.3	4.8	12				
AQF50	8.5	21.3	7.2	18	8.5	21.3	7.2	18				
AQF75	9.0	22.6	8.8	22	9.0	22.6	8.8	22				
A007	10-12	28	8.8	22	10	23	8.8	22				
A010	12-14	35	14	34	14	35	14	34				
A015	17-20	49	19	48	20	49	19	48				
A020	22-26	63	26	65	26	63	26	65				
A025	26-31	75	31	77	31	75	31	77				
A030	27-33	79	32	80	33	79	32	80				
A040	41-49	119	48	120	49	119	48	120				
A050	52-62	149	60	150	62	149	60	150				
A060	62-74	178	72	180	74	178	72	180				
A075	82-99	238	96	240	99	238	96	240				
A100	100-120	289	116	291	120	289	116	291				
A125	112-134	322	129	325	134	322	129	325				
380-480V Drives												
BRF05	0.9-1.0	1.3	0.9	1.1	1.1	1.4	1.0	1.2	0.9	1.4	1.0	1.33
BRF07	1.3-1.6	2.0	1.3	1.6	1.7	2.1	1.4	1.7	1.4	2.1	1.4	1.89
BRF10	1.7-2.1	2.6	1.7	2.1	2.2	2.8	1.8	2.3	1.8	2.8	1.8	2.55
BRF15	2.2-2.6	3.3	2.2	2.8	2.8	3.5	2.4	3.0	2.3	3.5	2.4	3.33
BRF20	3.0-3.7	4.6	3.0	3.8	3.8	4.8	3.2	4.0	3.2	4.8	3.2	4.44
BRF30	4.2-5.1	6.4	4.2	5.3	5.7	7.2	4.8	6.0	4.7	7.2	4.8	6.66
BRF50	6.6-8.0	10.0	6.7	8.4	8.5	10.7	7.2	9.0	7.0	10.7	7.2	9.99
BRF75	8.9-11.3	13.6	10.6	13.3	13	15.7	12.3	15.4	10.3	15.7	12.3	19.43
BRF100	10.8-13.6	16.4	12.8	16.1	18.6	22.4	17.5	22	14.7	22.4	17.5	22.00
BRF150	16.1-20.4	24.5	19.1	24	20.4	24.5	19.1	24	16.1	24.5	19.1	24.00
BRF200	18-23	28	22	27	23	28	22	27	18	28	22	27.75
B015	16-21	25	19	24.2	23	28	22	27	18	28	22	29.97
B020	21-26	32	25	31	29	35	27	34	23	35	27	37.74
B025	26-33	40	31	39	36	43	33	42	28	43	33	46.62
B030	30-38	46	36	45	41	49	38	48	32	49	38	53.28
BX040	40-50	61	47	59	50	61	47	59	40	61	47	66.60
B040	38-48	58	48	60	52	63	52	65	41	63	52	72.15
B050	48-60	73	60	75	62	75	61	77	49	75	61	83.25
BX060 ¹	62	75	61	77	62	75	61	77	62	75	61	85.47
B060	54-68	82	68	85	77	93	76	96	61	93	76	106.56
B075	69-87	105	84	106	99	119	96	120	78	119	98	133.20
B100	90-114	137	110	138	124	149	120	150	98	149	120	166.50
B125	113-143	172	138	173	148	178	143	180	117	178	143	199.80
BX150	148	178	143	180	148	178	143	180	148	178	143	199.80
B150	130-164	197	159	199	198	238	191	240	157	238	191	266.40
B200	172-217	261	210	263	241	290	233	292	191	290	233	324.12
B250	212-268	322	259	325	268	322	259	325	212	322	259	360.75
BP/BPR250	212-268	322	259	325	297	357	287	360	235	357	287	399.60
BX250	212-268	322	259	325	297	357	287	360	228	357	279	399.60
B300	235-297	357	287	360	350	421	339	425	261	397	319	471.75
BP/BPR300	235-297	357	287	360	350	421	339	425	277	421	339	471.75
B350	277-350	421	339	425	392	471	378	475	294	446	359	527.25
BP/BPR350	277-350	421	339	425	392	471	378	475	310	471	378	527.25
B400	310-392	471	387	475	433	521	418	525	326	496	398	582.75
BP/BPR400	310-392	471	378	475	438	527	424	532	347	527	424	532.05
B450	343-433	521	418	525	486	585	470	590	372	565	454	654.90
BP/BPR450	347-438	527	424	532	438	527	424	532	347	527	424	532.00
B500	385-486	585	470	590	552	664	534	670	437	664	534	743.70
B600	437-552	664	534	670	552	664	534	670	437	664	534	743.70

¹ 480 Volts Only.

