



Allen-Bradley

**Technical Data -
Phase I Control**



**PowerFlex® 700S
High Performance
AC Drive**



**Rockwell
Automation**

PowerFlex 700S AC Drives Technical Data — Phase I Control

The Allen-Bradley PowerFlex® 700S AC drive, a version of PowerFlex 700 power platform, offers high performance drive control, advanced features and more built-in diagnostics for handling the most demanding drive applications. The PowerFlex 700S with DriveLogix™ combines the powerful performance and flexible control of PowerFlex AC drives with the high-performance Logix™ engine to produce a highly functional, cost-effective drive and control solution.



**PowerFlex 700S
AC Drive**



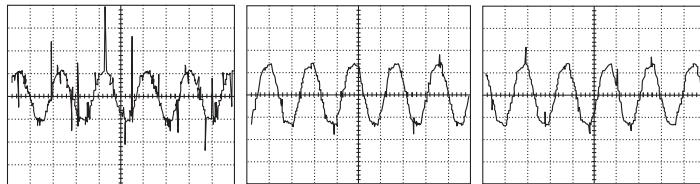
**PowerFlex 700S AC Drive
with DriveLogix**

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Packaging and Mounting

- The innovative bookshelf design allows **Zero Stacking™** or side-by-side mounting of the drives with no required clearance between them. With no minimum spacing between drives, valuable panel space is conserved and installation cost is reduced.

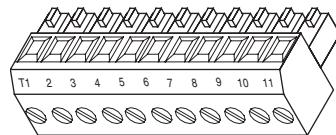


Noise Reduction Charts

- The design of the PowerFlex family of drives incorporates proven **noise reduction components** on both the input and output of the drive. Many of the global EMC standards can be met and many noise related application concerns can be reduced or eliminated using a standard "out-of-the-box" PowerFlex drive with no additional hardware or cost.

By also incorporating higher rated components and significant voltage suppression devices for both phase-to-phase and phase-to-ground protection, power conditioning concerns and the need for additional hardware are significantly reduced.

- Pull-apart** control terminal blocks for easy wiring and quick disconnect.



- DriveLogix** offers embedded Logix control for application programmability and control of auxiliary functions in one package, the PowerFlex 700S with DriveLogix.
 - Common programming environment and multiple programming languages supported by all Logix platforms.
 - Ladder Diagram, Function Block Diagram, Sequential Function Chart and Structured Text.
 - Eight (8) separate tasks including one (1) continuous and seven (7) periodic. Each task can support up to 32 programs and an unlimited number of routines for program organization.
 - 256 Kbytes of standard user memory and optional 768 Kbyte configuration.
 - Non-volatile storage available with the memory expansion option provides long term memory storage without a battery.
 - Local connections for up to eight (8) Flex I/O™ modules.
 - Communication options include the RS-232 port and the same optional communication daughter cards used by the FlexLogix™ controller.
 - Virtual backplane concept for program portability to other Logix platforms, seamless integration into the NetLinx™ architecture and direct drive communication.



Start Up, Programming

- The PowerFlex 700S has optimized global voltage settings for quick configuration anywhere in the world. Multiple reset defaults make setup for your voltage/frequency fast and easy.



- An optional LCD Human Interface Module (HIM) provides programming, start up information, diagnostics and other information in full, easy to understand text. The display is a 7 line by 21 character backlit LCD screen. Four styles are available; full numeric keypad, operating and programming keys only and programming only.

Integrated Software DriveTools™ SP

A powerful new PC based software suite, for programming, configuration and troubleshooting.

- DriveExecutive™ - for online/offline configuration and management of drives and drive peripherals.
- DriveObserver™ - for real time trending of drive information.



RSLogix™ 5000

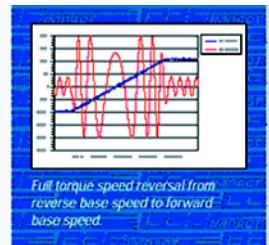
The PowerFlex 700S with DriveLogix utilizes RSLogix 5000, v10.0 or greater, with embedded DriveExecutive Lite for programming, configuration and troubleshooting the drive and embedded Logix controller.



- Single programming software package for the entire family of Logix 5000 products.
- Reduces learning curve between controllers.
- Multiple IEC1131-3 programming languages.
- Symbolic tag and structure data model.
- Integrated sequential and motion control.
- Power programming tools to increase productivity.

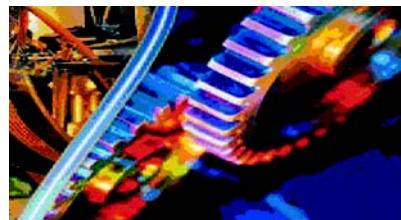
Operation

- **Multiple high performance motor control algorithms:** Flux Vector Control utilizes patented FORCE™ Technology for sensor and sensorless induction motor control and Brushless Permanent Magnet motor operation, provide maximum application flexibility.

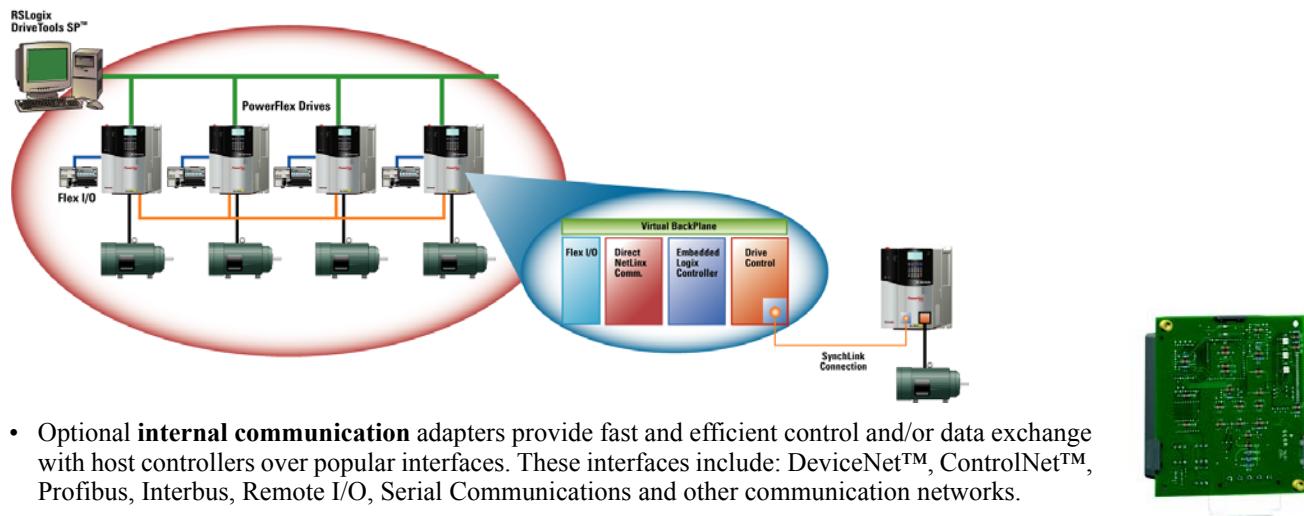


- An **array of feedback options**, including two (2) standard incremental encoders and optional resolver high resolution encoder optimize the accuracy of speed and position regulators. A Temposonics linear device option is also available.

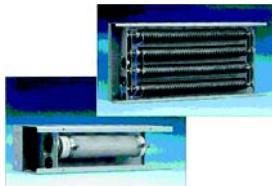
- An integrated position loop for applications from simple indexing to electronic line shaft.



- SynchLink™, a high performance, high speed, drive-to-drive link for transmitting synchronized and application data. The SynchLink fiber optic link provides the highest level of multiple drive coordination.



- Optional **internal communication** adapters provide fast and efficient control and/or data exchange with host controllers over popular interfaces. These interfaces include: DeviceNet™, ControlNet™, Profibus, Interbus, Remote I/O, Serial Communications and other communication networks.



- Standard chopper transistor and separately mounted or drive mounted resistors provide cost effective dynamic braking solutions.



Support

Rockwell Automation is committed to maintaining and supporting Allen-Bradley drives and installations. Included in this commitment is start-up support and consultation for drive applications.

ProtectionPlus Drive Start-Up

With ProtectionPlus Drive Start-Up Services from Rockwell Automation, users can leverage the extensive product and industry experience of Rockwell Automation technicians to quickly commission drives and reduce the time between integration and actual start-up.

ProtectionPlus Drive Start-Up Services verify drive installation to ensure proper electrical, mechanical and environmental criteria are met. This includes verification of power and I/O wiring to the drive, custom drive configuration/tuning to meet application specific requirements, and diagnosing/troubleshooting problems that occur during a standalone drive start-up. ProtectionPlus can also extend an eligible product parts warranty and add a labor warranty. For more information about ProtectionPlus Drive Services, contact your local Rockwell Automation sales office or authorized distributor, or visit: <http://support.rockwellautomation.com/SupportPrograms/>.

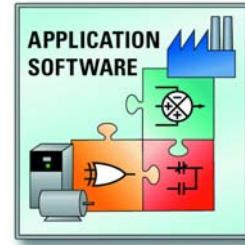
SupportPlus

For consultation on high performance drive applications, the SupportPlus program is offered. SupportPlus uses expert level Rockwell Automation system engineers to support the user's engineering team. SupportPlus engineers will work with the end user to layout the appropriate architecture, configure drives, recommend programming techniques and provide application assistance on the most effective ways to implement the control solution.

For more information, please call 262-512-8176 or refer to www.ab.com/support/abdrives.

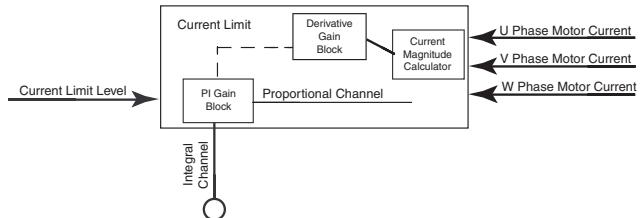
Drive Application Software

Drive Application Software brings together an outstanding range of application experience and performance drive products to provide the user with pre-engineered & cost effective drive application solutions. For more information, refer to our web site: www.ab.com/drives/drvappsw

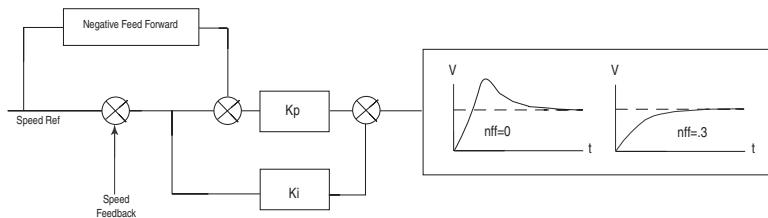


Performance

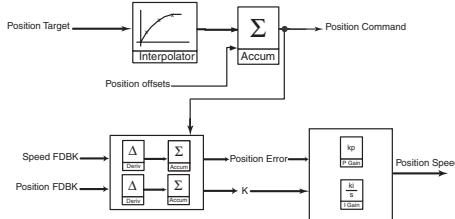
Digital Current Regulator outperforms older style analog regulators in speed, repeatability and drift.



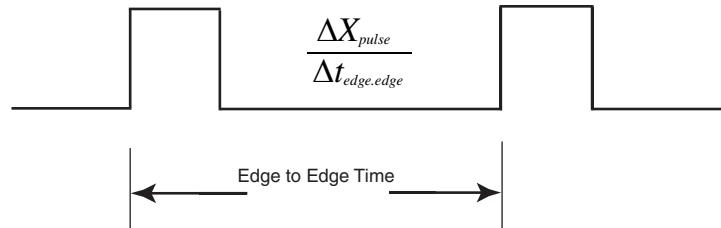
Negative Feed Forward reduces or eliminates overshoot during step speed changes. Helpful in preventing backup during stopping.



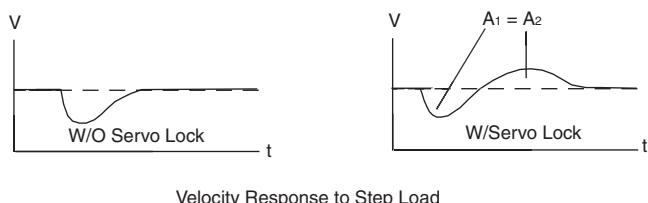
Coarse-to-Fine interpolation for **DriveLogix Motion**, direct positioning for precise control and point-to-point for indexing are all features of the **Integral Position Loop**. The loop easily handles applications such as simple indexing and electronic line shaft.



Advanced **Edge-to-Edge Algorithms** and pulse position averaging provides extremely accurate speed measurement and excellent performance at very low speed.

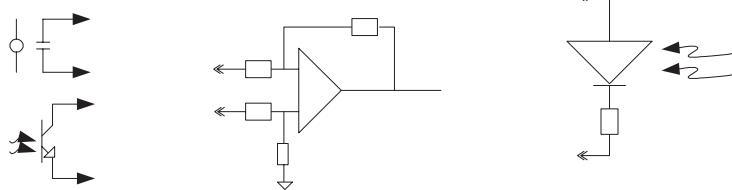


Servo Lock compensates for lost position during step loads to the velocity regulator. Offers optimum performance for draw applications and others.

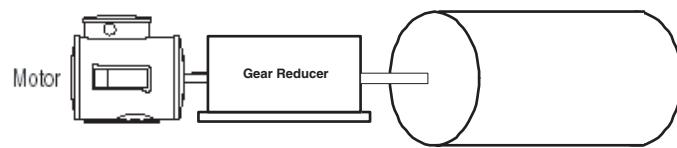


Performance, Cont.

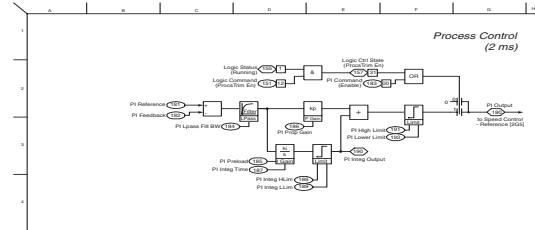
High Speed Analog & Digital I/O execute in 0.5 mSec or less to provide fast response and fast capture for registration information and position data. Output relays, optically isolated and differentially isolated I/O are supplied.



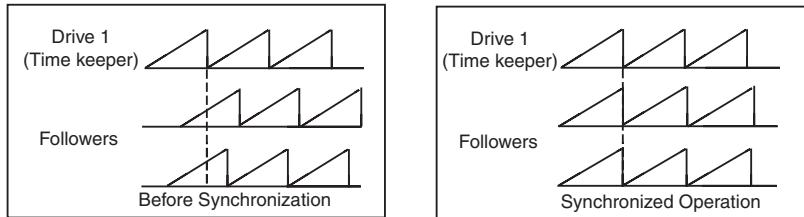
Inertia Adaptation stabilizes inertia disconnect due to gear boxes or flexible couplings. It also provides broadband resonance compensation, allowing up to 4x improvement to speed regulator bandwidth.



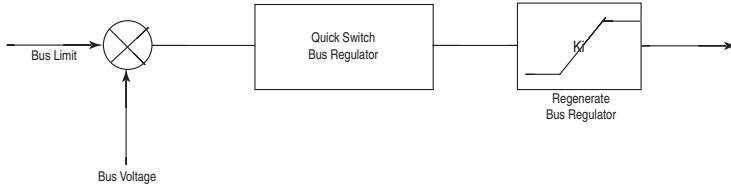
An **Enhanced Process Loop** executes 6 times faster than previous loops, providing greatly improved dynamic response in tension control applications.



The **Control Loops** within each drive are **Synchronized**. In addition, the control loops for all drives on SynchLink are synchronized within uSeconds. This provides exceptional link coordination and tracking for critical applications.



The **Enhanced Bus Regulator** reacts 4 times faster than previous products, providing quicker stops without over-voltage issues and outstanding performance in other regenerative applications.



Product Selection

208/240V AC, Three-Phase Drives

240V AC Input				208V AC Input						IP20, NEMA Type 1		Frame Size
Output Amps			Normal Duty - HP	Heavy Duty - HP	Output Amps			Normal Duty - kW	Heavy Duty - kW	Catalog Number		
Cont. ①	1 Min.	3 Sec.			Cont.	1 Min.	3 Sec.			20D...		
4.2	4.8	6.4	1.0	0.75	4.8	5.6	7.0	0.75	0.37	B4P2A0EYNANNNN	1	
6.8	9.0	12	2.0	1.5	7.8	10.4	13.8	1.5	0.75	B6P8A0EYNANNNN	1	
9.6	10.6	14.4	3.0	2.0	11	12.1	17	2.2	1.5	B9P6A0EYNANNNN	1	
15.3	16.8	23	5.0	3.0	17.5	19.3	26.3	4.0	2.2	B015A0EYNANNNN	1	
22	24.2	33	7.5	5.0	25.3	27.8	38	5.5	4.0	B022A0EYNANNNN	1	
28	33	44	10	7.5	32.2	38	50.6	7.5	5.5	B028A0EYNANNNN	2	
42	46.2	63	15	10	48.3	53.1	72.5	11	7.5	B042A0EYNANNNN	3	
52	63	80	20	15	56	64	86	15	11	B052A0EYNANNNN	3	
70	78	105	25	20	78.2	86	117.3	18.5	15	B070A0ENNANNNN	4	
80	105	136	30	25	92	117.3	156.4	22	18.5	B080A0ENNANNNN	4	
104 (80) ②	115 (120)	175 (160)	40	30	120 (92)	132 (138)	175 (175)	30	22	B104A0ENNANNNN	5	
130 (104) ②	143 (156)	175 (175)	50	40	130 (104)	143 (156)	175 (175)	30	30	B130A0ENNANNNN	5	
154 (130) ②	169 (195)	231 (260)	60	50	177 (150)	195 (225)	266 (300)	45	37	B154A0ENNANNNN	6	
192 (154) ②	211 (231)	288 (308)	75	60	221 (177)	243 (266)	308 (308)	55	45	B192A0ENNANNNN	6	

380-480V AC, Three Phase Drives

480V AC Input				380-400V AC Input						IP20, NEMA Type 1		Frame Size
Output Amps			Normal Duty - HP	Heavy Duty - HP	Output Amps			Normal Duty - kW	Heavy Duty - kW	Catalog Number		
Cont. ①	1 Min.	3 Sec.			Cont.	1 Min.	3 Sec.			20D...		
2.1	2.4	3.2	1	0.75	2.1	2.4	3.2	0.75	0.55	D2P1A0EYNANNNN	1	
3.4	4.5	6	2	1.5	3.5	4.5	6	1.5	0.75	D3P4A0EYNANNNN	1	
5	5.5	7.5	3	2	5	5.5	7.5	2.2	1.5	D5P0A0EYNANNNN	1	
8	8.8	12	5	3	8.7	9.9	13.2	4	2.2	D8P0A0EYNANNNN	1	
11	12.1	16.5	7.5	5	11.5	13	17.4	5.5	4	D011A0EYNANNNN	1	
14	16.5	22	10	7.5	15.4	17.2	23.1	7.5	5.5	D014A0EYNANNNN	1	
22	24.2	33	15	10	22	24.2	33	11	7.5	D022A0EYNANNNN	1	
27	33	44	20	15	30	33	45	15	11	D027A0EYNANNNN	2	
34	40.5	54	25	20	37	45	60	18.5	15	D034A0EYNANNNN	2	
40	51	68	30	25	43	56	74	22	18.5	D040A0EYNANNNN	3	
52	60	80	40	30	56	64	86	30	22	D052A0EYNANNNN	3	
65	78	104	50	40	72	84	112	37	30	D065A0EYNANNNN	3	
77 (65) ②	85 (98)	116 (130)	60	50	85 (72) ③	94 (108)	128 (144)	45	37	D077A0ENNANNNN	4	
96 (77) ②	106 (116)	144 (154)	75	60	105 (85)	116 (128)	158 (170)	55	45	D096A0ENNANNNN	5	
125 (96) ②	138 (144)	163 (168)	100	75	125 (96)	138 (144)	163 (168)	55	45	D125A0ENNANNNN	5	
156 (125) ②	172 (188)	233 (250)	125	100	170 (140)	187 (210)	255 (280)	90	75	D156A0ENNANNNN	6 ⑤	
180 (156) ②	198 (234)	270 (312)	150	125	205 (170) ④	220 (255)	289 (313)	110	90	D180A0ENNANNNN	6	
248 (180) ②	273 (270)	372 (360)	200	150	260 (205)	286 (308)	380 (410)	132	110	D248A0ENNBNNNNN	6 ⑤	
261 (205) ②	287 (308)	410 (410)	200	150	261 (205)	287 (308)	410 (410)	132	110	D261A0ENNBNNNNN	9 ⑥	
300 (245) ②	330 (368)	450 (490)	250	200	300 (245)	330 (368)	450 (490)	160	132	D300A0ENNBNNNNN	9 ⑥	
385 (300) ②	424 (450)	600 (600)	300	250	385 (300)	424 (450)	600 (600)	200	160	D385A0ENNBNNNNN	10 ⑥	
460 (385) ②	506 (578)	770 (770)	350	300	460 (385)	506 (578)	770 (770)	250	200	D460A0ENNBNNNNN	10 ⑥	
500 (420) ②	550 (630)	750 (840)	450	350	500 (420)	550 (630)	750 (840)	250	200	D500A0ENNBNNNNN	10 ⑥	

① Catalog number corresponds to output amps in these columns. Drive must be programmed to lower voltage to obtain higher currents shown at right.

② These drives have dual current ratings; one for normal duty applications, and one for heavy duty applications (in parenthesis). The drive may be operated at either rating.

③ 380-400V, 85 A rating is limited to 45°C surrounding air.

④ 380-400V, 205 A rating is limited to 40°C surrounding air.

⑤ Preliminary data - check for availability before ordering.

⑥ Rating is limited to 40°C surrounding air.

Product Selection, Cont.

600-690V AC Three-Phase Drives

600V AC Input ①				690V AC Input						IP20, NEMA Type 1		Frame Size
Output Amps			Normal Duty - HP	Heavy Duty - HP	Output Amps			Normal Duty - kW	Heavy Duty - kW	Catalog Number		
Cont. ②	1 Min.	3 Sec.			Cont.	1 Min.	3 Sec.			20D...		
11	13.5	18	10	7.5	—	—	—	—	—	E011A0ENYANNNN	1 ③	
17	18.7	25.5	15	10	—	—	—	—	—	E017A0ENYANNNN	1 ③	
22	25.5	34	20	15	—	—	—	—	—	E022A0ENYANNNN	2	
27	33	44	25	20	—	—	—	—	—	E027A0ENYANNNN	2	
32	40.5	54	30	25	—	—	—	—	—	E032A0ENYANNNN	3	
41	48	64	40	30	—	—	—	—	—	E041A0ENYANNNN	3	
52	61.5	82	50	40	—	—	—	—	—	E052A0ENYANNNN	3	
62	78	104	60	50	—	—	—	—	—	E062A0ENNANNNN	4	
77 (63) ②	85 (94)	116 (126)	75	60	82 (60)	90 (90)	120 (123)	75	55	E077A0ENNANNNN	5	
99 (77) ②	109 (116)	126 (138)	100	75	98 (82) ④	108 (123)	127 (140)	90	75	E099A0ENNANNNN	5	
125 (99) ②	138 (149)	188 (198)	125	100	119 (98)	131 (147)	179 (196)	110	90	E125A0ENNANNNN	6	
144 (125) ②	158 (188)	216 (250)	150	125	142 (119)	156 (179)	213 (238)	132	110	E144A0ENNANNNN	6	
170 (144) ②	187 (216)	245 (245)	150	150	170 (144)	187 (216)	245 (245)	160	132	E170A0ENNBNANE	9	
208 (170) ②④	230 (250)	289 (289)	200	150	208 (170) ③	230 (250)	289 (289)	200	160	E208A0ENNBNANE	9	
261 (208) ②	287 (312)	375 (375)	250	200	261 (208)	287 (312)	375 (375)	250	200	E261A0ENNBNANE	10	
325 (261) ②	358 (392)	470 (470)	350	250	325 (261)	358 (392)	470 (470)	315	250	E325A0ENNBNANE	10	
385 (325) ②	424 (488)	585 (585)	400	350	385 (325)	424 (488)	585 (585)	355	315	E385A0ENNBNANE	10	
416 (325) ②	458 (488)	585 (585)	450	350	416 (325)	458 (488)	585 (585)	400	315	E416A0ENNBNANE	10	

- ① Catalog number corresponds to output amps in this column. Drive must be programmed to lower voltage to obtain higher currents shown at right.
- ② These drives have dual current ratings; one for normal duty applications, and one for heavy duty applications (in parenthesis). The drive may be operated at either rating.
- ③ Check for availability before ordering.
- ④ Rating is limited to 40°C surrounding air.
- ⑤ CE Certification testing has not been performed on 600V class drives.

DC Input Voltage Classes

DC Input for Frames 1-4 use the same codes as AC Input. Refer to the table below for Frames 5 and up.

650V DC Input				IP21, NEMA Type 1				Frame Size
Output Amps			Normal Duty - HP	Heavy Duty - HP	DC Precharge		Catalog Number	
Cont	1 Min.	3 Sec.	- HP	- HP			20D...	
96 (77)	106 (116)	144 (154)	75	60	N		J096A0ENNANNNN	5
96 (77)	106 (116)	144 (154)	75	60	Y		R096A0ENNANNNN	5
125 (96)	138 (144)	163 (168)	100	75	N		J125A0ENNANNNN	5
125 (96)	138 (144)	163 (168)	100	75	Y		R125A0ENNANNNN	5
156 (125)	172 (188)	233 (250)	125	100	N		J156A0ENNANNNN	6
156 (125)	172 (188)	233 (250)	125	100	Y		R156A0ENNANNNN	6
180 (156)	198 (234)	270 (312)	150	125	N		J180A0ENNANNNN	6
180 (156)	198 (234)	270 (312)	150	125	Y		R180A0ENNANNNN	6
248 (180)	273 (270)	372 (360)	200	150	N		J248A0ENNANANE	6
248 (180)	273 (270)	372 (360)	200	150	Y		R248A0ENNANANE	6
261 (205)	287 (308)	410	200	150	N		J261NOENNBNNNNN	9 ①
300 (245)	330 (368)	450 (490)	250	200	N		J300NOENNBNNNNN	9 ①
385 (300)	424 (450)	600	300	250	N		J385NOENNBNNNNN	10 ①
460 (385)	506 (577)	770	350	300	N		J460NOENNBNNNNN	10 ①
500 (420)	550 (630)	750 (840)	450	350	N		J500NOENNBNNNNN	10 ①

- ① Available through Drive Systems ONLY.

Note: The maximum drive to motor power ratio is 2:1.

Product Selector

Catalog Number Explanation

Position													
1-3	4	5-7	8	9	10	11	12	13	14	15	16	17	
20D	D	2P1	A	0	E	Y	N	A	N	N	N	N	
a	b	c	d	e	f	g	h	i	j	k	l	m	

a					
Drive					
Code	Type				
20D	PowerFlex 700S				
b					
Voltage Rating					
Code	Voltage	Ph.	Prechg.		
B	240V ac	3	—		
C	400V ac	3	—		
D	480V ac	3	—		
E	600V ac *	3	—		
F	690V ac ▶	3	—		
H	540V dc #	—	N		
J	650V dc #	—	N		
N	325V dc ▶	—	Y		
P	540V dc ▶	—	Y		
R	650V dc ▶	—	Y		
T	810V dc ▶	—	Y		
W	932V dc ▶	—	Y		

* Note: CE Certification testing has not been performed on 600V class drives.

▶ Frames 5 & 6 Only.

Frames 5 & up.

c1			
ND Rating			
208/240V, 60Hz Input			
Code	208V Amps	240V Amps	Hp
4P2	4.8	4.2	1.0
6P8	7.8	6.8	2.0
9P6	11	9.6	3.0
015	17.5	15.3	5.0
022	25.3	22	7.5
028	32.2	28	10
042	48.3	42	15
052	56	52	20
070	78.2	70	25
080	92	80	30
104	120	104	40
130	130	130	50
154	177	154	60
192	221	192	75

c2			
ND Rating			
400V, 50 Hz Input			
Code	Amps	kW	
2P1	2.1	0.75	
3P5	3.5	1.5	
5P0	5.0	2.2	
8P7	8.7	4.0	
011	11.5	5.5	
015	15.4	7.5	
022	22	11	
030	30	15	
037	37	18.5	
043	43	22	
056	56	30	
072	72	37	
085	85	45	
105	105	55	
125	125	55	
140	140	75	
170	170	90	
205	205	110	
260	260	132	
261	261	132	
300	300	160	
385	385	200	
460	460	250	
500	500	250	
590	590	315	
650	650	355	
730	730	400	

c3			
ND Rating			
480V, 60 Hz Input			
Code	Amps	Hp	
2P1	2.1	1.0	
3P4	3.4	2.0	
5P0	5	3.0	
8P0	8	5.0	
011	11	7.5	
014	14	10	
022	22	15	
027	27	20	
034	34	25	
040	40	30	
052	52	40	
065	65	50	
077	77	60	
096	96	75	
125	125	100	
156	156	125	
180	180	150	
248	248	200	
261	261	200	
300	300	250	
385	385	300	
460	460	350	
500	500	450	
590	590	500	
650	650	500	
730	730	600	

c4			
ND Rating			
600V, 60Hz Input *			
Code	Amps	Hp	
022	22	20	
027	27	25	
032	32	30	
041	41	40	
052	52	50	
062	62	60	
077	77	75	
099	99	100	
125	125	125	
144	144	150	

* CE Certification testing has not been performed on 600V class drives.

Product Selector, Cont.

Catalog Number Explanation, Cont.

c5

ND Rating		
690V, 50 Hz Input *		
Code	Amps	Hp
052	52	45
060	60	55
082	82	75
098	98	90
119	119	110
142	142	132

* CE Certification testing has not been performed on 600V class drives.

d

Enclosure	
Code	Enclosure
A	IP20, NEMA Type 1
N	Open/IP00 #

Frames 9 & up Only.

e

HIM	
Code	Operator Interface
0	Blank Cover
2	Digital LCD
3	Full Numeric LCD
5	Prog. Only LCD
C	Full Numeric LCD, Door Mount #

Frames 10 & up only.

f

Documentation	
Code	Documents
E	Quick Start Guide
N	No Documentation

g

Brake	
Code	w/Brake IGBT ‡
Y	Yes
N	No

‡ Brake IGBT is standard on Frames 1-3 and optional on Frames 4-9 ONLY.

h

Brake Resistor	
Code	w/Resistor
Y	Yes *
N	No

* Not available for Frame 3 drives or larger.

i

Emission		
Code	CE Filter	CM Choke
A #	Yes	Yes
B #	Yes	No
N \$	No	No

Frames 1-6 Only.

Frames 9 & up Only.

\$ For use on ungrounded distribution systems (Frame 9 drives only).

k

Control Options				
Code	Control Option	Logic Expansion	Synch -Link	Cassette
N	Phase I	N/A	Stand ard	None

l

Feedback	
Code	Option
N	None
A	Resolver
B	Stegman Hi-Resolution Encoder
C	Multi-Device Interface

m

Additional Config.	
Code	Description
N	Phase I Control
A	Phase I DriveLogix5720
B	Phase I DriveLogix5720 w/Expanded Memory

j

Comm Slot	
Code	Version
N	None
C	DPI ControlNet (Coax)
D	DPI DeviceNet
E	DPI EtherNet/IP
Q	DPI ControlNet (Fiber)
R	DPI RIO
S	DPI RS-483 DF1
1	DriveLogix ControlNet (Coax)
2	DriveLogix ControlNet Redundant (Coax)
3	DriveLogix ControlNet (Fiber)
4	DriveLogix ControlNet Redundant (Fiber)
5	DriveLogix DeviceNet (Open Conn.)
6	DriveLogix EtherNet/IP

Option Selection

Position 9 — Human Interface Modules (HIM)

Position 9 of the catalog string specifies the Human Interface Module (HIM). Four LCD styles are available as well as a blank plate. These HIMs can be factory or user installed.

20D	D	2P1	A	O	E	Y	N	A	N	N	N	N
Drive	Voltage Rating	Rating	Enclosure	HIM	Documentation	Brake	Brake Resistor	Emission	Comm Slot	I/O	Additional Feedback	Additional Config

Default Value “O” — HIM Not Used (Blank Cover Included)

Choose User Installed Kit— Leave Default Value “O”

User Installed Kit

Description	Handheld/Local (Drivemount)	Remote (Panel Mount) IP 66, UL Type 4x12
	Catalog Number	Catalog Number
No HIM (Blank Plate)	20-HIM-A0	—
LCD Display, Digital Speed	20-HIM-A2	—
LCD Display, Full Numeric Keypad	20-HIM-C3	20-HIM-C3 ②
		20-HIM-C3S ③
LCD Display, Programmer Only	20-HIM-A5	20-HIM-C5 ②
		20-HIM-C5S ③

① For indoor use only.

② Includes a PowerFlex HIM Interface Cable (20-HIM-H10).

③ Includes a 1202-C30 cable (3 meters).

Human Interface Module Accessories

Description	Catalog Number
Bezel Kit for LCD HIMs, NEMA 1 ①	20-HIM-B1
PowerFlex HIM Interface Cable, 1 m (39 in.) ②	20-HIM-H10
Cable Kit (Male-Female) ③	
0.33 Meters (1.1 Feet)	1202-H03
1 Meter (3.3 Feet)	1202-H10
3 Meter (9.8 Feet)	1202-H30
9 Meter (29.5 Feet)	1202-H90
DPI SCANport™ One to Two Port Splitter Cable	1203-SQ3

① Includes an interface cable (1202-C30) for connection to drive.

② Required only when HIM is used as handheld or remote.

③ Required in addition to 20-HIM-H10 for distances to a total maximum of 10 Meter (32.8 Feet).

Choose Catalog Code— Factory Installed Option

Factory Installed Options



Catalog Code: 0
No HIM (Blank Cover)



Catalog Code: 2
LCD Digital Speed



Catalog Code: 3
LCD Full Numeric



Catalog Code: 5
LCD Programmer Only



Catalog Code: C
Door Mounted LCD
Full Numeric
Frame 10 Only

Option Selection, Cont.

Position 10 — Manuals

Position 10 specifies documentation. Printed user manuals are not included with the drive. A CD with complete documentation is included, as well as a Quick Start guide that offers contacts with Technical Support and the appropriate web sites.

20D	D	2P1	A	0	E	Y	N	A	N	N	N	N
Drive	Voltage Rating	Rating	Enclosure	HIM	Documentation	Brake	Brake Resistor	Emission	Comm Slot	I/O	Additional Feedback	Additional Config
Default Value "E" — Quick Start Guide												
Choose Catalog Code												
Description												Catalog Code
No Documentation												N

Position 11 — Internal Brake IGBT

Position 11 specifies the Internal Dynamic Brake IGBT. It is standard on Frames 1-3 and optional on Frame 4-9 drives only.

20D	D	2P1	A	0	E	Y	N	A	N	N	N	N
Drive	Voltage Rating	Rating	Enclosure	HIM	Documentation	Brake	Brake Resistor	Emission	Comm Slot	I/O	Additional Feedback	Additional Config
Default Value "Y" — Dynamic Braking Not Used												
No User Installed Kit Available — Leave Default Value "Y"												
Choose Catalog Code — Factory Installed Option												
Factory Installed Option												
Drive Input Voltage					Brake IGBT		Frame		Catalog Code			
208-480V AC					Standard		1-3		Y			
					Optional		4-9		Y			
							4-9		N			

Option Selection, Cont.

Position 12 — Internal Dynamic Brake Resistors

Position 12 specifies the Internal Dynamic Brake resistor. It is available on all Frame 1 & 2 drives. This option provides limited dynamic without increasing the drive “footprint.”

Important: These resistors have a limited duty cycle. Refer to the PowerFlex Dynamic Braking Selection Guide to determine if an internal resistor will be sufficient for your application. An external resistor may be required.

20D	D	2P1	A	0	E	Y	N	A	N	N	N	N
Drive	Voltage Rating	Rating	Enclosure	HIM	Documentation	Brake	Brake Resistor	Emission	Comm Slot	I/O	Additional Feedback	Additional Config
Default Value “N” — Dynamic Braking Not Used												
Choose User Installed Kit — Leave Default Value “N”												
User Installed Kit												
Drive Input Voltage	Brake Resistance	Frame	Catalog Number									
208-240V AC	62 Ohm	1 (0.5-5.0 HP)	20DB-DB1-1									
	22 Ohm	1 (7.5 HP)	20DB-DB2-1									
	22 Ohm	2	20DB-DB1-2									
380-480V AC	115 Ohm	1	20BD-DB1-1									
	62 Ohm	2	20BD-DB1-2									
Choose Catalog Code — Factory Installed Option												
Factory Installed Option												
Drive Input Voltage	Frame	Brake Resistance	Catalog Code									
208-240V AC	1 (0.5-5 HP)	62 Ohm	Y									
	1 (7.5 HP)	62 Ohm	Y									
	2	22 Ohm	Y									
380-480V AC	1	115 Ohm	Y									
	2	62 Ohm	Y									

Position 13 — EMC Filter

Position 13 identifies the presence of the internal EMC filter (meets second environment CE standards) and provides the option of noise reducing common mode cores. Cores are standard on all drives below 200 HP.

20D	D	2P1	A	0	E	Y	N	A	N	N	N	N
Drive	Voltage Rating	Rating	Enclosure	HIM	Documentation	Brake	Brake Resistor	Emission	Comm Slot	I/O	Additional Feedback	Additional Config
Default Value “A” — Standard Filter Used												
Default Value “B” — Frame 9 & up												
Choose Catalog Code — Factory Installed Option												
Factory Installed Option												
Drive Input Voltage	CE Filter	Frame	Catalog Code	CM Choke								
208/240V AC	Standard	1-6	A	Y								
380-480V AC		1-6	A	Y								
		9-10	B	N								
		No	9	N								

For use on ungrounded distribution systems.

Option Selection, Cont.

Position 14 — Communication Options

Position 14 selects a communications adapter for the drive or the DriveLogix option. Adapters are available for most industrial networks and can be supplied factory installed or as field kits.

20D	D	2P1	A	0	E	Y	N	A	N	N	N	N
Drive	Voltage Rating	Rating	Enclosure	HIM	Documentation	Brake	Brake Resistor	Emission	Comm Slot	I/O	Additional Feedback	Additional Config

Default Value "N" — Communication Adapters Not Used

Choose User Installed Kit — Leave Default Value "N"

User Installed Kit

Description	Catalog Number
ControlNet Communication Adapter - DPI	20-COMM-C
DeviceNet Communication Adapter - DPI	20-COMM-D
EtherNet/IP Communication Adapter - DPI	20-COMM-E
Interbus Communication Adapter - DPI	20-COMM-I
PROFIBUS DP Communication Adapter - DPI	20-COMM-P
ControlNet Communication Adapter - Fiber Optic	20-COMM-Q
Remote I/O Communication Adapter - DPI	20-COMM-R
RS-485 DF1 Communication Adapter- DPI	20-COMM-S
DriveLogix Comm Option, ControlNet (Coax) ①	1788-CNC
DriveLogix Comm Option, ControlNet Redundant (Coax) ①	1788-CNCR
DriveLogix Comm Option, ControlNet (Fiber) ①	1788-CNCF
DriveLogix Comm Option, ControlNet Redundant (Fiber) ①	1788-CNFR
DriveLogix Comm Option, DeviceNet (Open Conn.) ①	1788-DNBO
DriveLogix Comm Option, EtherNet/IP (Twisted Pair) ①	1788-ENBT

Note: All **DriveLogix** Comm. Options require Control Assembly Cover kit on page 20.

Choose Catalog Code — Factory Installed Option

Factory Installed Option

Description	Catalog Code
ControlNet Communication Adapter (Coax) - DPI	C
DeviceNet Communication Adapter- DPI	D
EtherNet/IP Communication Adapter- DPI	E
ControlNet Communication Adapter - Fiber Optic	Q
Remote I/O Communication Adapter- DPI	R
RS-485 DF1 Communication Adapter- DPI	S
DriveLogix Comm Option, ControlNet (Coax) ①	1
DriveLogix Comm Option, ControlNet Redundant (Coax) ①	2
DriveLogix Comm Option, ControlNet (Fiber) ①	3
DriveLogix Comm Option, ControlNet Redundant (Fiber) ①	4
DriveLogix Comm Option, DeviceNet (Open Conn.) ①	5
DriveLogix Comm Option, EtherNet/IP (Twisted Pair) ①	6

① Must have **DriveLogix** option.

Position 15 — I/O Option Card

Position 15 is reserved for I/O option cards. Since a complete set of analog and digital I/O is included on the PowerFlex 700S, this position is unused and is always "N."

20D	D	2P1	A	0	E	Y	N	A	N	N	N	N
Drive	Voltage Rating	Rating	Enclosure	HIM	Documentation	Brake	Brake Resistor	Emission	Comm Slot	I/O	Additional Feedback	Additional Config

Default Value "N" — Fixed Value for All Drives

Option Selection, Cont.

Position 16 — Input Cards for Additional Feedback Devices

Position 16 specifies the input card for the desired additional feedback device. Choose between a resolver or high resolution Stegmann encoder.