Input/Output Ratings (continued)

Cat. No.	Input	Input	Output	Output	Input	Input	Output	Output
	kVA	Amps	kVA	Amps		kVA	Amps	kVA
	500-600V Drives				600V Drives			
CWF10	2.1-2.5	2.4	2.1	2.0	2.5	2.4	2.1	2.0
CWF20	4.2-5.0	4.8	4.2	4.0	5.0	4.8	4.2	4.0
CWF30	6.2-7.5	7.2	6.2	6.0	7.5	7.2	6.2	6.0
CWF50	8.3-10.0	9.6	8.3	8.0	10.0	9.6	8.3	8.0
CWF75	9-11	10	10	10	11	10	10	10
CWF100	11-13	12	12	12	13	12	12	12
CWF150	17-20	19	19	19	20	19	19	19
CWF200	21-26	25	24	24	26	25	24	24
C025	27-32	31	30	30	32	31	30	30
C030	31-37	36	35	35	37	36	35	35
C040	38-45	44	45	45	45	44	45	45
C050	48-57	55	57	57	57	55	57	57
C060	52-62	60	62	62	62	60	62	62
C075	73-88	84	85	85	88	84	85	85
C100	94-112	108	109	109	112	108	109	109
C125	118-142	137	137	138	142	137	137	138
C150	144-173	167	167	168	173	167	167	168
C200	217-261	251	251	252	261	251	251	252
C250	244-293	282	283	284	293	282	283	284
CX300	256-307	295	297	300	307	295	297	298
C300	258-309	297	299	300	309	297	299	300
C350	301-361	347	349	350	361	347	349	350
CP/CPR350	301-361	347	349	350	361	347	349	350
C400	343-412	397	398	400	412	397	398	400
CP/CPR400	343-412	397	398	400	412	397	398	400
C450	386-464	446	448	450	464	446	448	450
C500	429-515	496	498	500	515	496	498	500
C600	515-618	595	598	600	618	595	598	600

Control Inputs

Option L4E/L7E¹ or L4
Contact Closure Interface Board Requirements

Contacts must be capable of operating at 10mA current levels without signal degradation. Reed type input devices are recommended.

The L4E/L7E options are compatible with the following Allen-Bradley PLC modules:

- 1771-OYL
- 1771-OZL

Note: Option L4 is the same as Option L4E but without encoder feedback terminals.

Option L5E/L8E¹ or L5
+24V AC/DC Interface Board Requirements

Circuits used with Option L5/L8E must be capable of operating with **high = true logic**.

DC external circuits in the low state must generate a voltage of no more than 8V DC. Leakage current must be less than 1.5 mA into a 2.5k ohm load.

AC external circuits in the low state must generate a voltage of no more than 10V DC. Leakage current must be less than 2.5 mA into a 2.5k ohm load.

Both AC and DC external circuits in the high state must generate a voltage of +20 to +26 volts and source a current of approximately 10 mA for each input.

The L5E/L8E options are compatible with these Allen-Bradley PLC[®] modules:

- 1771-OB
- 1771-OB16
- 1771-OB16
- 1771-OBBD
- 1771-OYL
- 1771-OBND
- 1771-OZL
- 1771-OQ
- 1771-OBB

Note: Option L5 is the same as Option L5E but without encoder feedback terminals.

Option L6E/L9E¹ or L6
115V AC Interface Board Requirements

Circuits used with Option L6E/L9E must be capable of operating with **high = true logic**.

In the low state, circuits must generate a voltage of no more than 30V AC. Leakage current must be less than 10 mA into a 6.5k ohm load.

In the high state, circuits must generate a voltage of 90-115V AC \pm 10% and source a current of approximately 20 mA for each input.

The L6E/L9E options are compatible with these Allen-Bradley PLC[®] modules:

- 1771-OW
- 1771-OA
- 1771-OWN
- 1771-OAD

Note: Option L6 is the same as Option L6E but without encoder feedback terminals.

¹The encoder loss detection feature of the 1336 PLUS II requires the use of L7E, L8E or L9E.

Specifications

Flexible Analog Inputs and Outputs

<p>Analog Option Card Slot A</p>	<p>No Option Card</p> <p>LA2</p> <p>LA6</p> <p>LA7</p>	<p>Two single-ended, non-isolated inputs configurable for a potentiometer reference, 0-10V, or 0-20 mA signal</p> <p>Dual Isolated Input Card</p> <p>Isolated Bipolar/Isolated Thermistor Input Card</p> <p>Isolated Bipolar Input/Isolated Input Card</p>
<p>Analog Option Card Slot B</p>	<p>No Option Card</p> <p>LA1</p> <p>LA3</p> <p>LA4</p> <p>LA5</p>	<p>One single-ended, non-isolated input configurable for a potentiometer reference, 0-10V, or 0-20 mA signal and two single-ended, non-isolated 0-10V only outputs.</p> <p>Dual Analog Output Card</p> <p>Dual Isolated Output Card</p> <p>Isolated Input/Isolated Output Card</p> <p>Analog Output/Pulse Output/Pulse Input Card</p>

Digital Inputs and Outputs

<p>Digital Input Specifications</p>	<p>Frequency Resolution:</p> <p>Maximum frequency programmed divided by 32767 (15 bits).</p> <p>60 Hz – 0.0018 Hz.</p> <p>100 Hz – 0.003 Hz.</p> <p>400 Hz – 0.012 Hz.</p>
<p>Contact Outputs</p>	<p>115V AC, 30V DC – 5.0 Amp Resistive – 2.0 Amp Inductive.</p> <p>(2) Form C Contacts.</p> <p>(2) Form A Contacts.</p> <p>All contacts are fully programmable for closure relative to 17 different drive variables selected through the "CR1-4 Out Select" parameters.</p>

Encoder Inputs

<p>Requirements</p>	<p>Line Driver Encoder 5V DC or 8-15V DC Output.</p> <p>Minimum Current – 10mA per Channel.</p> <p>Quadrature or Pulse.</p> <p>Single Ended or Differential.</p> <p>Maximum Input Frequency – 250 kHz</p>
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Serial Communications Options

<p>Remote I/O</p>	<p>Single drop remote I/O to Allen-Bradley PLCs and SLC 500. Supports full block transfer and link mode discrete transfer.</p>
<p>RS232/422/485</p>	<p>DFI Protocol – DH485 Protocol – Customer Specific Protocol.</p>
<p>DeviceNet™</p>	<p>DeviceNet to SCANport module – Available for all drive ratings.</p>
<p>Flex™ I/O</p>	<p>Flex I/O to SCANport module – Available for all drive ratings.</p>
<p>SLC</p>	<p>SLC to SCANport module – Available for all drive ratings.</p>

Sensorless Vector Motor Control

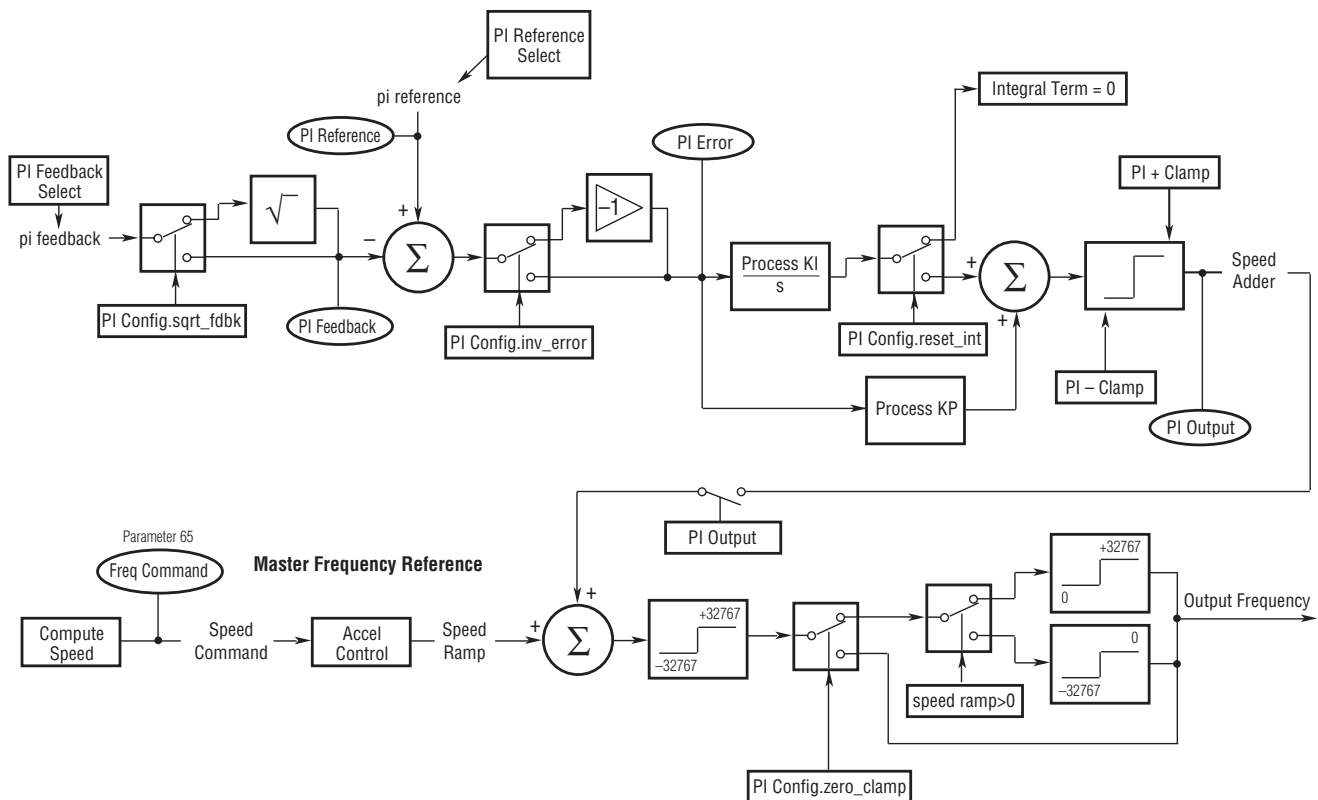
New vector control adds exceptional torque performance to the 1336 PLUS II. This powerful algorithm provides the following performance enhancements.