20D	D	2P1	A	O	E	Y	N	A	N	N	N	N																				
Drive	Voltage Rating	Rating	Enclosure	HIM	Documentation	Brake	Brake Resistor	Emission	Comm Slot	I/O	Additional Feedback	Additional Config																				
Default Value "N" — Standard Encoder Feedback Used																																
Choose User Installed Kit — Leave Default Value "N"																																
User Installed Kit																																
<table border="1"> <thead> <tr> <th>Description</th><th>Catalog Number</th></tr> </thead> <tbody> <tr> <td>Resolver</td><td>20D-RES-A1</td></tr> <tr> <td>Stegmann</td><td>20D-STEG-B1</td></tr> <tr> <td>Multi-Device</td><td>20D-MDI-C1</td></tr> </tbody> </table>													Description	Catalog Number	Resolver	20D-RES-A1	Stegmann	20D-STEG-B1	Multi-Device	20D-MDI-C1												
Description	Catalog Number																															
Resolver	20D-RES-A1																															
Stegmann	20D-STEG-B1																															
Multi-Device	20D-MDI-C1																															
Choose Catalog Code — Factory Installed Kit																																
Factory Installed Kit																																
<table border="1"> <thead> <tr> <th>Description</th><th>Catalog Code</th></tr> </thead> <tbody> <tr> <td>Resolver</td><td>A</td></tr> <tr> <td>Stegmann, Hiperface</td><td>B</td></tr> <tr> <td>Multi-Device Interface</td><td>C</td></tr> <tr> <td>None</td><td>N</td></tr> </tbody> </table>													Description	Catalog Code	Resolver	A	Stegmann, Hiperface	B	Multi-Device Interface	C	None	N										
Description	Catalog Code																															
Resolver	A																															
Stegmann, Hiperface	B																															
Multi-Device Interface	C																															
None	N																															
Acceptable Stegmann Encoders																																
SINCOS Model No.	Cycles/Rev	Built-in Mech Turns Counter																														
SCS-60	512	N																														
SCS-70		N																														
SCM-60		Y																														
SCM-70		Y																														
SCS-KIT-101	1024	N																														
SCM-KIT-101		Y																														
—		Y																														
SRS-25		Y																														
SRS-50		N																														
SRS-60		N																														
SRM-25		Y																														
SRM-50		Y																														
SRM-60		Y																														
SCS-660	1024	N																														
SHS-170 ②	512	N																														
<p>① MDI allows the connection of the Stegmann and Tempsonics linear sensors. Tempsonics sensor can not be used to close motor control or speed loops.</p> <p>② Requires external power supply with sufficient current capability. Not to be used with internal power supply.</p>																																
Acceptable Resolvers																																
<table border="1"> <thead> <tr> <th>Manufacturer</th><th>Mfg. Model No.</th></tr> </thead> <tbody> <tr> <td>Tamagawa</td><td>TS-2014N181E32</td></tr> <tr> <td>Tamagawa</td><td>TS-2014N182E32</td></tr> <tr> <td>Tamagawa</td><td>TS-2014N185E32</td></tr> <tr> <td>Tamagawa</td><td>TS-2087N12E9</td></tr> <tr> <td>Tamagawa</td><td>TS-2087N1E9</td></tr> <tr> <td>Tamagawa</td><td>TS-2087N2E9</td></tr> <tr> <td>Tamagawa</td><td>TS-2087N5E9</td></tr> <tr> <td>Tamagawa</td><td>TS-2087N11E9</td></tr> <tr> <td>Advanced Micro Controls Inc. (AMCI)</td><td>R11X-C10/7</td></tr> </tbody> </table>													Manufacturer	Mfg. Model No.	Tamagawa	TS-2014N181E32	Tamagawa	TS-2014N182E32	Tamagawa	TS-2014N185E32	Tamagawa	TS-2087N12E9	Tamagawa	TS-2087N1E9	Tamagawa	TS-2087N2E9	Tamagawa	TS-2087N5E9	Tamagawa	TS-2087N11E9	Advanced Micro Controls Inc. (AMCI)	R11X-C10/7
Manufacturer	Mfg. Model No.																															
Tamagawa	TS-2014N181E32																															
Tamagawa	TS-2014N182E32																															
Tamagawa	TS-2014N185E32																															
Tamagawa	TS-2087N12E9																															
Tamagawa	TS-2087N1E9																															
Tamagawa	TS-2087N2E9																															
Tamagawa	TS-2087N5E9																															
Tamagawa	TS-2087N11E9																															
Advanced Micro Controls Inc. (AMCI)	R11X-C10/7																															
Motor/Resolver Type																																
<table border="1"> <thead> <tr> <th>Compatible</th></tr> </thead> <tbody> <tr> <td>1326 AB 230V Primary Resolver</td><td>No</td></tr> <tr> <td>1326 AB 230V Secondary Resolver</td><td>Yes</td></tr> <tr> <td>1326 AB 460V Primary Resolver</td><td>Yes</td></tr> <tr> <td>1326 AB 460V Secondary Resolver</td><td>Yes</td></tr> <tr> <td>1326AD 230V Rare Earth</td><td>No</td></tr> <tr> <td>1326AH 460V Explosion Proof Motor Primary Resolver</td><td>Yes</td></tr> <tr> <td>1326AH 460V Explosion Proof Motor Secondary Resolver</td><td>Yes</td></tr> <tr> <td>1326AS 460V Rare Earth</td><td>Yes</td></tr> <tr> <td>MPL 460V</td><td>Yes</td></tr> </tbody> </table>													Compatible	1326 AB 230V Primary Resolver	No	1326 AB 230V Secondary Resolver	Yes	1326 AB 460V Primary Resolver	Yes	1326 AB 460V Secondary Resolver	Yes	1326AD 230V Rare Earth	No	1326AH 460V Explosion Proof Motor Primary Resolver	Yes	1326AH 460V Explosion Proof Motor Secondary Resolver	Yes	1326AS 460V Rare Earth	Yes	MPL 460V	Yes	
Compatible																																
1326 AB 230V Primary Resolver	No																															
1326 AB 230V Secondary Resolver	Yes																															
1326 AB 460V Primary Resolver	Yes																															
1326 AB 460V Secondary Resolver	Yes																															
1326AD 230V Rare Earth	No																															
1326AH 460V Explosion Proof Motor Primary Resolver	Yes																															
1326AH 460V Explosion Proof Motor Secondary Resolver	Yes																															
1326AS 460V Rare Earth	Yes																															
MPL 460V	Yes																															
Supported Linear Sensors																																
<table border="1"> <thead> <tr> <th>Part Number Character</th><th>Characteristic</th></tr> </thead> <tbody> <tr> <td>1</td><td>Input Voltage = +24V</td></tr> <tr> <td>S</td><td>SSI output</td></tr> <tr> <td>2</td><td>Data Length = 24 bits</td></tr> <tr> <td>G</td><td>Output Format = Gray Code</td></tr> <tr> <td>1</td><td>Resolution = 0.005 mm</td></tr> <tr> <td>1</td><td>Performance = Standard</td></tr> <tr> <td>02</td><td>Scale Orientation = Forward-acting Synchronized</td></tr> </tbody> </table>													Part Number Character	Characteristic	1	Input Voltage = +24V	S	SSI output	2	Data Length = 24 bits	G	Output Format = Gray Code	1	Resolution = 0.005 mm	1	Performance = Standard	02	Scale Orientation = Forward-acting Synchronized				
Part Number Character	Characteristic																															
1	Input Voltage = +24V																															
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1	Resolution = 0.005 mm																															
1	Performance = Standard																															
02	Scale Orientation = Forward-acting Synchronized																															

Tempsonics® III Linear sensors with MTS® part numbers ending in 1S2G1102 work with the MDI Option.

Option Selection, Cont.

Position 17 — Additional Configurations

Position 17 is used for any additional options or configurations. The DriveLogix option that integrates the Logix engine directly into the PowerFlex 700S drive is currently available with 256k bytes or 768k bytes of user available memory. To take advantage of non-volatile program storage, utilize the memory expansion option.

20D	D	2P1	A	O	E	Y	N	A	N	N	N	N
Drive	Voltage Rating	Rating	Enclosure	HIM	Documentation	Brake	Brake Resistor	Emission	Comm Slot	I/O	Additional Feedback	Additional Config

Default Value “N” — No Additional Configurations Included

Choose User Installed Kit — Leave Default Value “N”

User Installed Kit

Description	Catalog Number
DriveLogix5720 with Base Memory (Requires Control Assembly Cover kit below)	20D-DL-AO
DriveLogix5720 Memory Expansion	20D-DL-ME1

Control Assembly Cover Kit (Required when ordering Base Memory kit)	20D-CVR-CA1
--	-------------

Choose Catalog Code — Factory Installed Option

Factory Installed Option

Description	Catalog Code
DriveLogix5720 Controller, 256k bytes of User Available Memory	A
DriveLogix5720 Controller, 768k bytes of User Available Memory	B
Phase I Control	N

Accessories

Communication Accessories

Description	Catalog No.
DriveLogix 3 Meter RS-232 Programming Cable ①	1756-CP3
DriveLogix Flex I/O Cable 91.44 cm (36 in.) ①	4100-CCF3
Smart Self-powered Serial Converter (RS-232) includes 1203-SFC and 1202-C10 Cables	1203-SSS
Serial Null Modem Adapter	1203-SNM
ControlNet T-Tap/Right Angle 1 Meter Coax Cable Assembly	1786-TPR

Accessory kits are available to supplement the drive installation or tailor the drive to the particular requirements. These may include installation issues, communications structure or others.

SynchLink Accessories

Description	Catalog No.
SynchLink Base Block (up to 4 splitter blocks)	1751-SLBA/A
SynchLink 4 Port Splitter Block	1751-SL4SP/A
SynchLink Bypass Switch Block	1751-SLBP/A
2x1 Meter Fiber Linx for Power Monitor/SynchLink	1403-CF001
2x3 Meter Fiber Linx for Power Monitor/SynchLink	1403-CF003
2x5 Meter Fiber Linx for Power Monitor/SynchLink	1403-CF005
10 Meter Fiber Linx for Power Monitor/SynchLink	1403-CF010
20 Meter Fiber Linx for Power Monitor/SynchLink	1403-CF020
50 Meter Fiber Linx for Power Monitor/SynchLink	1403-CF050
100 Meter Fiber Linx for Power Monitor/SynchLink	1403-CF100
250 Meter Fiber Linx for Power Monitor/SynchLink	1403-CF250

① For use with DriveLogix option only.

Note: For Flex I/O pricing, please refer to Publication ACIG-PL001.

Note: Please refer to publication number 1756-TD008 for details on SynchLink.

Auxiliary Control Power Supply

Description	Catalog No.
Auxiliary Control Power Supply	20-24V-AUX1

Accessories, Cont.

Isolation Transformers

For installations that have specific types of AC supply configurations or require drive protection due to AC line disturbances, isolation transformers are available.

Motor Rating (HP)	240V, 60 Hz, Three-Phase 240V Primary & 240V Secondary	460V, 60 Hz, Three-Phase 460V Primary & 460V Secondary	575V, 60 Hz, Three-Phase 575V Primary & 575V Secondary
	IP 32(Nema Type 3R) Catalog Number	IP 32(Nema Type 3R) Catalog Number	
0.33	1321-3TW005-AA	1321-3TW005-BB	—
0.5	1321-3TW005-AA	1321-3TW005-BB	—
0.75	1321-3TW005-AA	1321-3TW005-BB	—
1	1321-3TW005-AA	1321-3TW005-BB	1321-3TW005-CC
1.5	1321-3TW005-AA	1321-3TW005-BB	—
2	1321-3TW005-AA	1321-3TW005-BB	1321-3TW005-CC
3	1321-3TW005-AA	1321-3TW005-BB	1321-3TW005-CC
5	1321-3TW007-AA	1321-3TW007-BB	1321-3TW007-CC
7.5	1321-3TW011-AA	1321-3TW011-BB	1321-3TW011-CC
10	1321-3TW014-AA	1321-3TW014-BB	1321-3TW014-CC
15	1321-3TW020-AA	1321-3TW020-BB	1321-3TW020-CC
20	1321-3TW027-AA	1321-3TW027-BB	1321-3TW027-CC
25	1321-3TW034-AA	1321-3TW034-BB	1321-3TW034-CC
30	1321-3TW040-AA	1321-3TW040-BB	1321-3TW040-CC
40	1321-3TW051-AA	1321-3TW051-BB	1321-3TW051-CC
50	1321-3TH063-AA	1321-3TH063-BB	1321-3TH063-CC
60	1321-3TH075-AA	1321-3TH075-BB	1321-3TH075-CC
75	1321-3TH093-AA	1321-3TH093-BB	1321-3TH093-CC
100	—	1321-3TH118-BB	1321-3TH118-CC
125	—	1321-3TH145-BB	1321-3TH145-CC
150	—	1321-3TH175-BB	1321-3TH175-CC
200	—	1321-3TH220-BB	—

Line/Load Reactors

For impedance matching, protection from AC line disturbances or motor protection, reactors are available for both the input and output sides of the drive.

Input and Output Line Reactors - 240V, 60 Hz, Three-Phase

Drive Catalog Number	Duty	HP	Input Line Reactor ①		Output Line Reactor ①	
			IP 00 (Open Style)	IP 11 (Nema Type 1)	IP 00 (Open Style)	IP 11 (Nema Type 1)
			Catalog Number	Catalog Number	Catalog Number	Catalog Number
3% Impedance – 240V, 60 Hz, Three-Phase						
20DB2P2	Heavy Duty	0.33	1321-3R2-D	1321-3RA2-D	1321-3R2-D	1321-3RA2-D
20DB2P2	Normal Duty	0.5	1321-3R2-D	1321-3RA2-D	1321-3R2-D	1321-3RA2-D
20DB4P2	Heavy Duty	0.75	1321-3R4-A	1321-3RA4-A	1321-3R4-A	1321-3RA4-A
20DB4P2	Normal Duty	1	1321-3R4-A	1321-3RA4-A	1321-3R4-A	1321-3RA4-A
20DB6P8	Heavy Duty	1.5	1321-3R8-A	1321-3RA8-A	1321-3R8-A	1321-3RA8-A
20DB6P8	Normal Duty	2	1321-3R8-A	1321-3RA8-A	1321-3R8-A	1321-3RA8-A
20DB9P6	Heavy Duty	2	1321-3R8-A	1321-3RA8-A	1321-3R12-A	1321-3RA12-A
20DB9P6	Normal Duty	3	1321-3R12-A	1321-3RA12-A	1321-3R12-A	1321-3RA12-A
20DB015	Heavy Duty	3	1321-3R12-A	1321-3RA12-A	1321-3R18-A	1321-3RA18-A
20DB015	Normal Duty	5	1321-3R18-A	1321-3RA18-A	1321-3R18-A	1321-3RA18-A
20DB022	Heavy Duty	5	1321-3R18-A	1321-3RA18-A	1321-3R25-A	1321-3RA25-A
20DB022	Normal Duty	7.5	1321-3R25-A	1321-3RA25-A	1321-3R25-A	1321-3RA25-A

See page 25 for Notes.

Accessories, Cont.

Drive Catalog Number	Duty	HP	Input Line Reactor ①		Output Line Reactor ①	
			IP 00 (Open Style)	IP 11 (Nema Type 1)	IP 00 (Open Style)	IP 11 (Nema Type 1)
			Catalog Number	Catalog Number	Catalog Number	Catalog Number
3% Impedance – 240V, 60 Hz, Three-Phase						
20DB028	Heavy Duty	7.5	1321-3R25-A	1321-3RA25-A	1321-3R35-A	1321-3RA35-A
20DB028	Normal Duty	10	1321-3R35-A	1321-3RA35-A	1321-3R35-A	1321-3RA35-A
20DB042	Heavy Duty	10	1321-3R35-A	1321-3RA35-A	1321-3R45-A	1321-3RA45-A
20DB042	Normal Duty	15	1321-3R45-A	1321-3RA45-A	1321-3R45-A	1321-3RA45-A
20DB052	Heavy Duty	15	1321-3R45-A	1321-3RA45-A	1321-3R55-A	1321-3RA55-A
20DB052	Normal Duty	20	1321-3R55-A	1321-3RA55-A	1321-3R55-A	1321-3RA55-A
20DB070	Heavy Duty	20	1321-3R80-A	1321-3RA80-A	1321-3R80-A	1321-3RA80-A
20DB070	Normal Duty	25	1321-3R80-A	1321-3RA80-A	1321-3R80-A	1321-3RA80-A
20DB080	Heavy Duty	25	1321-3R80-A	1321-3RA80-A	1321-3R100-A	1321-3RA100-A
20DB080	Normal Duty	30	1321-3R100-A	1321-3RA100-A	1321-3R100-A	1321-3RA100-A
20DB104	Heavy Duty	30	1321-3R80-A	1321-3RA80-A	1321-3R80-A	1321-3RA80-A
20DB104	Normal Duty	40	1321-3R100-A	1321-3RA100-A	1321-3R100-A	1321-3RA100-A
20DB130	Heavy Duty	40	1321-3R100-A	1321-3RA100-A	1321-3R100-A	1321-3RA100-A
20DB130	Normal Duty	50	1321-3R130-A	1321-3RA130-A	1321-3R130-A	1321-3RA130-A
20DB154	Heavy Duty	50	1321-3R130-A	1321-3RA130-A	1321-3R130-A	1321-3RA130-A
20DB154	Normal Duty	60	1321-3R160-A	1321-3RA160-A	1321-3R160-A	1321-3RA160-A
20DB192	Heavy Duty	60	1321-3R160-A	1321-3RA160-A	1321-3R160-A	1321-3RA160-A
20DB192	Normal Duty	75	1321-3R200-A	1321-3RA200-A	1321-3R200-A	1321-3RA200-A
20DB260	Heavy Duty	75	1321-3R200-A	1321-3RA200-A	1321-3R200-A	1321-3RA200-A
20DB260	Normal Duty	100	1321-3RB250-A	1321-3RAB250-A	1321-3RB250-A	1321-3RAB250-A
5% Impedance – 240V, 60 Hz, Three-Phase						
20DB2P2	Heavy Duty	0.33	1321-3R2-A	1321-3RA2-A	1321-3R2-A	1321-3RA2-A
20DB2P2	Normal Duty	0.5	1321-3R2-A	1321-3RA2-A	1321-3R2-A	1321-3RA2-A
20DB4P2	Heavy Duty	0.75	1321-3R4-B	1321-3RA4-B	1321-3R4-B	1321-3RA4-B
20DB4P2	Normal Duty	1	1321-3R4-B	1321-3RA4-B	1321-3R4-B	1321-3RA4-B
20DB6P8	Heavy Duty	1.5	1321-3R8-B	1321-3RA8-B	1321-3R8-B	1321-3RA8-B
20DB6P8	Normal Duty	2	1321-3R8-B	1321-3RA8-B	1321-3R8-B	1321-3RA8-B
20DB9P6	Heavy Duty	2	1321-3R8-B	1321-3RA8-B	1321-3R12-B	1321-3RA12-B
20DB9P6	Normal Duty	3	1321-3R12-B	1321-3RA12-B	1321-3R12-B	1321-3RA12-B
20DB015	Heavy Duty	3	1321-3R12-B	1321-3RA12-B	1321-3R18-B	1321-3RA18-B
20DB015	Normal Duty	5	1321-3R18-B	1321-3RA18-B	1321-3R18-B	1321-3RA18-B
20DB022	Heavy Duty	5	1321-3R18-B	1321-3RA18-B	1321-3R25-B	1321-3RA25-B
20DB022	Normal Duty	7.5	1321-3R25-B	1321-3RA25-B	1321-3R25-B	1321-3RA25-B
20DB028	Heavy Duty	7.5	1321-3R25-B	1321-3RA25-B	1321-3R35-B	1321-3RA35-B
20DB028	Normal Duty	10	1321-3R35-B	1321-3RA35-B	1321-3R35-B	1321-3RA35-B
20DB042	Heavy Duty	10	1321-3R35-B	1321-3RA35-B	1321-3R45-B	1321-3RA45-B
20DB042	Normal Duty	15	1321-3R45-B	1321-3RA45-B	1321-3R45-B	1321-3RA45-B
20DB052	Heavy Duty	15	1321-3R45-A	1321-3RA45-A	1321-3R55-B	1321-3RA55-B
20DB052	Normal Duty	20	1321-3R55-A	1321-3RA55-A	1321-3R55-B	1321-3RA55-B
20DB070	Heavy Duty	20	1321-3R80-B	1321-3RA80-B	1321-3R100-B	1321-3RA100-B
20DB070	Normal Duty	25	1321-3R100-B	1321-3RA100-B	1321-3R100-B	1321-3RA100-B
20DB080	Heavy Duty	25	1321-3R100-B	1321-3RA100-B	1321-3R130-B	1321-3RA130-B
20DB080	Normal Duty	30	1321-3R100-B	1321-3RA100-B	1321-3R130-B	1321-3RA130-B
20DB104	Heavy Duty	30	1321-3R80-B	1321-3RA80-B	1321-3R80-B	1321-3RA80-B
20DB104	Normal Duty	40	1321-3R100-B	1321-3RA100-B	1321-3R100-B	1321-3RA100-B
20DB130	Heavy Duty	40	1321-3R100-B	1321-3RA100-B	1321-3R100-B	1321-3RA100-B
20DB130	Normal Duty	50	1321-3R130-B	1321-3RA130-B	1321-3R130-B	1321-3RA130-B
20DB154	Heavy Duty	50	1321-3R160-B	1321-3RA160-B	1321-3R160-B	1321-3RA160-B
20DB154	Normal Duty	60	1321-3R200-B	1321-3RA200-B	1321-3R200-B	1321-3RA200-B
20DB192	Heavy Duty	60	1321-3R200-B	1321-3RA200-B	1321-3R200-B	1321-3RA200-B
20DB192	Normal Duty	75	1321-3R200-B	1321-3RA200-B	1321-3R200-B	1321-3RA200-B
20DB260	Heavy Duty	75	1321-3RB250-B	1321-3RAB250-B	1321-3RB250-B	1321-3RAB250-B
20DB260	Normal Duty	100	1321-3RB250-B	1321-3RAB250-B	1321-3RB250-B	1321-3RAB250-B

See page 25 for Notes.

Accessories, Cont.