- Outstanding low speed torque at speeds as low as 15 rpm, providing a 120:1 constant torque speed range.
- Improved acceleration control can provide up to 250% breakaway/acceleration torque to move the toughest loads with ease.
- Solid "out-of-the-box" performance. Enhanced performance can be gained by programming the setup parameters with actual motor nameplate values. Optimum results can be achieved by programming the actual amps required to generate no load flux and the actual voltage needed for IR compensation. If these values are not known, setup procedures can determine the exact values.
- A fast accel mode is provided. Disabling the Adaptive Current Limit feature provides the lowest possible acceleration time for low inertia applications.
- A fast flux-up mode is programmable to aid in acceleration with large motors.
- Selectable Volts/Hertz modes are also available. When selected, they provide full functionality including Start Boost and Run Boost, Boost Slope and "Full Custom" V/Hz operation.

Process PI Control

Simple process control, monitoring a feedback device and adjusting drive output according to feedback requirements can be accomplished with the 1336 PLUS II Proportional and integral gain adjustments plus feedback scaling, error inversion, output clamping and integrator reset functions allow the Process PI function to control the output of the 1336 PLUS II based on the PI reference (setpoint) and the PI feedback. If the feedback device indicates that the process is moving away from the desired setpoint, the PI software responds by adjusting the drive output until the feedback again equals the setpoint. Selectable inputs provide "auto/manual" capability for open loop threading operation. Programmable presets and preloads assure smooth transitions.

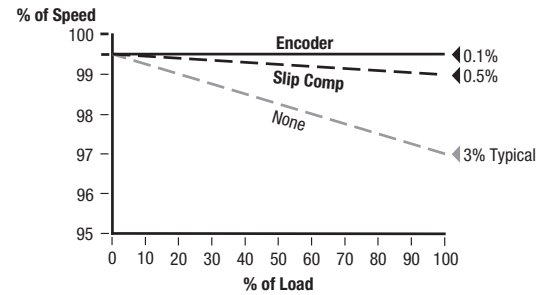


Function Description

Encoder Feedback

For those applications that require excellent speed regulation, the 1336 PLUS II offers optional encoder feedback. This option provides closed loop speed regulation from no load to full load of 0.1%. A feedback encoder and interface board (L4E, L5E or L6E*) with encoder inputs is required.

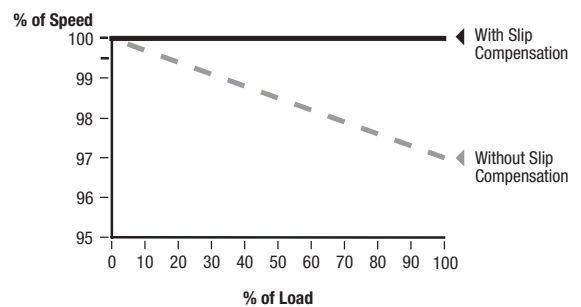
* The encoder loss detection feature of the 1336 PLUS II requires the use of L7E, L8E or L9E.