Input and Output Line Reactors - 480V, 60 Hz, Three-Phase

Drive Catalog Number	Duty	HP	Input Line Reactor ^①		Output Line Reactor ^①	
			IP 00 (Open Style)	IP 11 (Nema Type 1)	IP 00 (Open Style)	IP 11 (Nema Type 1)
			Catalog Number	Catalog Number	Catalog Number	Catalog Number
3% Impedance – 480V, 60 Hz, Three-Phase						
20DD1P1	Heavy Duty	0.33	1321-3R1-C	1321-3RA1-C	1321-3R2-B	1321-3RA2-B
20DD1P1	Normal Duty	0.5	1321-3R1-C	1321-3RA1-C	1321-3R2-B	1321-3RA2-B
20DD2P1	Heavy Duty	0.75	1321-3R2-A	1321-3RA2-A	1321-3R2-A	1321-3RA2-A
20DD2P1	Normal Duty	1	1321-3R2-A	1321-3RA2-A	1321-3R2-A	1321-3RA2-A
20DD3P4	Heavy Duty	1.5	1321-3R4-C	1321-3RA4-C	1321-3R4-B	1321-3RA4-B
20DD3P4	Normal Duty	2	1321-3R4-B	1321-3RA4-B	1321-3R4-B	1321-3RA4-B
20DD5P0	Heavy Duty	2	1321-3R4-B	1321-3RA4-B	1321-3R8-C	1321-3RA8-C
20DD5P0	Normal Duty	3	1321-3R4-B	1321-3RA4-B	1321-3R8-C	1321-3RA8-C
20DD8P0	Heavy Duty	3	1321-3R4-B	1321-3RA4-B	1321-3R8-B	1321-3RA8-B
20DD8P0	Normal Duty	5	1321-3R8-B	1321-3RA8-B	1321-3R8-B	1321-3RA8-B
20DD011	Heavy Duty	5	1321-3R8-B	1321-3RA8-B	1321-3R12-B	1321-3RA12-B
20DD011	Normal Duty	7.5	1321-3R12-B	1321-3RA12-B	1321-3R12-B	1321-3RA12-B
20DD014	Heavy Duty	7.5	1321-3R12-B	1321-3RA12-B	1321-3R18-B	1321-3RA18-B
20DD014	Normal Duty	10	1321-3R18-B	1321-3RA18-B	1321-3R18-B	1321-3RA18-B
20DD022	Heavy Duty	10	1321-3R18-B	1321-3RA18-B	1321-3R25-B	1321-3RA25-B
20DD022	Normal Duty	15	1321-3R25-B	1321-3RA25-B	1321-3R25-B	1321-3RA25-B
20DD027	Heavy Duty	15	1321-3R25-B	1321-3RA25-B	1321-3R35-B	1321-3RA35-B
20DD027	Normal Duty	20	1321-3R35-B	1321-3RA35-B	1321-3R35-B	1321-3RA35-B
20DD034	Heavy Duty	20	1321-3R35-B	1321-3RA35-B	1321-3R45-B	1321-3RA45-B
20DD034	Normal Duty	25	1321-3R35-B	1321-3RA35-B	1321-3R45-B	1321-3RA45-B
20DD040	Heavy Duty	25	1321-3R35-B	1321-3RA35-B	1321-3R55-B	1321-3RA55-B
20DD040	Normal Duty	30	1321-3R45-B	1321-3RA45-B	1321-3R55-B	1321-3RA55-B
20DD052	Heavy Duty	30	1321-3R45-B	1321-3RA45-B	1321-3R80-B	1321-3RA80-B
20DD052	Normal Duty	40	1321-3R55-B	1321-3RA55-B	1321-3R80-B	1321-3RA80-B
20DD065	Heavy Duty	40	1321-3R55-B	1321-3RA55-B	1321-3R80-B	1321-3RA80-B
20DD065	Normal Duty	50	1321-3R55-B	1321-3RA55-B	1321-3R80-B	1321-3RA80-B
20DD077	Heavy Duty	50	1321-3R80-B	1321-3RA80-B	1321-3R80-B	1321-3RA80-B
20DD077	Normal Duty	60	1321-3R80-B	1321-3RA80-B	1321-3R80-B	1321-3RA80-B
20DD096	Heavy Duty	60	1321-3R80-B	1321-3RA80-B	1321-3R80-B	1321-3RA80-B
20DD096	Normal Duty	75	1321-3R100-B	1321-3RA100-B	1321-3R100-B	1321-3RA100-B
20DD125	Heavy Duty	75	1321-3R100-B	1321-3RA100-B	1321-3R100-B	1321-3RA100-B
20DD125	Normal Duty	100	1321-3R130-B	1321-3RA130-B	1321-3R130-B	1321-3RA130-B
20DD156	Heavy Duty	100	1321-3R130-B	1321-3RA130-B	1321-3R130-B	1321-3RA130-B
20DD156	Normal Duty	125	1321-3R160-B	1321-3RA160-B	1321-3R160-B	1321-3RA160-B
20DD180	Heavy Duty	125	1321-3R160-B	1321-3RA160-B	1321-3R160-B	1321-3RA160-B
20DD180	Normal Duty	150	1321-3R200-B	1321-3RA200-B	1321-3R200-B	1321-3RA200-B
20DD248	Heavy Duty	150	1321-3R200-B	1321-3RA200-B	1321-3R200-B	1321-3RA200-B
20DD248	Normal Duty	200	1321-3RB250-B	1321-3RAB250-B	1321-3RB250-B	1321-3RAB250-B
20DD261	Normal Duty	150	1321-3R200-B	1321-3RA200-B	1321-3R200-B	1321-3RA200-B
20DD261	Heavy Duty	200	1321-3RB250-B	1321-3RAB250-B	1321-3RB250-B	1321-3RAB250-B
20DD300	Normal Duty	200	1321-3RB250-B	1321-3RAB250-B	1321-3RB250-B	1321-3RAB250-B

See page 25 for Notes.

Accessories, Cont.

Input and Output Line Reactors - 480V, 60 Hz, Three-Phase, Continued

Drive Catalog Number	Duty	HP	Input Line Reactor ①		Output Line Reactor ①	
			IP 00 (Open Style)	IP 11 (Nema Type 1)	IP 00 (Open Style)	IP 11 (Nema Type 1)
			Catalog Number	Catalog Number	Catalog Number	Catalog Number
5% Impedance – 480V, 60 Hz, Three-Phase						
20DD1P1	Heavy Duty	0.33	1321-3R1-B	1321-3RA1-B	1321-3R2-B	1321-3RA2-B
20DD1P1	Normal Duty	0.5	1321-3R1-B	1321-3RA1-B	1321-3R2-B	1321-3RA2-B
20DD2P1	Heavy Duty	0.75	1321-3R2-B	1321-3RA2-B	1321-3R2-B	1321-3RA2-B
20DD2P1	Normal Duty	1	1321-3R2-B	1321-3RA2-B	1321-3R2-B	1321-3RA2-B
20DD3P4	Heavy Duty	1.5	1321-3R4-D	1321-3RA4-D	1321-3R4-C	1321-3RA4-C
20DD3P4	Normal Duty	2	1321-3R4-D	1321-3RA4-D	1321-3R4-C	1321-3RA4-C
20DD5P0	Heavy Duty	2	1321-3R4-C	1321-3RA4-C	1321-3R8-D	1321-3RA8-D
20DD5P0	Normal Duty	3	1321-3R4-C	1321-3RA4-C	1321-3R8-D	1321-3RA8-D
20DD8P0	Heavy Duty	3	1321-3R4-C	1321-3RA4-C	1321-3R8-C	1321-3RA8-C
20DD8P0	Normal Duty	5	1321-3R8-C	1321-3RA8-C	1321-3R8-C	1321-3RA8-C
20DD011	Heavy Duty	5	1321-3R8-C	1321-3RA8-C	1321-3R12-C	1321-3RA12-C
20DD011	Normal Duty	7.5	1321-3R12-C	1321-3RA12-C	1321-3R12-C	1321-3RA12-C
20DD014	Heavy Duty	7.5	1321-3R12-C	1321-3RA12-C	1321-3R18-C	1321-3RA18-C
20DD014	Normal Duty	10	1321-3R18-C	1321-3RA18-C	1321-3R18-C	1321-3RA18-C
20DD022	Heavy Duty	10	1321-3R18-C	1321-3RA18-C	1321-3R25-C	1321-3RA25-C
20DD022	Normal Duty	15	1321-3R25-C	1321-3RA25-C	1321-3R25-C	1321-3RA25-C
20DD027	Heavy Duty	15	1321-3R25-C	1321-3RA25-C	1321-3R35-C	1321-3RA35-C
20DD027	Normal Duty	20	1321-3R35-C	1321-3RA35-C	1321-3R35-C	1321-3RA35-C
20DD034	Heavy Duty	20	1321-3R35-C	1321-3RA35-C	1321-3R45-C	1321-3RA45-C
20DD034	Normal Duty	25	1321-3R35-C	1321-3RA35-C	1321-3R45-C	1321-3RA45-C
20DD040	Heavy Duty	25	1321-3R35-C	1321-3RA35-C	1321-3R55-C	1321-3RA55-C
20DD040	Normal Duty	30	1321-3R45-C	1321-3RA45-C	1321-3R55-C	1321-3RA55-C
20DD052	Heavy Duty	30	1321-3R45-C	1321-3RA45-C	1321-3R80-C	1321-3RA80-C
20DD052	Normal Duty	40	1321-3R55-C	1321-3RA55-C	1321-3R80-C	1321-3RA80-C
20DD065	Heavy Duty	40	1321-3R55-C	1321-3RA55-C	1321-3R80-C	1321-3RA80-C
20DD065	Normal Duty	50	1321-3R55-C	1321-3RA55-C	1321-3R80-C	1321-3RA80-C
20DD077	Heavy Duty	50	1321-3R80-C	1321-3RA80-C	1321-3R80-C	1321-3RA80-C
20DD077	Normal Duty	60	1321-3R80-C	1321-3RA80-C	1321-3R80-C	1321-3RA80-C
20DD096	Heavy Duty	60	1321-3R80-C	1321-3RA80-C	1321-3R80-C	1321-3RA80-C
20DD096	Normal Duty	75	1321-3R100-C	1321-3RA100-C	1321-3R100-C	1321-3RA100-C
20DD125	Heavy Duty	75	1321-3R100-C	1321-3RA100-C	1321-3R100-C	1321-3RA100-C
20DD125	Normal Duty	100	1321-3R130-C	1321-3RA130-C	1321-3R130-C	1321-3RA130-C
20DD156	Heavy Duty	100	1321-3R130-C	1321-3RA130-C	1321-3R130-C	1321-3RA130-C
20DD156	Normal Duty	125	1321-3R160-C	1321-3RA160-C	1321-3R160-C	1321-3RA160-C
20DD180	Heavy Duty	125	1321-3R160-C	1321-3RA160-C	1321-3R160-C	1321-3RA160-C
20DD180	Normal Duty	150	1321-3R200-C	1321-3RA200-C	1321-3R200-C	1321-3RA200-C
20DD248	Heavy Duty	150	1321-3R200-C	1321-3RA200-C	1321-3R200-C	1321-3RA200-C
20DD248	Normal Duty	200	1321-3R250-C	1321-3RAB250-C	1321-3R250-C	1321-3RA250-C
20DD261	Normal Duty	200	1321-3RB250-C	1321-3RAB250-C	1321-3RB250-C	1321-3RAB250-C
20DD261	Heavy Duty	200	1321-3RB250-C	1321-3RAB250-C	1321-3RB250-C	1321-3RAB250-C
20DD300	Normal Duty	150	1321-3RB250-C	1321-3RAB250-C	1321-3RB250-C	1321-3RAB250-C

Notes

① Input line reactors were sized based on the NEC fundamental motor amps. Output line reactors were sized based on the VFD rated output currents.

Accessories, Cont.

Input and Output Line Reactors - 600V, 60 Hz, Three-Phase

Drive Catalog Number	Duty	HP	Input Line Reactor ^①		Output Line Reactor ^①	
			IP 00 (Open Style)	IP 11 (Nema Type 1)	IP 00 (Open Style)	IP 11 (Nema Type 1)
			Catalog Number	Catalog Number	Catalog Number	Catalog Number
3% Impedance – 600V, 60 Hz, Three-Phase						
20DDE1P7	Heavy Duty	0.5	1321-3R1-C	1321-3RA1-C	1321-3R2-B	1321-3RA2-B
20DDE1P7	Normal Duty	1	1321-3R1-B	1321-3RA1-B	1321-3R2-B	1321-3RA2-B
20DE2P7	Heavy Duty	1	1321-3R2-B	1321-3RA2-B	1321-3R4-B	1321-3RA4-B
20DE2P7	Normal Duty	2	1321-3R4-D	1321-3RA4-D	1321-3R4-D	1321-3RA4-D
20DE3P9	Heavy Duty	2	1321-3R4-D	1321-3RA4-D	1321-3R4-C	1321-3RA4-C
20DE3P9	Normal Duty	3	1321-3R4-C	1321-3RA4-C	1321-3R4-C	1321-3RA4-C
20DE6P1	Heavy Duty	3	1321-3R4-C	1321-3RA4-C	1321-3R8-C	1321-3RA8-C
20DE6P1	Normal Duty	5	1321-3R8-C	1321-3RA8-C	1321-3R8-C	1321-3RA8-C
20DE9P0	Heavy Duty	5	1321-3R8-C	1321-3RA8-C	1321-3R12-C	1321-3RA12-C
20DE9P0	Normal Duty	7.5	1321-3R12-C	1321-3RA12-C	1321-3R12-C	1321-3RA12-C
20DE011	Heavy Duty	7.5	1321-3R12-C	1321-3RA12-C	1321-3R12-B	1321-3RA12-B
20DE011	Normal Duty	10	1321-3R12-B	1321-3RA12-B	1321-3R12-B	1321-3RA12-B
20DE017	Heavy Duty	10	1321-3R12-B	1321-3RA12-B	1321-3R18-B	1321-3RA18-B
20DE017	Normal Duty	15	1321-3R18-B	1321-3RA18-B	1321-3R18-B	1321-3RA18-B
20DE022	Heavy Duty	15	1321-3R18-B	1321-3RA18-B	1321-3R25-B	1321-3RA25-B
20DE022	Normal Duty	20	1321-3R25-B	1321-3RA25-B	1321-3R25-B	1321-3RA25-B
20DE027	Heavy Duty	20	1321-3R25-B	1321-3RA25-B	1321-3R35-C	1321-3RA35-C
20DE027	Normal Duty	25	1321-3R35-C	1321-3RA35-C	1321-3R35-C	1321-3RA35-C
20DE032	Heavy Duty	25	1321-3R35-C	1321-3RA35-C	1321-3R35-B	1321-3RA35-B
20DE032	Normal Duty	30	1321-3R35-B	1321-3RA35-B	1321-3R35-B	1321-3RA35-B
20DE041	Heavy Duty	30	1321-3R35-B	1321-3RA35-B	1321-3R45-B	1321-3RA45-B
20DE041	Normal Duty	40	1321-3R45-B	1321-3RA45-B	1321-3R45-B	1321-3RA45-B
20DE052	Heavy Duty	40	1321-3R45-B	1321-3RA45-B	1321-3R55-B	1321-3RA55-B
20DE052	Normal Duty	50	1321-3R55-B	1321-3RA55-B	1321-3R55-B	1321-3RA55-B
20DE062	Heavy Duty	50	1321-3R55-B	1321-3RA55-B	1321-3R80-B	1321-3RA80-B
20DE062	Normal Duty	60	1321-3R80-B	1321-3RA80-B	1321-3R80-B	1321-3RA80-B
20DE077	Heavy Duty	60	1321-3R80-B	1321-3RA80-B	1321-3R80-B	1321-3RA80-B
20DE077	Normal Duty	75	1321-3R80-B	1321-3RA80-B	1321-3R80-B	1321-3RA80-B
20DE099	Heavy Duty	75	1321-3R80-B	1321-3RA80-B	1321-3R80-B	1321-3RA80-B
20DE099	Normal Duty	100	1321-3R100-B	1321-3RA100-B	1321-3R100-B	1321-3RA100-B
20DE125	Heavy Duty	100	1321-3R100-B	1321-3RA100-B	1321-3R100-B	1321-3RA100-B
20DE125	Normal Duty	125	1321-3R130-B	1321-3RA130-B	1321-3R130-B	1321-3RA130-B
20DE144	Heavy Duty	125	1321-3R130-B	1321-3RA130-B	1321-3R130-B	1321-3RA130-B
20DE144	Normal Duty	150	1321-3R160-B	1321-3RA160-B	1321-3R160-B	1321-3RA160-B

See page 27 for Notes.

Accessories, Cont.

Input and Output Line Reactors - 600V, 60 Hz, Three-Phase, Continued

Drive Catalog Number	Duty	HP	Input Line Reactor ^①		Output Line Reactor ^①	
			IP 00 (Open Style)	IP 11 (Nema Type 1)	IP 00 (Open Style)	IP 11 (Nema Type 1)
			Catalog Number	Catalog Number	Catalog Number	Catalog Number
5% Impedance – 600V, 60 Hz, Three-Phase						
20DDE1P7	Heavy Duty	0.5	1321-3R1-B	1321-3RA1-B	1321-3R2-C	1321-3RA2-C
20DDE1P7	Normal Duty	1	1321-3R2-C	1321-3RA2-C	1321-3R2-C	1321-3RA2-C
20DE2P7	Heavy Duty	1	1321-3R2-C	1321-3RA2-C	1321-3R4-D ^②	1321-3RA4-D ^②
20DE2P7	Normal Duty	2	1321-3R4-D ^②	1321-3RA4-D ^②	1321-3R4-D ^②	1321-3RA4-D ^②
20DE3P9	Heavy Duty	2	1321-3R4-D ^②	1321-3RA4-D ^②	1321-3R4-D	1321-3RA4-D
20DE3P9	Normal Duty	3	1321-3R4-D	1321-3RA4-D	1321-3R4-D	1321-3RA4-D
20DE6P1	Heavy Duty	3	1321-3R4-D	1321-3RA4-D	1321-3R8-D	1321-3RA8-D
20DE6P1	Normal Duty	5	1321-3R8-D	1321-3RA8-D	1321-3R8-D	1321-3RA8-D
20DE9P0	Heavy Duty	5	1321-3R8-D	1321-3RA8-D	1321-3R12-C ^②	1321-3RA12-C ^②
20DE9P0	Normal Duty	7.5	1321-3R12-C ^②	1321-3RA12-C ^②	1321-3R12-C ^②	1321-3RA12-C ^②
20DE011	Heavy Duty	7.5	1321-3R12-C ^②	1321-3RA12-C ^②	1321-3R12-C	1321-3RA12-C
20DE011	Normal Duty	10	1321-3R12-C	1321-3RA12-C	1321-3R12-C	1321-3RA12-C
20DE017	Heavy Duty	10	1321-3R12-C	1321-3RA12-C	1321-3R18-C	1321-3RA18-C
20DE017	Normal Duty	15	1321-3R18-C	1321-3RA18-C	1321-3R18-C	1321-3RA18-C
20DE022	Heavy Duty	15	1321-3R18-C	1321-3RA18-C	1321-3R25-C ^②	1321-3RA25-C ^②
20DE022	Normal Duty	20	1321-3R25-C ^②	1321-3RA25-C ^②	1321-3R25-C ^②	1321-3RA25-C ^②
20DE027	Heavy Duty	20	1321-3R25-C ^②	1321-3RA25-C ^②	1321-3R35-C ^②	1321-3RA35-C ^②
20DE027	Normal Duty	25	1321-3R35-C ^②	1321-3RA35-C ^②	1321-3R35-C ^②	1321-3RA35-C ^②
20DE032	Heavy Duty	25	1321-3R35-C ^②	1321-3RA35-C ^②	1321-3R35-C ^②	1321-3RA35-C ^②
20DE032	Normal Duty	30	1321-3R35-C ^②	1321-3RA35-C ^②	1321-3R35-C ^②	1321-3RA35-C ^②
20DE041	Heavy Duty	30	1321-3R35-C ^②	1321-3RA35-C ^②	1321-3R45-C	1321-3RA45-C
20DE041	Normal Duty	40	1321-3R45-C	1321-3RA45-C	1321-3R45-C	1321-3RA45-C
20DE052	Heavy Duty	40	1321-3R45-C	1321-3RA45-C	1321-3R55-C	1321-3RA55-C
20DE052	Normal Duty	50	1321-3R55-C	1321-3RA55-C	1321-3R55-C	1321-3RA55-C
20DE062	Heavy Duty	50	1321-3R55-C	1321-3RA55-C	1321-3R80-C	1321-3RA80-C
20DE062	Normal Duty	60	1321-3R80-C	1321-3RA80-C	1321-3R80-C	1321-3RA80-C
20DE077	Heavy Duty	60	1321-3R80-C	1321-3RA80-C	1321-3R80-C	1321-3RA80-C
20DE077	Normal Duty	75	1321-3R80-C	1321-3RA80-C	1321-3R80-C	1321-3RA80-C
20DE099	Heavy Duty	75	1321-3R80-C	1321-3RA80-C	1321-3R80-C	1321-3RA80-C
20DE099	Normal Duty	100	1321-3R100-C	1321-3RA100-C	1321-3R100-C	1321-3RA100-C
20DE125	Heavy Duty	100	1321-3R100-C	1321-3RA100-C	1321-3R100-C	1321-3RA100-C
20DE125	Normal Duty	125	1321-3R130-C ^②	1321-3RA130-C ^②	1321-3R130-C ^②	1321-3RA130-C ^②
20DE144	Heavy Duty	125	1321-3R130-C ^②	1321-3RA130-C ^②	1321-3R130-C ^②	1321-3RA130-C ^②
20DE144	Normal Duty	150	1321-3R160-C ^②	1321-3RA160-C ^②	1321-3R160-C ^②	1321-3RA160-C ^②

Notes

- ① Input line reactors were sized based on the NEC fundamental motor amps. Output line reactors were sized based on the VFD rated output currents.
- ② 4% impedance.

Accessories, Cont.

Reflected Wave Reduction

Reflected Wave Reduction Device with Common Mode Choke

Description	Used with	Catalog Number (Loose Kit)
380-600V AC, 17.5A IP20 (NEMA Type1)	3.7-7.5 kW (5-10HP)	1204-RWC-17-A

Reflected Wave Reduction Device

Description	Used with	Catalog Number (Loose Kit)
380-575V AC, 9A IP 20 (NEMA Type1)	0.37-3.7 kW (0.5-5HP) 380-460V & 500-600V A Frame Devices	1204-RWR2-09-B

Terminator

Description ①	Used with	Catalog Number (Loose Kit)
IP65 (NEMA Type4x) Connection Cable Included	0.37-1.5 kW (0.5-2HP) 460V Drives 0.75-597 kW (1-800 HP) 575V Drives	1204-TFA1
	1.5-597 kW (2-800 HP) 460V Drives 0.75-597 kW (1-800 HP) 575 Drives	1204-TFB2

- ① Correct terminator selection is dependent on motor characteristics, cable type and cable length. Refer to publication 1204-1.0 for application details before ordering.