Slip Compensation

To develop torque in an induction motor, rotor speed “slips” relative to stator speed. The amount of slip is proportional to the motor load. While this increased slip provides the necessary torque, load speed is sacrificed. For those applications where this speed decrease is unacceptable, the 1336 PLUS II offers Slip Compensation. As load increases, the drive automatically increases output frequency to provide needed motor slip without a decrease in speed. The amount of compensation is proportional to the load increase, allowing one setting for the entire speed range. The 1336 PLUS II Slip Compensation function can provide typical speed regulation of 0.5%.

- Slip compensation is based on programmed motor flux instead of drive rated amps, providing more accurate speed regulation.
- Slip compensation is active for both steady state and accel/decel conditions.
- Dynamic response to load changes is parameter adjustable.
- Slip compensation enhances torque performance at all speeds.



Flying Start

Some applications require that the drive “pick up” a spinning load at its current speed and direction, then accelerate or decelerate to the actual commanded speed and direction. The 1336 PLUS II offers a programmable feature called Flying Start. This feature has the ability to determine the speed and direction of a rotating motor and begin its output at that speed. The drive will then bring the motor to the commanded speed. Flying start can be accomplished with or without a motor mounted encoder.

Step Logic

The 1336 PLUS II can be programmed to perform seven logic steps with or without the use of a programmable controller. These steps can be based on:

- Time
- Digital Input
- Time and Digital Input
- Encoder Feedback Counts or Pulse Input Counts

The Step Logic is selected as a continuous loop or fault (End Fault).

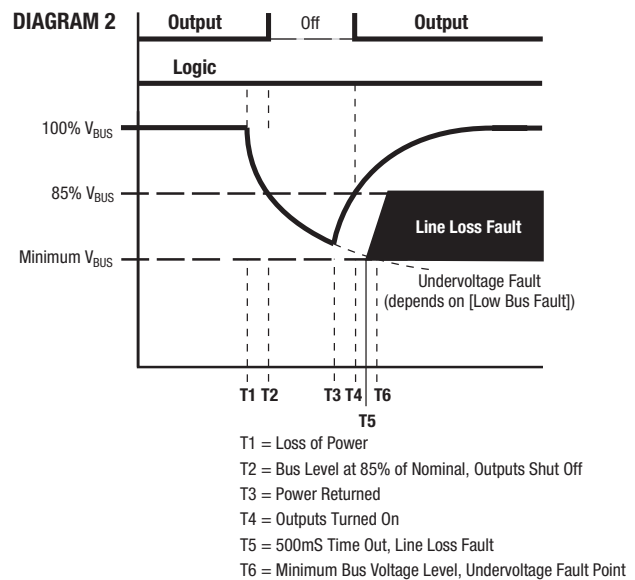
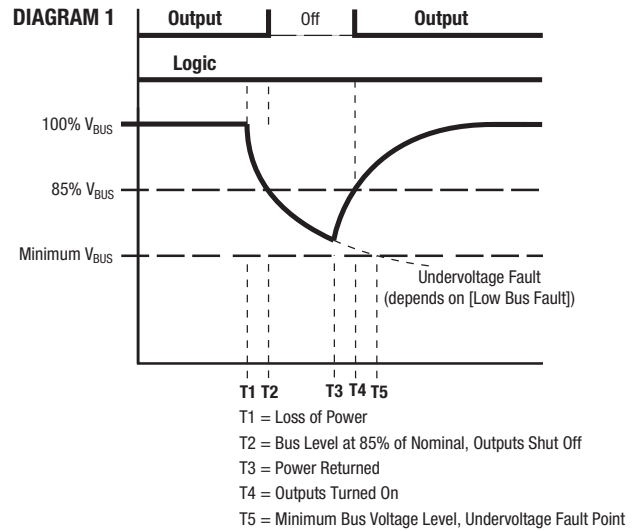
Power Loss Ride-Thru

The 1336 PLUS II has the ability to ride through short power interruptions. On loss of input power to the drive, the drive offers two methods of operation.

With the Line Loss Fault parameter disabled, if a power interruption occurs (**T1**) the drive will continue to operate off stored DC bus energy until bus voltage drops to 85% of its nominal value (**T2**). At this point, the drive output is shut off, allowing the DC bus to discharge more slowly. The drive will retain its logic and operating status as long as bus voltage is above the absolute minimum bus voltage (refer to **Page 7**). If bus voltage should fall below this level (**T5**), the drive will trip and Undervolt Fault will be displayed. If input power is restored before this minimum is reached (**T3**) and bus voltage rises above the 85% level (**T4**), the drive will restore output power to the motor and resume running.

With the Line Loss Fault parameter enabled, if input power is lost (**T1**) the drive will continue to operate until the bus voltage falls below 85% of nominal (**T2**). At this point the drive output is turned off and a 500 mS timer is started. One of the following conditions will then occur:

1. The bus voltage will fall below minimum before the time expires (**T6**). This will generate an Undervoltage Fault.
2. The bus voltage will remain below 85% but above minimum and the timer expires (**T5**). This will generate a Line Loss Fault.
3. The input power is restored (**T3**) and the bus voltage rises above the 85% level before the timer expires (**T4**). This allows the drive to turn its output on and resume running.



Line Loss Restart

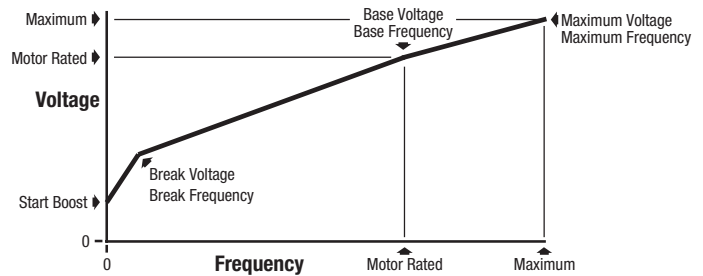
In the event that a line loss condition occurs, the 1336 PLUS II provides a variety of programmable selections to control the timing and method of reconnecting the motor after power returns. Choices include:

- Use flying start to determine motor speed.
- Check for motor terminal voltage to determine motor speed.
- Read the encoder, if present.
- Reconnect at last known output frequency.

Function Description

Volts-per-Hertz

The 1336 PLUS II offers a fully programmable Volts-per-Hertz mode that allows maximum performance for applications requiring multiple motors on a common drive, particularly if the motors are not of equal size and type (i.e. a 3.7 kW/5 HP and 11 kW/15 HP motor on a 15 kW/20 HP drive).



Motor Overload Protection

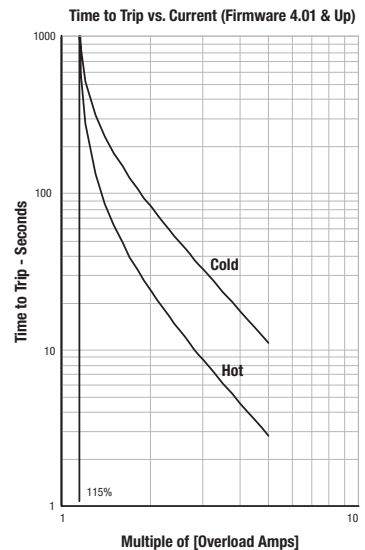
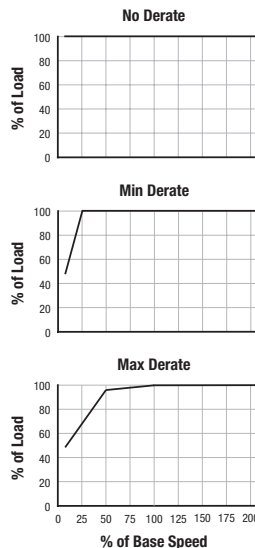
Motor I²t protection is separated from the drive power overload feature. The electronic motor overload operates independently to provide improved Class 10 protection. Operation at full load amps will raise the overload to approximately 70-80% of its trip level. Overloading beyond FLA will move the value towards tripping level (100%) based on I²t Trip curves are provided for both hot and cold states. Parameter settings include:

- Overload Amps from the motor nameplate FLA.
- Motor OL Fault parameter to disable the fault condition.
- In addition, Bit 14 (Motor OL Trip) of the Drive Alarm parameter is high (1) any time the existing level of output current will cause an Overload Fault to occur.

The overload feature remains speed sensitive with 3 derating choices:

- Max Derate is used for motors not designed for variable speed.
- Min Derate is used for motors with a 4:1 speed range (not intended for operation below 25% of base Speed).
- No Derate is used for variable speed motors with a speed range capability of 10:1 or better.

Overload Patterns



Auto Economizer

This feature combines stator flux control with an economizer routine to help the end user save energy costs. The Auto Economizer monitors drive current and compares it against the full load amps (Overload Amps) that the user has programmed into the drive. In load situations (i.e. idle) where the actual current draw of the motor is significantly less than the programmed overload amps, the drive will automatically begin reducing the output voltage to the motor. This minimizes flux current in a lightly loaded motor and results in a lower kW usage.