Installation Considerations

By providing built in input MOVs (line to line and line to ground) for robust transient protection, ground fault and short circuit protection, electronic motor overload, built in noise filtering, patented reflected wave reduction software and others, the PowerFlex 700S design addresses many of the concerns in a typical installation. Below is a list of other considerations that a user may need to address.

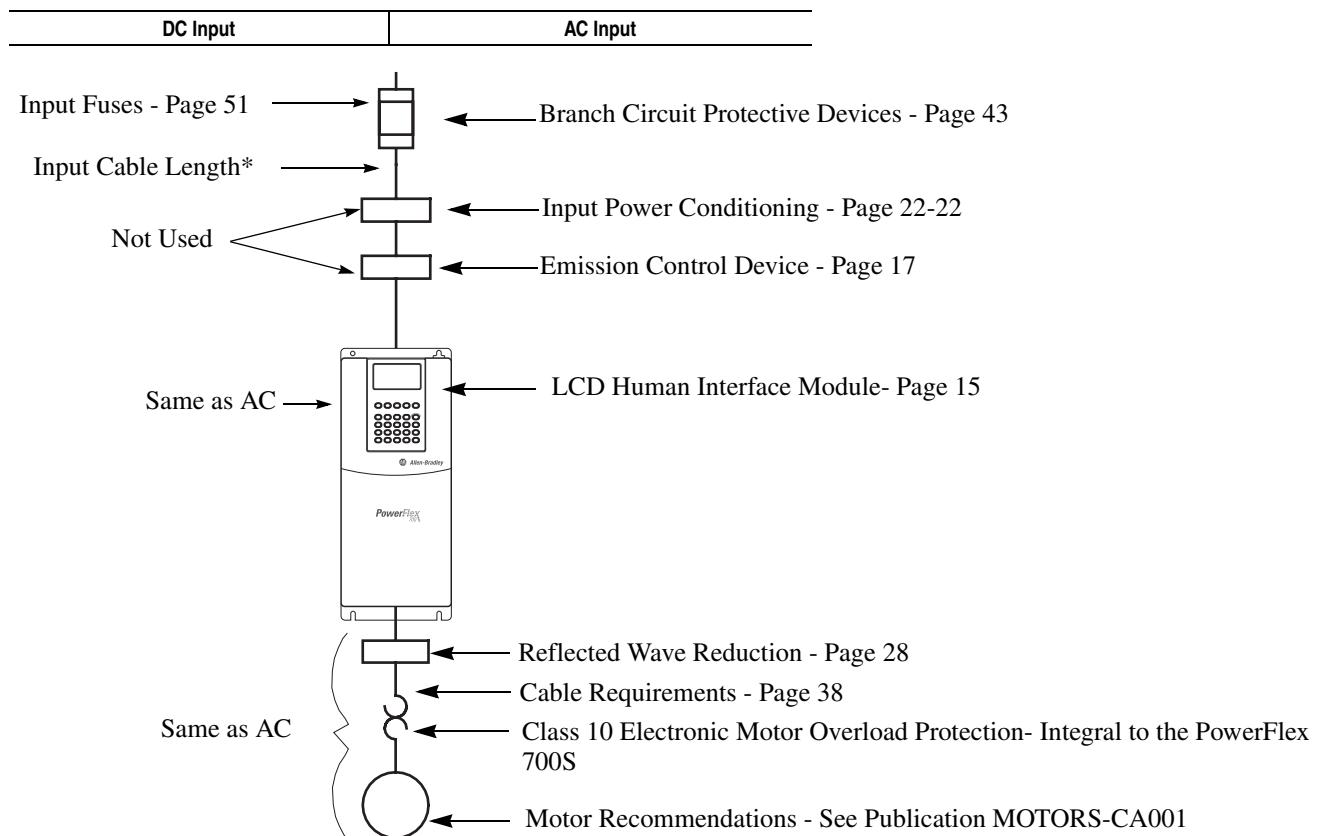
Peak Voltage Protection for Motors with Lower Insulation Systems

While the PowerFlex 700S contains the very best in reflected wave reduction techniques, some motors may have insulation systems with values well below the NEMA standards. While these motors may perform to expectations, they must be protected from the reflected wave transients that all PWM drives produce. Refer to Page 38 for cable length recommendations and Page 28 for reflected wave reduction options.

Proper Grounding and Related Noise

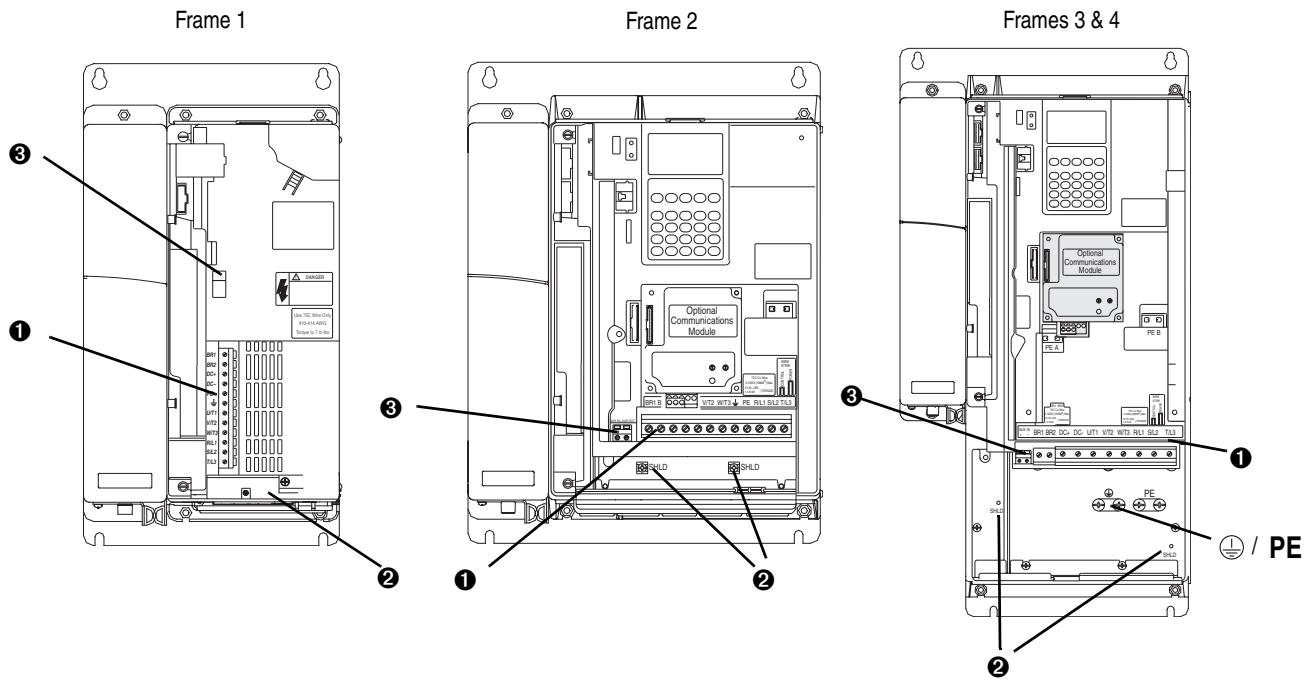
The starting point for any solid drive installation is proper grounding techniques. Most commonly observed noise problems can be easily eliminated with quality installation practices. Refer to publication DRIVES-IN001, "Wiring and Grounding Guidelines for Pulse Width Modulated (PWM) AC Drives" for complete information.

The block diagram below also provides direction on other installation issues and concerns.



* Input Cable Length is limited. See Publication 20D-UM001 for further details.

Power Terminal Block Locations, Frames 1 - 4



Power Terminal Block Specifications, Frames 1 - 4

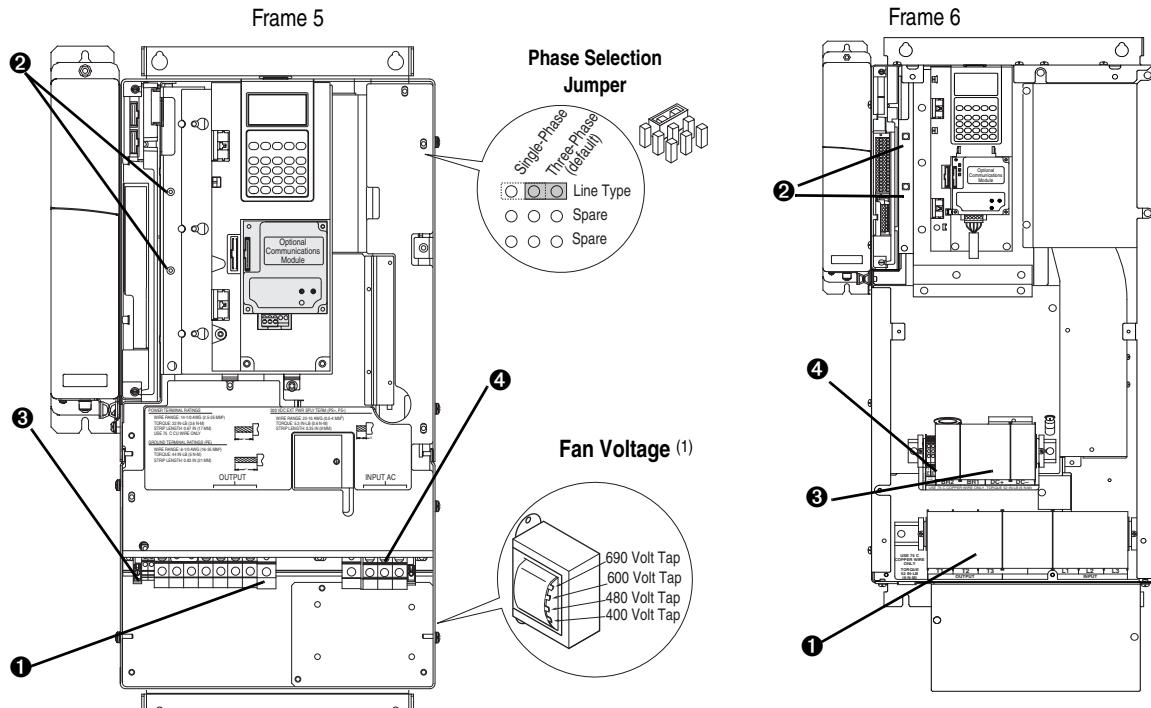
No.	Name	Frame	Description	Wire Size Range(1)		Torque Maximum	Recommended	Terminal Bolt Size(2)
				Maximum	Minimum			
①	Power Terminal Block	1	Input power and motor connections	4.0 mm ² (10 AWG)	0.5 mm ² (22 AWG)	1.7 N-m (15 lb.-in.)	0.8 N-m (7 lb.-in.)	—
		2	Input power and motor connections	10.0 mm ² (6 AWG)	0.8 mm ² (18 AWG)	1.7 N-m (15 lb.-in.)	1.4 N-m (12 lb.-in.)	—
		3	Input power and motor connections	25.0 mm ² (3 AWG)	2.5 mm ² (14 AWG)	3.6 N-m (32 lb.-in.)	1.8 N-m (16 lb.-in.)	—
			BR1, BR2	10.0 mm ² (6 AWG)	0.8 mm ² (18 AWG)	1.7 N-m (15 lb.-in.)	1.4 N-m (12 lb.-in.)	—
		4	Input power and motor connections	35.0 mm ² (1/0 AWG)	10 mm ² (8 AWG)	4.0 N-m (24 lb.-in.)	4.0 N-m (24 lb.-in.)	—
②	SHLD Terminal	1-4	Terminating point for wiring shields	—	—	1.6 N-m (14 lb.-in.)	1.6 N-m (14 lb.-in.)	—
③	AUX Terminal Block	1-4	Auxiliary Control Voltage (3) PS+, PS-	1.5 mm ² (16 AWG)	0.2 mm ² (24 AWG)	—	—	—

(1) Maximum/minimum sizes that the terminal block will accept - these are not recommendations.

(2) Apply counter torque to the nut on the other side of terminations when tightening or loosening the terminal bolt in order to avoid damage to the terminal.

(3) External control power: UL Installation - 300V DC, ±10%, Non UL Installation - 270-600V DC, ±10%. Frame 1-6, 100 W

Power and Fan Terminal Block Locations, Frames 5 & 6



Fan VA Rating - Common Bus Only

Frame	Fan Voltage (120V or 240V)
5	100 VA
6	138 VA

(1) Frame 5 & 6 utilize a transformer to match the input line voltage to the internal fan voltage. If your line voltage is different than the voltage class specified on the drive nameplate, it may be necessary to change the transformer taps. The taps are shown in the inserts of frames 5 & 6.

Common Bus drives require user supplied 120V or 240V to power the cooling fans. Power source is connected between "0V AC" and the terminal corresponding to your source voltage (see common bus terminal blocks, page 35).

Power Terminal Specifications, Frames 5 & 6

No.	Name	Frame	Description	Wire Size Range(1)		Torque		Terminal Bolt Size(2)
				Maximum	Minimum	Maximum	Recommended	
①	Power Terminal Block	5 (75 HP) ⁽³⁾	R, S, T, BR1, 2, DC+, DC-, U, V and W	50.0 mm ² (1/0 AWG)	2.5 mm ² (14 AWG)	See Note (4)	See Note (4)	—
			PE	50.0 mm ² (1/0 AWG)	4.0 mm ² (12 AWG)			—
		5 (100 HP) ⁽³⁾	R, S, T, DC+, DC-, U, V and W	70.0 mm ² (2/0 AWG)	16.0 mm ² (6 AWG)			—
	BR1, BR2		BR1, BR2	50.0 mm ² (1/0 AWG)	2.5 mm ² (14 AWG)			—
			PE	50.0 mm ² (1/0 AWG)	4.0 mm ² (12 AWG)			—
	6		Input power and motor connections	120.0 mm ² (4/0 AWG)	2.5 mm ² (14 AWG)	6 N-m (52 lb.-in.)	6 N-m (52 lb.-in.)	—
②	SHLD Terminal	5 & 6	Terminating point for wiring shields	—	—	1.6 N-m (14 lb.-in.)	1.6 N-m (14 lb.-in.)	—
③	AUX Terminal Block	5 & 6	Auxiliary Control Voltage ⁽⁵⁾ PS+, PS-	4.0 mm ² (10 AWG)	0.5 mm ² (22 AWG)	0.6 N-m (5.3 lb.-in.)	0.6 N-m (5.3 lb.-in.)	—
④	Fan Terminal Block (Common Bus Only)	5 & 6	User Supplied Fan Voltage 0V AC, 120V AC, 240V AC	4.0 mm ² (10 AWG)	0.5 mm ² (22 AWG)	0.6 N-m (5.3 lb.-in.)	0.6 N-m (5.3 lb.-in.)	—

(1) Maximum/minimum sizes that the terminal block will accept - these are not recommendations.

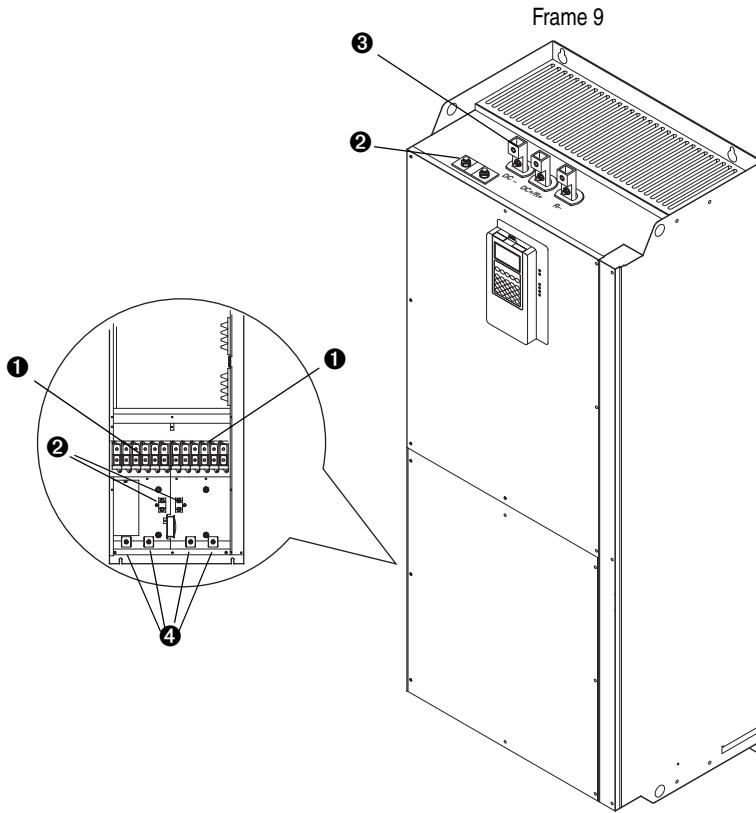
(2) Apply counter torque to the nut on the other side of terminations when tightening or loosening the terminal bolt in order to avoid damage to the terminal.

(3) Not all terminals present on all drives.

(4) Refer to the terminal block label inside the drive.

(5) External control power: UL Installation - 300V DC, ±10%, Non UL Installation - 270-600V DC, ±10%. Frame 1-6, 100 W

Power Terminal Block Locations, Frame 9



Power Terminal Block Specifications, Frame 9

No.	Name	Frame	Description	Wire Size Range(1)		Torque		Terminal Bolt Size(2)
				Maximum	Minimum	Maximum	Recommended	
①	Power Terminal Block	9 (3)	Input Power — L1, L2, L3 Motor Connections — U/T1, V/T2, W/T3	185.0 mm ² 350 MCM	95.0 mm ² 4/0 AWG	40 N-m (340 lb.-in.)	40 N-m (340 lb.-in.)	—
②	SHLD Terminal	9	Terminating point for wiring shields	95.0 mm ² 4/0 AWG	5.0 mm ² 10 AWG	22 N-m (187 lb.-in.)	22 N-m (187 lb.-in.)	—
③	DC Bus (2 Terminals)	9 (4)	DC input or external brake <i>(Internal Brake option not ordered)</i>	185.0 mm ² 350 MCM	95.0 mm ² 4/0 AWG	40 N-m (340 lb.-in.)	40 N-m (340 lb.-in.)	—
	DC Bus w/Brake (3 Terminals)	9 (4)	DC input/internal brake <i>(Internal Brake option is ordered)</i>	185.0 mm ² 350 MCM	95.0 mm ² 4/0 AWG	40 N-m (340 lb.-in.)	40 N-m (340 lb.-in.)	—
④	Cable Clamp	9	Cable Clamp for Strain Relief					—

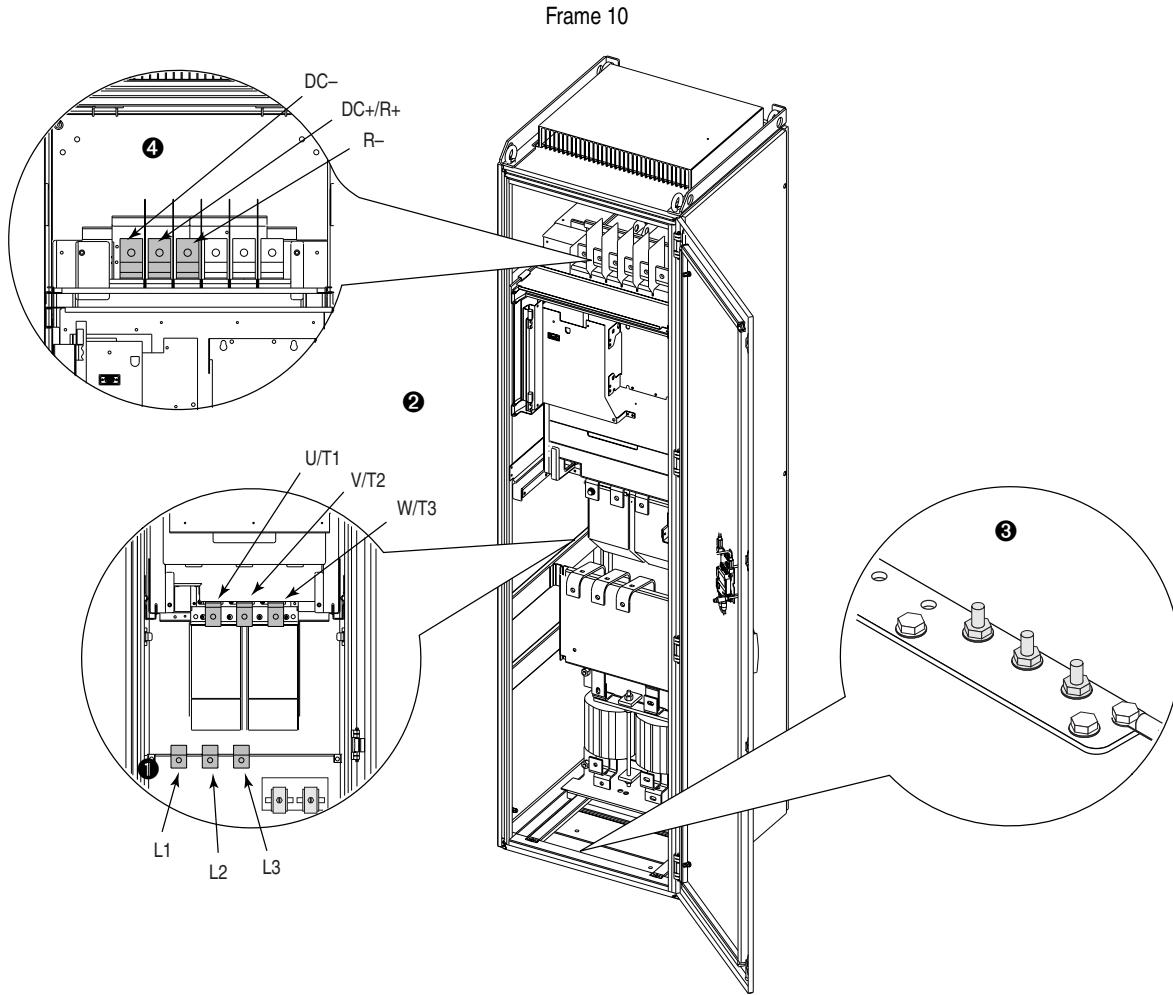
(1) Maximum/minimum sizes that the terminal block will accept - these are not recommendations.