Braking

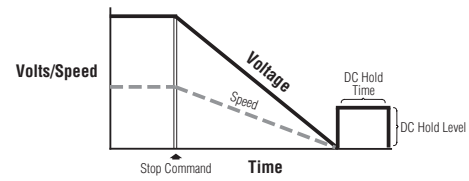
Many applications require a “holding brake” function to stop motor rotation between operations. The 1336 PLUS II provides a programmable DC Hold level and DC Hold time to develop holding torque in the motor after a ramp-to-stop.

For applications that require a quick stopping time, the 1336 PLUS II can “inject” a DC voltage into the motor for a programmed time to brake the motor to a stop. While this does not take the place of an external brake for emergency stopping, it is an effective stopping method under normal operation.

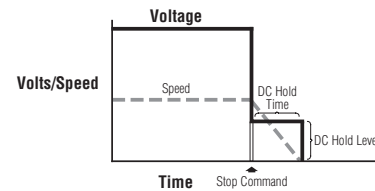
The drive is capable of extended or unlimited injection braking for both stopping and holding a motor. It provides:

- Injection braking at selectable levels for extended periods up to 90 seconds.
- Extended Hold Braking (up to 90 seconds).
- Continuous (event ended) Hold Braking. This is accomplished by setting the Stop mode to “Ramp to Hold”. In this mode, the drive will decelerate according to the programmed decel ramp. When the drive reaches zero Hertz output, it will supply programmed current for hold braking per the DC Hold Level parameter (limited to 70% of drive rating) until;
 - a) a Start command is issued,
 - or
 - b) the Enable input is opened.

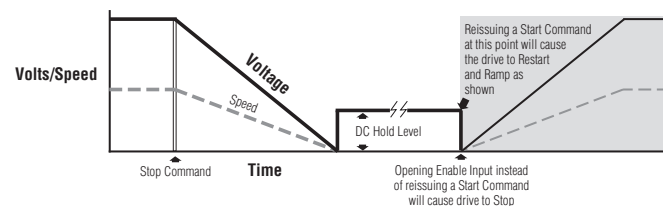
Ramp-to-Stop



Brake-to-Stop



Ramp-to-Hold



Reset/Run

The 1336 PLUS II offers the ability to automatically reset a fault (if the condition that causes the fault is no longer present) and restart. Both the number of reset attempts (0-9) and the time between reset attempts (0-30 Sec.) are programmable. If the condition causing the fault is still present when the number of “reset/run tries” is exceeded, the drive will shut down and issue a “Max Retries Exceeded” Fault. This feature will not operate for ground faults or shorted output faults.

Owners

The 1336 PLUS II displays which of the available adapters currently “owns” certain control functions. To avoid conflict, some owners are exclusive (only one device can issue a direction command), while others can have multiple control (many devices can simultaneously issue a start command). Owner displays are excellent diagnostic tools, displaying precisely where drive control commands are coming from.

0 0 0 0 0 0 1 0

Typical Owner Direction Command

Adapter 1 currently controlling direction

Masks

All external control connections to the 1336 PLUS II are made through a multi-connection communication bus called SCANport. A Frame drives have 5 available adapter ports while B Frame & larger drives have 6 ports. With the possibility of many devices able to issue drive control functions (start, stop, reverse, speed reference, etc.), the 1336 PLUS II offers a mask for each control function that gives the user complete flexibility to lock out any function (except stop) from any port.

1 1 1 0 1 1 1

Typical Jog Mask

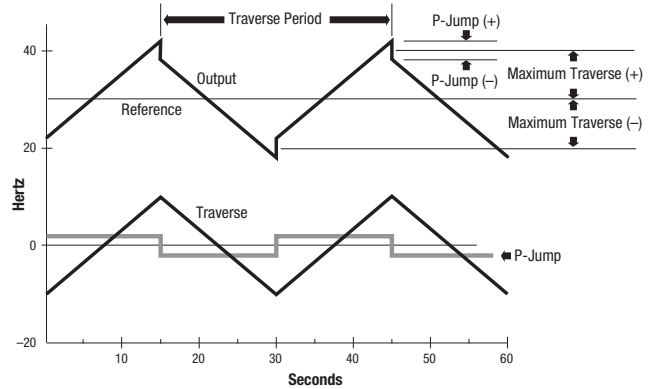
Allows jog from Adapter 1
Denies jog from Adapter 3

Function Description

Traverse Function

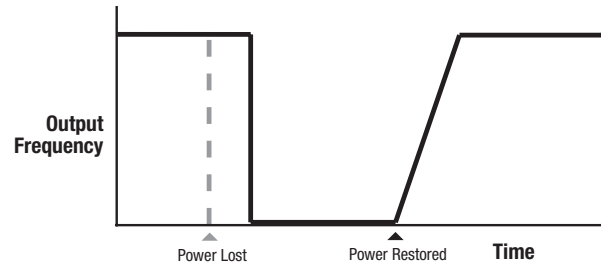
The 1336 PLUS II output frequency can be programmed to modulate around a set frequency. This is accomplished by programming three parameters to develop an inertia compensated triangular waveform – Traverse Period, Max Traverse, and P Jump. In surface driven winding applications, the waveform developed can be used by traverse drives to perform the traverse function electronically.

A traverse drive will move the thread back and forth in a diamond pattern to distribute the thread evenly across a tube surface. To prevent a build up of thread at the same points on the surface, this pattern must be altered. This can be accomplished by continuously varying the speed of the traverse in a cyclical manner over a specified speed range. With the use of inertia compensation, the result is a series of distributed diamond patterns over the entire tube surface.



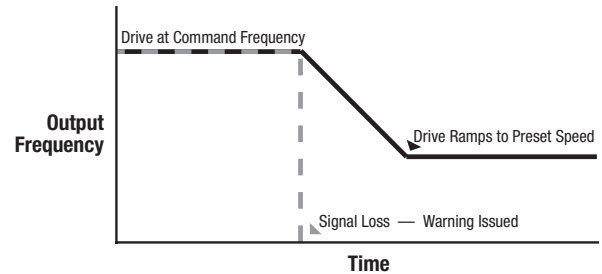
Run On Power Up

For applications that require unattended operation, the 1336 PLUS II offers the ability to resume running once power is restored after a power outage. If "Run On Power Up" is activated and input power is lost, when power is restored the drive will **automatically restart** and run at current command speed if all required signals are present (Enable, Auxiliary, Not-Stop and Start).



4-20mA Loss Select

Many control systems issue a 4-20 mA control signal for the drive to use as a speed reference. The drive will run at minimum speed with a 4 mA signal and maximum speed with a 20 mA signal. The drive can also invert this signal to run minimum speed at 20 mA and maximum speed at 4 mA. Since a minimum signal of 4 mA is required, the drive must have a "fall back" instruction in the event of a signal loss (failed transducer or broken wire). The 1336 PLUS II contains a "loss select" parameter that offers five choices for signal failure mode.

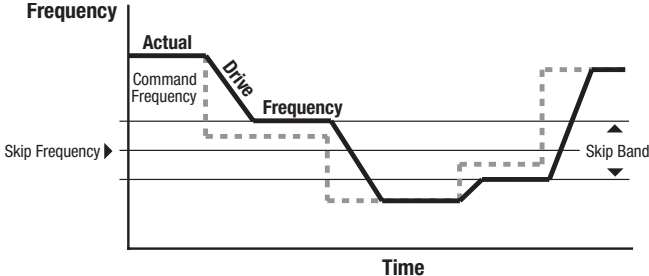


1. Stop the drive and issue a fault.
2. Go to minimum speed and issue a warning.
3. Go to maximum speed and issue a warning.
4. Maintain speed and issue a warning.
5. Go to a preset speed and issue a warning.

Function Description

Skip Frequencies

Many mechanical systems have resonant frequencies that can cause severe vibration. If these systems are run at these speeds continuously, this vibration can cause mechanical breakdowns. The 1336 PLUS II offers three programmable Skip Frequencies that prevent the drive from running continuously at resonant speeds. An additional parameter allows a programmable Skip Bandwidth around the skip frequencies



Process Display

In order to provide complete flexibility in monitoring drive performance, the 1336 PLUS II offers a Process Mode for the liquid crystal super-twist display on the Human Interface Module. This feature provides two lines of 16 characters each that can display any two drive parameters scaled into user selectable units. Each line uses 8 value display characters and 8 programmable text characters to create the process display. Simple keystrokes can designate the process display as the standard display shown at power up.



Fault Buffer

The 1336 PLUS II contains a fault buffer that records the last four faults the drive experienced. The buffer stores faults in a first-in first-out manner. Additional diagnostic parameters are listed in the Diagnostic Group (Refer to the Parameter List on **Page 18**).