(2) Apply counter torque to the nut on the other side of terminations when tightening or loosening the terminal bolt in order to avoid damage to the terminal.

(3) Do Not exceed maximum wire size. Parallel connections may be required.

(4) DC terminal and brake lugs can be removed.

Power Terminal Block Locations, Frame 10



Power Terminal Block Specifications, Frame 10

No.	Name	Description	Wire Size Range (1) (2)		Torque	Terminal Bolt Size (3) (4)
			Maximum	Minimum		
①	Input Power Terminal Block L1, L2, L3 (3)	Input power	300 mm ² (600 MCM)	2.1 mm ² (14 AWG)	40 N-m (354 lb.-in.)	M12
②	Output Power Terminal Block (3) U/T1, V/T2, W/T3	Motor connections	300 mm ² (600 MCM)	2.1 mm ² (14 AWG)	40 N-m (354 lb.-in.)	M12
③	SHLD Terminal, PE, Motor Ground (3)	Terminating point for wiring shields	300 mm ² (600 MCM)	2.1 mm ² (14 AWG)	40 N-m (354 lb.-in.)	M10
④	DC Bus (3) (2 Terminals; DC-, DC+)	DC input or external brake <i>(Internal Brake option not ordered)</i>	300 mm ² (600 MCM)	2.1 mm ² (14 AWG)	40 N-m (354 lb.-in.)	M12
	DC Bus w/Brake (3) (3 Terminals; DC-, DC+/R+, R-)	DC input/internal brake <i>(Internal Brake option is ordered)</i>	300 mm ² (600 MCM)	2.1 mm ² (14 AWG)	40 N-m (354 lb.-in.)	M12

(1) Maximum/minimum sizes that the terminal block will accept - these are not recommendations.

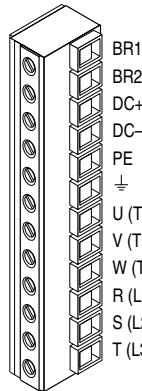
(2) Do Not exceed maximum wire size. Parallel connections may be required.

(3) These connections are bus bar type terminations and require the use of lug type connectors.

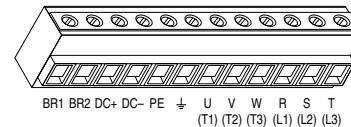
(4) Apply counter torque to the nut on the other side of terminations when tightening or loosening the terminal bolt in order to avoid damage to the terminal.

Power Terminal Blocks, Cont.

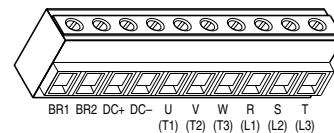
Frame 1



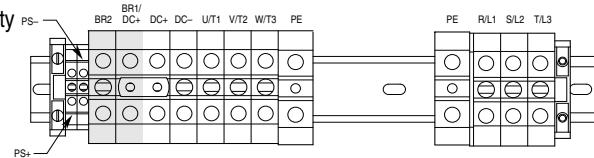
Frame 2



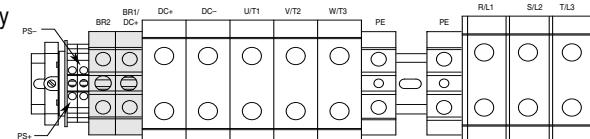
Frames 3 & 4



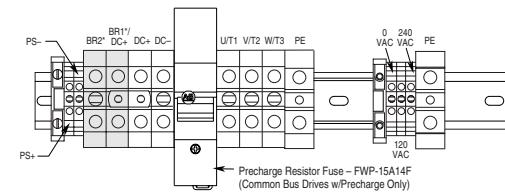
Frame 5 - 75 HP Normal Duty
480V AC Input



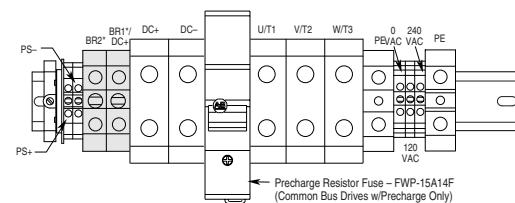
Frame 5 - 100 HP Normal Duty
480V AC Input



Frame 5 - 75 HP Normal Duty
650V DC Input



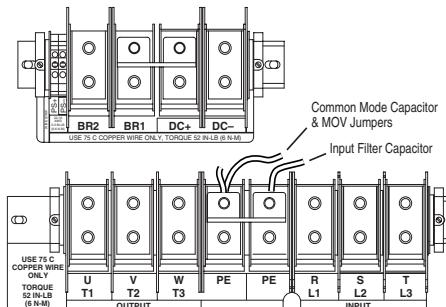
Frame 5 - 100 HP Normal Duty
650V DC Input



Power Terminal Blocks, Cont.

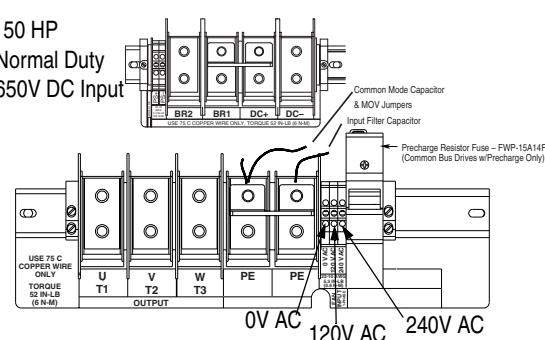
Frame 6 - 150 HP

Normal Duty
480V AC Input



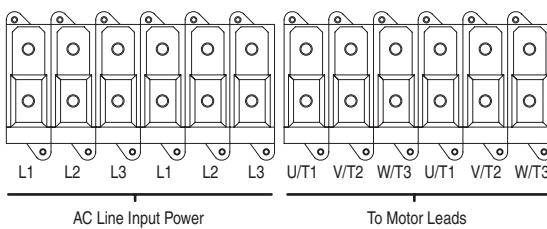
Frame 6 - 150 HP

Normal Duty
650V DC Input



Terminals BR1 & BR2 will only be present on drives ordered with the Brake Option.

Frame 9



Terminal	Description	Notes
BR1	DC Brake (+)	Dynamic Brake Resistor Connection (+)
BR2	DC Brake (-)	Dynamic Brake Resistor Connection (-)
DC+	DC Bus (+)	DC Input Power or Dynamic Brake Chopper
DC-	DC Bus (-)	DC Input Power or Dynamic Brake Chopper
PE	PE Ground	Not present on 3 Frame drives
\pm	Motor Ground	Not present on 3 Frame drives
PS+	Aux +	①
PS-	Aux -	①
U	U (T1)	To motor
V	V (T2)	To motor
W	W (T3)	To motor
R	R (L1)	AC Line Input Power
S	S (L2)	AC Line Input Power
T	T (L3)	AC Line Input Power

① External control power:

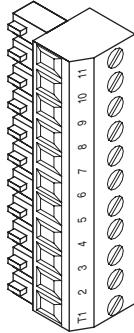
UL Installation - 300V DC, $\pm 10\%$, Non UL Installation - 270-600V DC, $\pm 10\%$.

1-3 Frame - 40 W, 165 mA, 5 Frame - 80 W, 90 mA

Control Terminals

TB1 - Row T (Top) Terminal

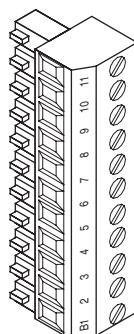
Terminal	Signal	Description	Related Parameter
T11	Power Supply 24V DC Return (-)		
T10	Power Supply 24V DC(+)		
T9	Logic Common		
T8	Digital Input #1 Default = Precharge	For common DC bus drives. Must be high, for drive to complete the precharge cycle. Load: 20 mA at 24V DC.	824, 826, 827, 828, 829, 838,
T7	Enable Input	Must be high for drive to run. Load: 20 mA at 24V DC.	824, 825
T6	Digital Output #1	24V DC open collector (sinking logic) output. Rating: 25 mA maximum.	824, 843, 844
T5	Digital Output #2	24V DC open collector (sinking logic) output. Rating: 25 mA maximum.	824, 845, 846
T4	Digital Output Return	Return for Digital outputs 1 and 2.	
T3	Thermistor Input	Used only in FOC2 mode with approved motor for temperature adaptation.	
T2	Thermistor Input Return		
T1	Thermistor Shield		485



- ① The drive's 24V DC power supply supports only on-board digital inputs. Do not use to power circuits outside of the drive.
- ② Refer to wiring examples of sinking and sourcing output.

TB1 - Row B (Bottom) Terminal

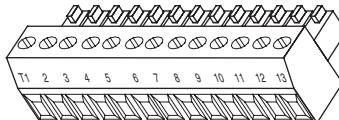
Terminal	Signal	Description	Related Parameter
B11	Analog Input #1 (-)	+/-10.0V DC or +/-1.0V DC bipolar, differential input ①, 13 bit + sign, 20k Ohm input impedance	800, 801, 802, 803, 804, 805
B10	Analog Input #1 (+)		
B9	Analog Input Shield	Optional connection point for analog input shield. ②	
B8	Analog Input #2 (-)	+/-10.0V DC or +/-1.0V DC bipolar, differential input ①, 13 bit + sign, 20k Ohm input impedance	806, 807, 808, 809, 810, 811
B7	Analog Input #2 (+)		
B6	Analog Output #1 (+)	+/-10.0VDC bipolar, differential output, 11 bit + sign, 2k Ohm minimum load	812, 814, 815, 816, 817, 818
B5	Analog Output #1 Return (-)		
B4	Analog Output Shield	Optional connection point for analog output shield. ②	
B3	Analog Output #2 (+)	+/-10.0V DC bipolar, differential output, 11 bit + sign, 2k Ohm minimum load	813, 819, 820, 821, 822, 823
B2	Analog Output #2 Return (-)		
B1	Analog Output Shield	Optional connection point for analog shields.	



- ① Refer to Analog Input Settings in the *PowerFlex 700S User Manual* for necessary DIP switch settings.
- ② Analog shields should connect to common at the signal switch, if possible. Shields for signals from ungrounded devices, such as analog tachometers, should connect to an analog shield terminal point at the drive.

Control Terminals Cont.

TB2 - Row T (Top) Terminals

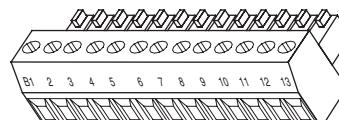


Terminal	Signal	Description	Related Parameter
T13	Encoder Signal A		
T12	Encoder Signal Not A		
T11	Encoder Signal B		
T10	Encoder Signal Not B		
T9	Encoder Signal Z		
T8	Encoder Signal Not Z		
T7	Shield	Connection point for encoder shield.	
T6	Digital Input #2	High speed 12-24V DC sinking digital input.	829, 830, 831, 832, 833, 839
T5	Digital Input #2 Return		
T4	Digital Input #3	High speed 12-24V DC sinking digital input.	824, 834, 835, 836, 837, 840
T3	Digital Input #3 Return		
T2	Power Supply +12V DC (A) (+)	12V DC power supply for primary encoder interface and high speed inputs. Rating 300 mA. ②	
T1	Power Supply +12V DC Return (A) (-)		

① Refer to Encoder Input Settings in the *PowerFlex 700S User Manual* for necessary DIP switch settings.

② This power supply supports only the primary encoder interface and digital inputs. Do not use it to power circuits outside of the drive.

TB2 - Row B (Bottom) Terminals



Terminal	Signal	Description	Related Parameter
B13	Encoder Signal A		
B12	Encoder Signal Not A		
B11	Encoder Signal B		
B10	Encoder Signal Not B		
B9	Encoder Signal Z		
B8	Encoder Signal Not Z		
B7	Shield	Connection point for encoder shield.	
B6	Unused		
B5	Relay Output	Relay contact output.	824, 841, 842
B4	Relay Output Return	Rating: 5A @ 24V DC Resistive, 2A 24VDC Inductive	
B3	Unused		
B2	Power Supply +12V dc (B) (+)	12V DC power supply for secondary encoder interface.	
B1	Power Supply +12V dc Return (B) (-)	Rating 300 mA. ②	

① Refer to Encoder Input Settings in the *PowerFlex 700S User Manual* for necessary DIP switch settings.

② This power supply supports only the primary encoder interface and digital inputs. Do not use it to power circuits outside of the drive.

Cable Recommendations — Power

Unshielded Cable

THHN, THWN or similar wire is acceptable for drive installation in dry environments provided adequate free air space and/or conduit fill rates limits are provided. **Do not use THHN or similarly coated wire in wet areas.** Any wire chosen must have a minimum insulation thickness of 15 Mils and should not have large variations in insulation concentricity.

Shielded Cable

Shielded cable contains all of the general benefits of multi-conductor cable with the added benefit of a copper braided shield that can contain much of the noise generated by a typical AC Drive. Strong consideration for shielded cable should be given in installations with sensitive equipment such as weigh scales, capacitive proximity switches and other devices that may be affected by electrical noise in the distribution system. Applications with large numbers of drives in a similar location, imposed EMC regulations or a high degree of communications/ networking are also good candidates for shielded cable.

Shielded cable may also help reduce shaft voltage and induced bearing currents for some applications. In addition, the increased impedance of shielded cable may help extend the distance that the motor can be located from the drive without the addition of motor protective devices such as terminator networks. Refer to *Reflected Wave* in “Wiring and Grounding Guidelines for PWM AC Drives,” publication DRIVES-IN001x.

Consideration should be given to all of the general specifications dictated by the environment of the installation, including temperature, flexibility, moisture characteristics and chemical resistance. In addition, a braided shield should be included and be specified by the cable manufacturer as having coverage of at least 75%. An additional foil shield can greatly improve noise containment.

A good example of recommended cable is Belden® 295xx (xx determines gauge). This cable has four (4) XLPE insulated conductors with a 100% coverage foil and an 85% coverage copper braided shield (with drain wire) surrounded by a PVC jacket.

Other types of shielded cable are available, but the selection of these types may limit the allowable cable length. Particularly, some of the newer cables twist 4 conductors of THHN wire and wrap them tightly with a foil shield. This construction can greatly increase the cable charging current required and reduce the overall drive performance. Unless specified in the individual distance tables as tested with the drive, these cables are not recommended and their performance against the lead length limits supplied is not known.

Armored Cable

Cable with continuous aluminum armor is often recommended in drive system applications or specific industries. It offers most of the advantages of standard shielded cable and also combines considerable mechanical strength and resistance to moisture. It can be installed in concealed and exposed manners and removes the requirement for conduit (EMT) in the installation. It can also be directly buried or embedded in concrete.

Because noise containment can be affected by incidental grounding of the armor to building steel (see Chapter 2. “Wire Types,” of publication DRIVES-IN001, *Wiring and Grounding Guidelines for Pulse Width Modulated (PWM) AC Drives*) when the cable is mounted, it is recommended the armored cable have an overall PVC jacket.

Interlocked armor is acceptable for shorter cable runs, but continuous welded armor is preferred.

Best performance is achieved with 3 spaced ground conductors, but acceptable performance below 200 HP is provided via a single ground conductor.

Cable Recommendations — Power, Cont.

Table 1.A Recommended Shielded/Armored Cable

Location	Rating/Type	Description
Standard (Option 1)	600V, 90°C (194°F) XHHW2/RHW-2 Anixter B209500-B209507, Belden 29501-29507, or equivalent	<ul style="list-style-type: none"> Four tinned copper conductors with XLPE insulation. Copper braid/aluminum foil combination shield and tinned copper drain wire. PVC jacket.
Standard (Option 2)	Tray rated 600V, 90°C (194°F) RHH/RHW-2 Anixter OLF-7xxxx or equivalent	<ul style="list-style-type: none"> Three tinned copper conductors with XLPE insulation. 5 mil single helical copper tape (25% overlap min.) with three bare copper grounds in contact with shield. PVC jacket.
Class I & II; Division I & II	Tray rated 600V, 90°C (194°F) RHH/RHW-2 Anixter 7V-7xxxx-3G or equivalent	<ul style="list-style-type: none"> Three bare copper conductors with XLPE insulation and impervious corrugated continuously welded aluminum armor. Black sunlight resistant PVC jacket overall. Three copper grounds on #10 AWG and smaller.

Cable Recommendations - Control

Signal Type	Wire Type(s)	Description
Standard Analog I/O	Belden 8760/9640 (or equiv.)	750 mm ² (18 AWG), twisted pair, 100% shield with drain
	Belden 8770 (or equiv.)	0.750 mm ² (18 AWG), 3 cond., shielded for remote pot only
Encoder Pulse I/O	Less than or equal to 30 m (98ft.) Belden 9730 (or equiv.)	0.196 mm ² (24 AWG), individually shielded
	Greater than 30 m (98ft.) Belden 9773 (or equiv.)	0.750 mm ² (18 AWG), twisted pair, shielded
Stegmann Encoder	Stegmann 6-411682-xx cables with C12 FUR connections	
Resolver	Paige 412081 (or equiv.) Twist, capacitance, inductance and resistance specifications equal to or greater than cable specified	0.750 =mm ² (18 AWG), twisted pair, 300V, 80° C (176° F) minimum
SynchLink	Versalink V-System Lucent Technologies Specialty Fibers Technology Division 1403-CF BLK	200/230 micron HCS (Hard Clad Silica) 650 nm (Red) Data Rate 5 Mbps
EMC Compliance	Refer to "Product Selector" on Page 13 for details	

Cable Length Restrictions

400V Shielded/Unshielded Cable - Meters (Feet)

Drive			No Solution				Reactor Only				Reactor + Damping Resistor			
Frame	kW	kHz	1000V	1200V	1488V	1600V	1000V	1200V	1488V	1600V	1000V	1200V	1488V	1600V
1	0.37	2/4	7.6 (25)	*	*	*	*	*	*	*	*	*	*	*
	0.75	2/4	7.6 (25)	*	*	*	*	*	*	*	*	*	*	*
	1.5	2/4	7.6 (25)	*	*	*	*	*	*	*	*	*	*	*
	2.2	2/4	7.6 (25)	*	*	*	*	*	*	*	*	*	*	*
	4	2/4	7.6 (25)	*	*	*	*	*	*	*	*	*	*	*
	5.5	2/4	7.6 (25)	*	*	*	*	*	*	*	*	*	*	*
	7.5	2/4	7.6 (25)	*	*	*	*	*	*	*	*	*	*	*
	11	2/4	7.6 (25)	106.9 (350)	274.3 (900)	365.8 (1200)	91.4 (300)	274.3 (900)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	2	15	2/4	7.6 (25)	106.9 (350)	274.3 (900)	365.8 (1200)	91.4 (300)	274.3 (900)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)
		18.5	2/4	7.6 (25)	106.9 (350)	274.3 (900)	365.8 (1200)	91.4 (300)	274.3 (900)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)
3	22	2/4	7.6 (25)	106.9 (350)	274.3 (900)	365.8 (1200)	91.4 (300)	274.3 (900)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	30	2/4	7.6 (25)	106.9 (350)	274.3 (900)	365.8 (1200)	91.4 (300)	274.3 (900)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	37	2/4	12.2 (40)	91.4 (300)	274.3 (900)	365.8 (1200)	76.2 (250)	243.8 (800)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)
4	45	2/4	12.2 (40)	106.9 (350)	274.3 (900)	365.8 (1200)	76.2 (250)	304.8 (1000)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)
5	55	2/4	12.2 (40)	106.9 (350)	274.3 (900)	365.8 (1200)	61.0 (200)	274.3 (900)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	75	2/4	18.3 (60)	91.4 (300)	213.4 (700)	304.8 (1000)	45.7 (150)	243.8 (800)	365.8 (1200)	365.8 (1200)	304.8 (1000)	365.8 (1200)	365.8 (1200)	365.8 (1200)
6	90	2/4	18.3 (60)	91.4 (300)	213.4 (700)	304.8 (1000)	45.7 (150)	213.4 (700)	365.8 (1200)	365.8 (1200)	304.8 (1000)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	110	2/4	24.4 (80)	91.4 (300)	213.4 (700)	274.3 (900)	45.7 (150)	182.9 (600)	365.8 (1200)	365.8 (1200)	274.3 (900)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	132	2/4	24.4 (80)	91.4 (300)	182.9 (600)	243.8 (800)	45.7 (150)	152.4 (500)	365.8 (1200)	365.8 (1200)	243.8 (800)	365.8 (1200)	365.8 (1200)	365.8 (1200)
9	132	2	24.4 (80)	91.4 (300)	182.9 (600)	243.8 (800)	45.7 (150)	152.4 (500)	365.8 (1200)	365.8 (1200)	243.8 (800)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	160	2	24.4 (80)	91.4 (300)	152.4 (500)	213.4 (700)	45.7 (150)	121.9 (400)	365.8 (1200)	365.8 (1200)	243.8 (800)	365.8 (1200)	365.8 (1200)	365.8 (1200)
10	200	2	24.4 (80)	76.2 (250)	121.9 (400)	182.9 (600)	36.6 (120)	91.4 (300)	304.8 (1000)	365.8 (1200)	243.8 (800)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	250	2	24.4 (80)	76.2 (250)	99.1 (325)	167.6 (550)	36.6 (120)	76.2 (250)	304.8 (1000)	365.8 (1200)	228.6 (750)	335.3 (1100)	365.8 (1200)	365.8 (1200)

* Maximum cable length is limited due to cable charging characteristics.

Cable Length Restrictions, Cont.

480V Shielded/Unshielded Cable - Meters (Feet)

Drive			No Solution				Reactor Only				Reactor + Damping Resistor			
Frame	HP	kHz	1000V	1200V	1488V	1600V	1000V	1200V	1488V	1600V	1000V	1200V	1488V	1600V
1	0.5	2/4	7.6 (25)	12.2 (40)	*	*	7.6 (25)	*	*	*	*	*	*	*
	1	2/4	7.6 (25)	12.2 (40)	*	*	7.6 (25)	*	*	*	*	*	*	*
	2	2/4	7.6 (25)	12.2 (40)	*	*	7.6 (25)	*	*	*	*	*	*	*
	3	2/4	7.6 (25)	12.2 (40)	*	*	7.6 (25)	*	*	*	*	*	*	*
	5	2/4	7.6 (25)	12.2 (40)	*	*	7.6 (25)	*	*	*	*	*	*	*
	7.5	2/4	7.6 (25)	12.2 (40)	*	*	7.6 (25)	*	*	*	*	*	*	*
	10	2/4	7.6 (25)	12.2 (40)	*	*	7.6 (25)	*	*	*	*	*	*	*
	15	2/4	7.6 (25)	12.2 (40)	106.9 (350)	152.4 (500)	7.6 (25)	91.4 (300)	365.8 (1200)	365.8 (1200)	152.4 (500)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	20	2/4	7.6 (25)	12.2 (40)	106.9 (350)	152.4 (500)	7.6 (25)	91.4 (300)	365.8 (1200)	365.8 (1200)	182.9 (600)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	25	2/4	7.6 (25)	12.2 (40)	106.9 (350)	152.4 (500)	7.6 (25)	76.2 (250)	365.8 (1200)	365.8 (1200)	152.4 (500)	365.8 (1200)	365.8 (1200)	365.8 (1200)
3	30	2/4	7.6 (25)	12.2 (40)	106.9 (350)	152.4 (500)	7.6 (25)	76.2 (250)	365.8 (1200)	365.8 (1200)	152.4 (500)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	40	2/4	7.6 (25)	12.2 (40)	106.9 (350)	152.4 (500)	7.6 (25)	76.2 (250)	365.8 (1200)	365.8 (1200)	121.9 (400)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	50	2/4	12.2 (40)	18.3 (60)	106.9 (350)	152.4 (500)	12.2 (40)	61.0 (200)	304.8 (1000)	365.8 (1200)	121.9 (400)	365.8 (1200)	365.8 (1200)	365.8 (1200)
4	60	2/4	12.2 (40)	18.3 (60)	91.4 (300)	152.4 (500)	12.2 (40)	61.0 (200)	304.8 (1000)	365.8 (1200)	91.4 (300)	365.8 (1200)	365.8 (1200)	365.8 (1200)
5	75	2/4	12.2 (40)	18.3 (60)	91.4 (300)	152.4 (500)	12.2 (40)	61.0 (200)	274.3 (900)	365.8 (1200)	91.4 (300)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	100	2/4	12.2 (40)	24.4 (80)	91.4 (300)	137.2 (450)	12.2 (40)	61.0 (200)	243.8 (800)	365.8 (1200)	91.4 (300)	365.8 (1200)	365.8 (1200)	365.8 (1200)
6	125	2/4	12.2 (40)	24.4 (80)	91.4 (300)	137.2 (450)	12.2 (40)	61.0 (200)	243.8 (800)	365.8 (1200)	76.2 (250)	304.8 (1000)	365.8 (1200)	365.8 (1200)
	150	2/4	12.2 (40)	24.4 (80)	91.4 (300)	137.2 (450)	12.2 (40)	61.0 (200)	243.8 (800)	304.8 (1000)	76.2 (250)	274.3 (900)	365.8 (1200)	365.8 (1200)
	200	2/4	12.2 (40)	30.5 (100)	91.4 (300)	137.2 (450)	12.2 (40)	61.0 (200)	243.8 (800)	304.8 (1000)	61.0 (200)	274.3 (900)	365.8 (1200)	365.8 (1200)
9	200	2	12.2 (40)	30.5 (100)	91.4 (300)	152.4 (500)	12.2 (40)	45.7 (150)	152.4 (500)	228.6 (750)	61.0 (200)	274.3 (900)	365.8 (1200)	365.8 (1200)
	250	2	12.2 (40)	30.5 (100)	91.4 (300)	152.4 (500)	12.2 (40)	45.7 (150)	121.9 (400)	182.9 (600)	61.0 (200)	243.8 (800)	365.8 (1200)	365.8 (1200)
10	300	2	12.2 (40)	30.5 (100)	61.0 (200)	121.9 (400)	12.2 (40)	45.7 (150)	61.0 (200)	121.9 (400)	61.0 (200)	243.8 (800)	304.8 (1000)	365.8 (1200)
	350	2	12.2 (40)	30.5 (100)	61.0 (200)	121.9 (400)	12.2 (40)	45.7 (150)	61.0 (200)	121.9 (400)	61.0 (200)	243.8 (800)	304.8 (1000)	365.8 (1200)
	400	2	12.2 (40)	30.5 (100)	61.0 (200)	121.9 (400)	12.2 (40)	45.7 (150)	61.0 (200)	121.9 (400)	61.0 (200)	213.4 (700)	304.8 (1000)	365.8 (1200)
	450	2	12.2 (40)	30.5 (100)	61.0 (200)	121.9 (400)	12.2 (40)	45.7 (150)	61.0 (200)	121.9 (400)	61.0 (200)	213.4 (700)	304.8 (1000)	365.8 (1200)

* Maximum cable length is limited due to cable charging characteristics.

Cable Length Restrictions, Cont.

600V Shielded/Unshielded Cable - Meters (Feet)

Drive			No Solution		Reactor Only		Reactor + Damping Resistor	
Frame	HP	kHz	1488V	1850V	1488V	1850V	1488V	1850V
1	1	2/4	30.5 (100)	*	*	*	*	*
	2	2/4	30.5 (100)	*	*	*	*	*
	3	2/4	30.5 (100)	*	*	*	*	*
	5	2/4	30.5 (100)	*	*	*	*	*
	7.5	2/4	30.5 (100)	*	*	*	*	*
	10	2/4	30.5 (100)	*	*	*	*	*
	15	2/4	30.5 (100)	152.4 (500)	121.9 (400)	365.8 (1200)	365.8 (1200)	365.8 (1200)
2	20	2/4	30.5 (100)	152.4 (500)	121.9 (400)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	25	2/4	30.5 (100)	152.4 (500)	121.9 (400)	365.8 (1200)	365.8 (1200)	365.8 (1200)
3	30	2/4	30.5 (100)	152.4 (500)	121.9 (400)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	40	2/4	30.5 (100)	152.4 (500)	121.9 (400)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	50	2/4	36.6 (120)	152.4 (500)	121.9 (400)	365.8 (1200)	365.8 (1200)	365.8 (1200)
4	60	2/4	36.6 (120)	152.4 (500)	121.9 (400)	365.8 (1200)	365.8 (1200)	365.8 (1200)
5	75	2/4	36.6 (120)	152.4 (500)	121.9 (400)	365.8 (1200)	365.8 (1200)	365.8 (1200)
	100	2/4	42.7 (140)	152.4 (500)	121.9 (400)	304.8 (1000)	365.8 (1200)	365.8 (1200)
6	125	2/4	42.7 (140)	152.4 (500)	121.9 (400)	304.8 (1000)	365.8 (1200)	365.8 (1200)
	150	2/4	42.7 (140)	152.4 (500)	121.9 (400)	304.8 (1000)	365.8 (1200)	365.8 (1200)
9	150	2	42.7 (140)	152.4 (500)	61.0 (200)	304.8 (1000)	365.8 (1200)	365.8 (1200)
	200	2	42.7 (140)	152.4 (500)	61.0 (200)	304.8 (1000)	365.8 (1200)	365.8 (1200)
10	250	2	42.7 (140)	152.4 (500)	61.0 (200)	304.8 (1000)	365.8 (1200)	365.8 (1200)
	350	2	42.7 (140)	152.4 (500)	61.0 (200)	304.8 (1000)	365.8 (1200)	365.8 (1200)
	400	2	42.7 (140)	152.4 (500)	61.0 (200)	304.8 (1000)	365.8 (1200)	365.8 (1200)

* Maximum cable length is limited due to cable charging characteristics.

690V Shielded/Unshielded Cable - Meters (Feet)

Drive			No Solution		Reactor Only		Reactor + Damping Resistor	
Frame	kW	kHz	1850V	2000V	1850V	2000V	1850V	2000V
4	45	2/4	30.5 (100)	76.2 (250)	91.4 (300)	152.4 (500)	365.8 (1200)	365.8 (1200)
	55	2/4	30.5 (100)	76.2 (250)	91.4 (300)	152.4 (500)	365.8 (1200)	365.8 (1200)
5	75	2/4	30.5 (100)	76.2 (250)	91.4 (300)	152.4 (500)	365.8 (1200)	365.8 (1200)
	90	2/4	30.5 (100)	76.2 (250)	91.4 (300)	152.4 (500)	365.8 (1200)	365.8 (1200)
6	110	2/4	30.5 (100)	76.2 (250)	91.4 (300)	152.4 (500)	365.8 (1200)	365.8 (1200)
	132	2/4	30.5 (100)	76.2 (250)	91.4 (300)	152.4 (500)	365.8 (1200)	365.8 (1200)
9	160	2	30.5 (100)	68.6 (225)	91.4 (300)	152.4 (500)	274.3 (900)	365.8 (1200)
	200	2	30.5 (100)	68.6 (225)	91.4 (300)	152.4 (500)	274.3 (900)	365.8 (1200)
10	250	2	30.5 (100)	68.6 (225)	76.2 (250)	121.9 (400)	274.3 (900)	365.8 (1200)
	315	2	30.5 (100)	68.6 (225)	76.2 (250)	121.9 (400)	274.3 (900)	365.8 (1200)
	355	2	30.5 (100)	68.6 (225)	76.2 (250)	121.9 (400)	274.3 (900)	365.8 (1200)
	400	2	30.5 (100)	68.6 (225)	76.2 (250)	121.9 (400)	243.8 (800)	304.8 (1000)

Ratings and Protection Devices

208 Volt AC Input Protection Devices, Frames 1-6

Drive Catalog Number	HP Rating	PWM Freq.	Temp. °C	Input Ratings			Output Amps	Dual Element Time Delay Fuse			Non-Time Delay Fuse Min.(1)	Max.(2)	Circuit Breaker (3)	Motor Circuit Protector(s)	140M Motor Starter with Adjustable Current Range (6)(7)	
				ND	HD	kHz		Amps	kVA	Cont. 1 Min.	3 Sec.					
20DB4P2	1	0.75	0.37	4	50	3.7	1.3	4.8	5.6	7.0	6	10	6	17.5	15	M-C2E-B63
20DB6P8	1	1.5	0.75	4	50	6.8	2.4	7.8	10.4	13.8	10	15	10	30	30	M-D8E-C10
20DB9P6	1	2.2	1.5	4	50	9.5	3.4	11	12.1	17	12	20	12	40	40	M-D8E-C16
20DB015	1	4.0	2.2	4	50	15.7	5.7	17.5	19.3	26.3	20	35	20	70	70	M-D8E-C20
20DB022	1	5.5	4.0	4	50	23.0	8.3	25.3	27.8	38	30	50	30	100	100	M-D8E-C25
20DB028	2	7.5	5.5	4	50	29.6	10.7	32.2	38	50.6	40	70	40	125	125	M-F8E-C25
20DB042	3	11	7.5	4	50	44.5	16.0	48.3	53.1	72.5	60	100	60	175	175	M-F8E-C32
20DB052	3	15	11	4	50	51.5	17.1	56	64	86	80	125	80	200	200	M-CMN-400
20DB070	4	18.5	15	4	50	72	25.9	78.2	86	117.3	90	175	90	300	300	M-CMN-600
20DB080	4	22	18.5	4	50	84.7	30.5	92	117.3	156.4	110	200	110	350	350	M-CMN-800
20DB104	5	30	-	4	50	113	40.7	120	132	175	150	250	150	475	350	M-CMN-900
	-	22	4	50	84.7	30.5	92	138	175	125	200	125	350	300	150	-
20DB130	5	30	-	4	50	122	44.1	130	143	175	175	275	175	500	375	M-CMN-900
	-	30	4	50	98	35.3	104	156	175	125	225	125	400	300	150	-
20DB154	6	45	-	4	50	167	60.1	177	195	266	225	350	225	500	250	-
	-	37	4	50	141	50.9	150	225	300	200	300	200	500	450	250	-
20DB182	6	55	-	4	50	208	75.0	221	243	308	300	450	300	600	400	-
	-	45	4	50	167	60.1	177	266	308	225	350	225	500	250	-	-
20DB260	6	66	-	2	50	255	91.9	280	286	380	250	450	250	600	400	-
	-	55	2	50	199	71.7	205	305	410	350	550	350	750	500	400	-

(1)Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.

(2)Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(3)Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(4)Maximum allowable rating by US NEC. Exact size must be chosen for each installation.

(5)Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC minimum size is 125% of motor FLA. Ratings shown are maximum.

(6)Bulletin 140M with adjustable current range should have the current trip set to the minimum range that the device will not trip.

(7)Manual Self-Protected (Type E) Combination Motor Controller, UL listed for 208 Wye or Delta, 240 Wye or Delta, 480Y/277 or 600Y/ 347. Not UL listed for use on 480V or 600V Delta/Delta systems.

(8)The AIC ratings of the Bulletin 140M Motor Protector may vary. See publication 140M-SG001.

Ratings and Protection Devices, Cont.

240 Volt AC Input Protection Devices, Frames 1 - 6

Drive Catalog Number	HP Rating	Temp Freq.	PWM kHz	Input Ratings			Output Amps			Dual Element Time Delay Fuse			Non-Time Delay Fuse		Circuit Breaker (3)	Motor Circuit Protector (6)	140M Motor Starter with Adjustable Current Range (6/7)
				ND	HD	Max. (1)	Min. (1)	Max. (2)	Min. (2)	Max. (4)	Max. (4)	Max. (4)	Max. (4)	Max. (4)			
20DB4P2	1	1	0.75	4	50	3.3	1.4	4.2	4.8	6.4	5	5	15	15	7	M-C2E-B63	M-D8E-B63
20DB6P8	1	2	1.5	4	50	5.9	2.4	6.8	9	12	10	15	25	25	15	M-C2E-C10	M-D8E-C10
20DB9P6	1	3	2	4	50	8.3	3.4	9.6	10.6	14.4	12	20	35	35	15	M-C2E-C10	M-D8E-C10
20DB015	1	5	3	4	50	13.7	5.7	15.3	16.8	23	20	30	60	60	30	M-C2E-C16	M-F8E-C16
20DB022	1	7.5	5	4	50	19.9	8.3	22	24.2	33	25	50	80	80	30	M-C2E-C25	M-D8E-C25
20DB028	2	10	7.5	4	50	25.7	10.7	28	33	44	35	60	100	100	50	-	M-F8E-C32
20DB042	3	15	10	4	50	38.5	16.0	42	46.2	63	50	90	150	150	50	-	M-CMN-400
20DB052	3	20	15	4	50	47.7	19.8	52	63	80	60	100	200	200	100	-	M-CMN-600
20DB070	4	25	20	4	50	64.2	26.7	70	78	105	90	150	275	275	100	-	M-CMN-900
20DB080	4	30	25	4	50	73.2	30.5	80	105	136	100	180	300	300	100	-	M-CMN-900
20DB104	5	40	-	4	50	98	40.6	104	115	175	125	225	300	300	150	-	-
	-	30	4	50	73	30.5	80	120	160	100	175	100	300	300	100	-	M-CMN-900
20DB130	5	50	-	4	50	122	50.7	130	143	175	175	275	375	375	250	-	-
	-	40	4	50	98	40.6	104	156	175	125	225	125	400	300	150	-	-
20DB154	6	60	-	4	50	145	60.1	154	169	231	200	300	450	450	250	-	-
	-	50	4	50	122	50.7	130	195	260	175	275	175	500	375	250	-	-
20DB192	6	75	-	4	50	180	74.9	192	211	288	225	400	600	575	250	-	-
	-	60	4	50	145	60.1	154	231	308	200	300	200	450	250	-	-	-
20DB250	6	100	-	2	45	255	91.9	260	286	390	250	450	600	400	400	-	-
	-	75	2	50	199	71.7	205	305	410	350	550	350	750	750	400	-	-

(1) Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.

(2) Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(3) Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(4) Maximum allowable rating by US NEC. Exact size must be chosen for each installation.

(5) Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC minimum size is 125% of motor FLA. Ratings shown are maximum.

(6) Bulletin 140M with adjustable current range should have the current trip set to the minimum range that the device will not trip.

(7) Manual Self-Protected (Type E) Combination Motor Controller, UL listed for 208 Y/277 or 600Y/ 347. Not UL listed for use on 480V or 600V Delta/Delta systems.

(8) The AIC ratings of the Bulletin 140M Motor Protector may vary. See publication 140M-SG001.

Ratings and Protection Devices, Cont.

400 Volt AC Input Protection Devices, Frames 1 - 6

Drive Catalog Number	KW Rating	PWM Freq.	Input Ratings	Output Amps	Dual Element Time Delay Fuse	Non-Time Delay Fuse	Circuit Breaker ⁽⁶⁾	Motor Circuit Protector ⁽⁸⁾	140M Motor Starter with Adjustable Current Range ⁽⁹⁾⁽¹⁰⁾	Available Catalog Numbers ⁽¹¹⁾
ND	HD	kHz	Amps	kVA	Cont.	1 Min.	Max. ⁽⁵⁾	Min. ⁽⁴⁾	Max. ⁽⁷⁾	Max. ⁽⁷⁾
20DC2P1	1	0.75	0.55	4	50	1.8	2.1	2.4	3	3
20DC3P4	1	1.5	0.75	4	50	3.2	2.2	3.5	6	12
20DC5P0	1	2.2	1.5	4	50	4.6	3.2	5.5	6	20
20DC8P0	1	4	2.2	4	50	7.9	5.5	8.7	9.9	15
20DC011	1	5.5	4	4	50	10.8	7.5	11.5	13	20
20DC014	1	7.5	5.5	4	50	14.4	10.0	15.4	17.2	30
20DC022	1	11	7.5	4	50	20.6	14.3	22	24.2	30
20DC027	2	15	11	4	50	28.4	19.7	30	33	45
20DC034	2	18.5	15	4	50	35.0	24.3	37	45	60
20DC040	3	22	18.5	4	50	40.7	28.2	43	56	74
20DC052	3	30	22	4	50	53	36.7	56	64	86
20DC065	3	37	30	4	50	68.9	47.8	72	84	112
20DC077 ⁽¹⁾	4	45	-	4	45	81.4	56.4	85	94	128
-	37	4	45	45	68.9	47.8	72	108	144	90
20DC096	5	55	-	4	50 ⁽³⁾	100.5	69.6	105	116	158
-	45	4	50 ⁽³⁾	81.4	56.4	85	128	170	110	175
20DC125	5	55	-	4	50 ⁽³⁾	121.1	83.9	125	138	163
-	45	4	50 ⁽³⁾	91.9	63.7	125	138	150	275	375
20DC156	6	90	-	4	50 ⁽³⁾	164	126	170	187	250
-	75	4	50 ⁽³⁾	136	103	140	210	280	200	375
20DC180 ⁽²⁾	6	110	-	4	40 ⁽³⁾	199	148	205	220	289
-	90	4	40 ⁽³⁾	164	126	170	255	313	250	375
20DC248	6	132	-	2	45 ⁽³⁾	255	177	260	286	350
-	110	2	50 ⁽³⁾	199	138	205	308	410	250	450
									600	600
									400	400
									-	-
									-	-

(1)20BC085 current rating is limited to 45 degrees C ambient.

(2)20BC205 current rating is limited to 40 degrees C ambient.

(3)UL Type 12/IP54 (flange mount) heatsink ambient temperature rating is 40° C/ambient of unprotected drive portion (inside enclosure) is 55° C. The ambient temperature for the UL Type 12/IP54 standalone drives is 40° C.

(4)Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.

(5)Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(6)Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(7)Maximum allowable rating by US NEC. Exact size must be chosen for each installation.

(8)Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC minimum size is 125% of motor FLA. Ratings shown are maximum.

(9)Bulletin 140M with adjustable current range should have the current trip set to the minimum range that the device will not trip.

(10)Manual Self-Protected (Type E) Combination Motor Controller, UL listed for 208 Wye or Delta, 240 Wye or Delta, 480Y/277 or 600Y/ 347. Not UL listed for use on 480V or 600V Delta/Delta systems.

(11)The AIC ratings of the Bulletin 140M Motor Protector may vary. See publication 140M-SG001.

Ratings and Protection Devices, Cont.

400 Volt AC Input Protection Devices, Frames 9 & 10

Drive Catalog Number	kW Rating	PWM Freq.	Input Ratings	Output Amps	Cont. 1 Min.	Peak (1)	Min. (2)	Dual Element Time Delay Fuse	Non-Time Delay Fuse	Circuit Breaker (4)	Motor Circuit Protector (6)	Watts Loss
	ND	HD	kHz	Amps				Max. (3)	Min.	Max. (5)	Max.	Watts
20xC261	9	132	-	2	263	261	287	410	350	350	400	2700
		-	110	2	207	205	308	410	275	600	300	2700
20xC300	9	160	-	2	302	300	330	500	400	650	400	3100
		-	132	2	247	245	368	490	350	500	700	3100
20xC385	10	200	-	2	388	385	424	600	500	850	700	4320
		-	160	2	302	300	450	600	400	650	1100	4320
20xC460	10	250	-	2	463	460	506	770	600	1000	600	5335
		-	200	2	388	385	578	770	500	850	1000	5335
20xC500	10	250	-	2	463	500	550	750	600	1000	600	5921
		-	200	2	388	420	630	840	500	850	1200	5921
		-	200	2	388	420	630	840	500	1000	1100	5921

(1)Peak duration is 2 Sec. for 700H and 3 Sec. for 700S

(2)Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.

(3)Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(4)Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum

(5)Maximum allowable rating by US NEC. Exact size must be chosen for each installation.

(6)Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC minimum size is 125% of motor FLA. Ratings shown are maximum

Ratings and Protection Devices, Cont.

480 Volt AC Input Protection Devices, Frames 1 - 6

Drive Catalog Number	HP Rating	Temp. °C	Input Ratings Amps	Output Amps	Dual Element Time Delay Fuse			Non-Time Delay Fuse	Circuit Breaker (4)	Motor Circuit Protector (6)	140M Motor Starter with Adjustable Current Range 7(8)	Watts Loss		
					ND	HD	kHz	Cont. 1 Min.	3 Sec.	Min. (2)	Max. (3)	Max. (5)	Available Catalog Numbers (9)	
20DD2P1	1	0.75	4	50	1.6	1.4	2.1	3.2	3	6	15	3	M-C2E-B25	
20DD3P4	1	2	1.5	4	50	2.6	2.2	3.4	4	8	12	15	7	M-C2E-B40
20DD5P0	1	3	2	4	50	3.9	3.2	5.0	4.5	6.0	10	20	20	M-D8E-B63
20DD8P0	1	5	3	4	50	6.9	5.7	8.0	8.8	12	15	30	15	M-C2E-C10
20DD011	1	7.5	5	4	50	9.5	7.9	11	12.1	16.5	15	40	15	M-C2E-C16
20DD014	1	10	7.5	4	50	12.5	10.4	14	16.5	22	17.5	50	20	M-F8E-C16
20DD022	1	15	10	4	50	19.9	16.6	22	24.2	33	25	80	30	M-C2E-C25
20DD027	2	20	15	4	50	24.8	21	33	44	60	35	100	50	M-F8E-C25
20DD034	2	25	20	4	50	31.2	25.9	34	40.5	54	70	125	50	M-CMN-4000
20DD040	3	30	25	4	50	36.7	30.5	40	51	68	90	150	50	M-CMN-4000
20DD052	3	40	30	4	50	47.7	39.7	52	60	80	60	200	200	M-CMN-6300
20DD065	3	50	40	4	50	59.6	49.6	65	78	104	80	125	80	M-CMN-9000
20DD077	4	60	-	4	45	72.3	60.1	77	85	116	100	170	100	M-CMN-9000
-	50	4	45	59.6	49.6	65	98	130	80	125	80	250	250	M-CMN-9000
20DD096	5	75	-	4	50(1)	90.1	74.9	96	106	144	125	200	125	M-F8E-C45
-	60	4	50(1)	72.3	60.1	77	116	154	100	170	100	300	300	M-CMN-4000
20DD125	5	100	-	4	50(1)	117	97.6	125	138	163	150	250	150	M-CMN-9000
-	75	4	50(1)	90.1	74.9	96	144	168	125	200	125	350	350	M-CMN-9000
20DD156	6	125	-	4	50(1)	147	122	156	172	233	200	350	250	M-CMN-9000
-	100	4	50(1)	131	109	125	188	250	175	250	175	500	375	M-CMN-9000
20DD180	6	150	-	4	40(1)	169	141	180	198	270	225	400	225	M-CMN-9000
-	125	4	40(1)	147	122	156	234	312	200	350	200	600	450	M-CMN-9000
20DD248	6	200	2	45(1)	233	194	248	273	372	300	550	300	700	400
-	150	2	50(1)	169	141	180	270	360	225	400	225	600	500	M-CMN-9000

(1)UL Type 12/IP54 (flange mount) heatsink ambient temperature rating is 40° C/ambient of unprotected drive portion (inside enclosure) is 55° C. The ambient temperature for the UL Type 12/IP54 standalone drives is 40° C.

(2)Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.

(3)Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(4)Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(5)Maximum allowable rating by US NEC. Exact size must be chosen for each installation.

(6)Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC minimum size is 125% of motor FLA. Ratings shown are maximum.

(7)Bulletin 140M with adjustable current range should have the current trip set to the minimum range that the device will not trip.

(8)Manual Self-Protected (Type E) Combination Motor Controller, UL listed for 208 Wye or Delta, 240 Wye or Delta, 480Y/277 or 600Y/347. Not UL listed for use on 480V or 600V Delta/Delta systems.

(9)The AIC ratings of the Bulletin 140M Motor Protector may vary. See publication 140M-SG001.

Ratings and Protection Devices, Cont.

480 Volt AC Input Protection Devices, Frames 9 & 10

Drive Catalog Number	HP	PWN Freq.	Input Ratings	Output Amps	Dual Element Time Delay Fuse	Non-Time Delay Fuse	Circuit Breaker (4)	Motor Circuit Protector (6)	Watts Loss
ND	kW	kHz	Amps	Cont.	Min. (2)	Max. (3)	Max. (5)	Max.	Watts
20xD261	9	200	-	2	252	261	287	410	350
	-	150	2	207	205	308	410	275	350
20xD300	9	250	-	2	290	300	330	500	450
	-	200	2	247	245	368	490	350	650
20xD385	10	300	-	2	372	385	424	600	500
	-	250	2	302	300	450	600	400	850
20xD460	10	350	-	2	444	460	506	770	600
	-	300	2	338	385	578	770	500	850
20xD500	10	450	-	2	483	500	550	750	650
	-	350	2	423	420	630	840	550	900

(1)Peak duration is 2 Sec. for 700H and 3 Sec. for 700S

(2)Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.

(3)Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(4)Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum

(5)Maximum allowable rating by US NEC. Exact size must be chosen for each installation.

(6)Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC minimum size is 125% of motor FLA. Ratings shown are maximum

Ratings and Protection Devices, Cont.

600 Volt AC Input Protection Devices, Frames 1 - 6

Drive Catalog Number	HP	PWM Freq.	Temp. °C	Input Ratings Amps	KVA	Cont. 1 Min. 3 Sec.	Dual Element Time Delay Fuse Min. (2) Max. (3)	Non-Time Delay Fuse Min. (2) Max. (3)	Circuit Breaker (4)	Motor Circuit Protector (6)	140M Motor Starter with Adjustable Current Range (7)(8)	Watts Loss
	HP	ND	kHz	Amps			Max. (5)	Max. (5)				Watts
20DE1P7	1	0.5	4	50	1.3	1.4	1.7	2	2.6	4	2	-
20DE2P7	1	2	4	50	2.1	2.1	2.7	3.6	4.8	3	3	-
20DE3P9	1	3	2	50	3.0	3.1	3.9	4.3	5.9	6	6	-
20DE6P1	1	5	3	50	5.3	5.5	6.1	6.7	9.2	9	12	15
20DE9P0	1	7.5	5	4	50	7.8	8.1	9	9.9	13.5	10	20
20DE011	1	10	7.5	4	50	9.9	10.2	11	13.5	18	15	30
20DE017	1	15	10	4	50	15.4	16.0	17	18.7	25.5	20	40
20DE022	2	20	15	4	50	20.2	21.0	22	25.5	34	30	60
20DE027	2	25	20	4	50	24.8	25.7	27	33	44	35	80
20DE032	3	30	25	4	50	29.4	30.5	32	40.5	54	40	100
20DE041	3	40	30	4	50	37.6	39.1	41	48	64	50	125
20DE052	3	50	40	4	50	47.7	49.6	52	61.5	82	60	150
20DE062	4	60	50	2	45	58.2	60.5	62	78	104	80	200
20DE077	5	75	-	2	45	72.3	75.1	77	85	116	90	225
20DE089	5	100	-	2	50 ⁽¹⁾	58.2	60.5	63	94	126	90	300
20DE125	6	125	-	2	50 ⁽¹⁾	92.9	96.6	99	109	126	125	375
20DE144	6	150	-	2	50 ⁽¹⁾	117	122	125	-	150	100	375
	-	125	2	40 ⁽¹⁾	117	122	125	-	150	150	100	375

(1)UL Type 12/IP54 (flange mount) heatsink ambient temperature rating is 40° C/ambient of unprotected drive portion (inside enclosure) is 55° C. The ambient temperature for the UL Type 12/IP54 standalone drives is 40° C.

(2)Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(3)Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(4)Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(5)Maximum allowable rating by US NEC. Exact size must be chosen for each installation.

(6)Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC minimum size is 125% of motor FLA. Ratings shown are maximum.

(7)Bulletin 140M with adjustable current range should have the current trip set to the minimum range that the device will not trip.

(8)Manual Self-Protected (Type E) Combination Motor Controller, UL listed for 208 Wye or Delta, 240 Wye or Delta, 480Y/277 or 600Y/ 347. Not UL listed for use on 480V or 600V Delta/Delta systems.

(9)The AIC ratings of the Bulletin 140M Motor Protector may vary. See publication 140M-SG001.

Ratings and Protection Devices, Cont.

600 Volt AC Input Protection Devices, Frames 9 & 10

Drive Catalog Number	HP Rating	Input Freq.	PWM kHz	Output Amps	Dual Element Time Delay Fuse		Non-Time Delay Fuse		Circuit Breaker (4)	Motor Circuit Protector (6)	Watts Loss
					Cont.	1 Min.	Peak(1)	Min. (2)	Max. (3)	Max.	
20DE170	9 150	- 2	164	170	187	245	225	350	225	500	250
	- 150	2	139	144	216	245	200	300	200	400	200
20DE208	9 200	- 2	201	208	230	289	300	450	300	600	350
	- 150	2	164	170	250	289	225	350	225	500	250
20DE261	10 250	- 2	252	261	287	375	350	550	350	700	350
	- 200	2	201	208	312	375	300	450	300	600	300
20DE325	10 350	- 2	314	325	358	470	400	700	400	900	450
	- 250	2	252	261	392	470	350	550	350	700	400
20DE385	10 400	- 2	372	385	424	585	500	850	500	1100	500
	- 350	2	314	325	488	585	400	700	400	900	450
20DE416	10 450	- 2	402	416	458	585	550	900	550	1200	550
	- 350	2	314	325	488	585	400	700	400	900	450

(1) Peak duration is 2 Sec. for 700H and 3 Sec. for 700S

(2) Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.

(3) Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(4) Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum

(5) Maximum allowable rating by US NEC. Exact size must be chosen for each installation.

(6) Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC minimum size is 125% of motor FLA. Ratings shown are maximum

Ratings and Protection Devices, Cont.

690 Volt AC Input Protection Devices, Frames 5 & 6

Drive Catalog Number	Frame	kW Rating		PWM Freq.	Temp. °C	Input Ratings		Output Amps			Dual Element Time Delay Fuse		Non-Time Delay Fuse		Circuit Breaker (4)	Motor Circuit Protector (6)	Watts Loss
		ND	HD			kHz	Amps	KVA	Cont.	1 Min.	3 Sec.	Min. (2)	Max. (3)	Min. (2)	Max. (3)		
20DF052	5	45	—	4	50(1)	46.9	56.1	52	57	78	60	110	60	175	175	—	—
		—	37.5	4	50(1)	40.1	48.0	46	69	92	50	90	50	150	150	—	—
20DF060	5	55	—	4	50(1)	57.7	68.9	60	66	90	80	125	80	225	225	—	—
		—	45	4	50(1)	46.9	56.1	52	78	104	60	110	60	175	175	—	—
20DF082	5	75	—	2	50(1)	79.0	94.4	82	90	120	100	200	100	375	375	—	—
		—	55	2	50(1)	57.7	68.9	60	90	123	80	125	80	225	225	—	—
20DF098	5	90	—	2	40(1)	94.7	113	98	108	127	125	200	125	375	375	—	—
		—	75	2	40(1)	79.0	94.4	82	123	140	100	200	100	375	375	—	—
20DF119	6	110	—	2	50(1)	115	137	119	131	179	150	250	150	400	—	—	—
		—	90	2	50(1)	94.7	113	98	147	196	125	200	125	375	—	—	—
20DF142	6	132	—	2	50(1)	138	165	142	156	213	175	300	175	450	—	—	—
		—	110	2	50(1)	115	137	119	179	238	150	250	150	400	—	—	—

(1)UL Type 12/IP54 (flange mount) heatsink ambient temperature rating is 40° C/ambient of unprotected drive portion (inside enclosure) is 55° C. The ambient temperature for the UL Type 12/IP54 standalone drives is 40° C.

(2)Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.

(3)Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(4)Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(5)Maximum allowable rating by US NEC. Exact size must be chosen for each installation.

(6)Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC minimum size is 125% of motor FLA. Ratings shown are maximum.

690 Volt AC Input Protection Devices, Frames 9 & 10

Drive Catalog Number	Frame	kW Rating		PWM Freq.	Input Ratings	Output Amps			Dual Element Time Delay Fuse		Non-Time Delay Fuse		Circuit Breaker (4)	Motor Circuit Protector (6)
		ND	HD			kHz	Amps	Cont.	1 Min.	Peak(1)	Min. (2)	Max. (3)	Min.	Max.
20xE170	9	160	—	2	171	170	187	245	225	350	225	550	500	250
		—	132	2	145	144	216	245	200	300	200	500	400	200
20xE208	9	200	—	2	210	208	230	289	300	450	300	600	600	350
		—	160	2	171	170	250	289	225	350	225	500	500	250
20xE261	10	250	—	2	263	261	287	375	350	550	350	700	700	350
		—	200	2	210	208	312	375	300	450	300	600	600	300
20xE325	10	315	—	2	327	325	358	470	425	700	425	900	900	450
		—	250	2	263	261	392	470	350	550	350	700	700	350
20xE385	10	355	—	2	388	385	424	585	500	850	500	1100	1100	500
		—	315	2	327	325	488	585	450	700	450	900	900	450
20xE416	10	400	—	2	419	416	458	585	500	900	550	1200	1200	550
		—	315	2	327	325	488	585	450	700	450	900	900	450

(1)Peak duration is 2 Sec. for 700H and 3 Sec. for 700S

(2)Minimum protection device size is the lowest rated device that supplies maximum protection without nuisance tripping.

(3)Maximum protection device size is the highest rated device that supplies drive protection. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum.

(4)Circuit Breaker - inverse time breaker. For US NEC, minimum size is 125% of motor FLA. Ratings shown are maximum

(5)Maximum allowable rating by US NEC. Exact size must be chosen for each installation.

(6)Motor Circuit Protector - instantaneous trip circuit breaker. For US NEC minimum size is 125% of motor FLA. Ratings shown are maximum

Ratings and Protection Devices, Cont.

540 Volt DC Input Protection Devices, Frames 5 & 6

Drive Catalog Number	Frame	kW Rating		DC Input Ratings		Output Amps			Fuse	Non-Time Delay Fuse(2)
		ND	HD	Amps	kW	Cont.	1 Min.	3 Sec.		
20DH096 (1)	5	55	—	105.3	68.3	105	116	158	200	HSJ175
		—	45	84.5	54.7	85	128	170	150	HSJ175
20DH125 (1)	5	55	—	158	88.9	125	138	163	250	HSJ200
		—	45	105.3	68.3	96	144	168	200	HSJ200
20DH156 (1)	6	90	—	192	110.9	170	187	255	300	HSJ350
		—	75	137.1	88.9	140	210	280	250	HSJ350
20DH180 (1)	6	110	—	232	132.2	205	220	289	400	HSJ350
		—	90	171.2	110.9	170	255	313	300	HSJ350
20DH248	6	132	—	298	—	260	286	390	550	HSJ400
		—	110	—	—	205	308	410	400	HSJ400

(1)Also applies to "P" voltage class. Fuses must be applied in the (+) leg and (-) leg of the DC Common Bus.

(2)The power source to Common Bus inverters must be derived from AC voltages 600V or less, as defined in NFPA70; Art 430-18 (NEC). Battery supplies or MG sets are not included. The following devices were validated to break current of the derived power DC Bus: *Disconnects*: Allen-Bradley Bulletin No. 1494, 30 to 400 A; Bulletin No. 194, 30 to 400 A, or ABB: OESA, 600 & 800 A; OESL, all sizes. *Fuses*: Bussmann Type JKS, all sizes; Type 170M, Case Sizes 1, 2 and 3, or Ferraz Shawmut Type HSJ, all sizes. For any other devices, please contact the factory.

540 Volt DC Input Protection Devices, Frames 9 & 10

Drive Catalog Number	Frame	kW Rating		PWM Freq.	Input Ratings		Output Amps			Fuse	Bussmann Style Fuse
		ND	HD		kHz	Amps	kW	Cont.	1 Min.		
20xH261	9	132	-	2	307	161	261	287	410	500	170M6608
		-	110	2	241	127	205	308	410	500	170M6608
20xH300	9	160	-	2	353	186	300	330	500	630	170M6610
		-	132	2	288	152	245	368	490	630	170M6610
20xH385	10	200	-	2	453	238	385	424	600	700	170M6611
		-	160	2	353	186	300	450	600	700	170M6611
20xH460	10	250	-	2	541	284	460	506	770	900	170M6613
		-	200	2	453	238	385	578	770	900	170M6613
20xH500	10	250	-	2	589	309	500	550	750	1000	170M6614
		-	200	2	494	260	420	630	840	1000	170M6614

(1)Peak duration is 2 Sec. for 700H and 3 Sec. for 700S

Ratings and Protection Devices, Cont.

650 Volt DC Input Protection Devices, Frames 5 & 6

Drive Catalog Number	Frame	HP Rating		DC Input Ratings		Output Amps			Fuse	Non-Time Delay Fuse ⁽²⁾
		ND	HD	Amps	kW	Cont.	1 Min.	3 Sec.		
20DJ096 ⁽¹⁾	5	75	—	105.3	68.3	96	106	144	200	HSJ175
		—	60	84.5	54.7	77	116	154	150	HSJ175
20DJ125 ⁽¹⁾	5	100	—	137.1	88.9	125	138	163	250	HSJ200
		—	75	105.3	68.3	96	144	168	200	HSJ200
20DJ156 ⁽¹⁾	6	125	—	171.2	110.9	156	172	234	300	HSJ300
		—	100	137.1	88.9	125	188	250	250	HSJ300
20DJ180 ⁽¹⁾	6	150	—	204.1	132.2	180	198	270	400	HSJ400
		—	125	171.2	110.9	156	234	312	300	HSJ400
20DJ248	6	200	—	—	—	248	273	372	550	HSJ400
		—	150	—	—	180	270	360	400	HSJ400

(1)Also applies to "R" voltage class. Fuses must be applied in the (+) leg and (-) leg of the DC Common Bus.

(2)The power source to Common Bus inverters must be derived from AC Voltages 600V or less, as defined in NFPA70; Art 430-18 (NEC). Battery supplies or MG sets are not included. The following devices were validated to break current of the derived power DC Bus: *Disconnects*: Allen-Bradley Bulletin No. 1494, 30 to 400 A; Bulletin No. 194, 30 to 400 A, or ABB: OESA, 600 & 800 A; OESL, all sizes. *Fuses*: Bussmann Type JKS, all sizes; Type 170M, Case Sizes 1, 2 and 3, or Ferraz Shawmut Type HSJ, all sizes. For any other devices, please contact the factory.

650 Volt DC Input Protection Devices, Frames 9 & 10

Drive Catalog Number	Frame	HP Rating		PWM Freq.	Input Ratings		Output Amps			Fuse	Bussmann Style Fuse
		ND	HD	kHz	Amps	kW	Cont.	1 Min.	Peak (1)		
20xJ261	9	200	-	2	294	186	261	287	410	500	170M6608
		—	150	2	231	146	205	308	410	500	170M6608
20xJ300	9	250	-	2	338	213	300	330	500	630	170M6610
		—	200	2	276	174	245	368	490	630	170M6610
20xJ385	10	300	-	2	434	274	385	424	600	700	170M6611
		—	250	2	338	213	300	450	600	700	170M6611
20xJ460	10	350	-	2	519	327	460	506	770	900	170M6613
		—	300	2	434	274	385	578	770	900	170M6613
20xJ500	10	450	-	2	564	356	500	550	750	1000	170M6614
		—	350	2	474	299	420	630	840	1000	170M6614

(1) Peak duration is 2 Sec. for 700H and 3 Sec. for 700S

775 Volt DC Input Protection Devices, Frames 9 & 10

Drive Catalog Number	Frame	HP Rating		PWM Freq.	Input Ratings		Output Amps			Fuse	Bussmann Style Fuse
		ND	HD	kHz	Amps	kW	Cont.	1 Min.	Peak (1)		
20xK170	9	150	—	2	192	170	187	245	—	—	—
		—	150	2	162	144	216	245	—	—	—
20xK208	9	200	—	2	235	208	230	289	—	—	—
		—	150	2	192	170	250	289	—	—	—
20xK261	10	250	—	2	294	261	287	375	—	—	—
		—	200	2	235	208	312	375	—	—	—
20xK325	10	350	—	2	367	325	358	470	—	—	—
		—	250	2	294	261	392	470	—	—	—
20xK385	10	400	—	2	434	385	424	585	—	—	—
		—	350	2	367	325	488	585	—	—	—
20xK416	10	450	—	2	469	416	458	585	—	—	—
		—	350	2	367	325	488	585	—	—	—

(1) Peak duration is 2 Sec. for 700H and 3 Sec. for 700S

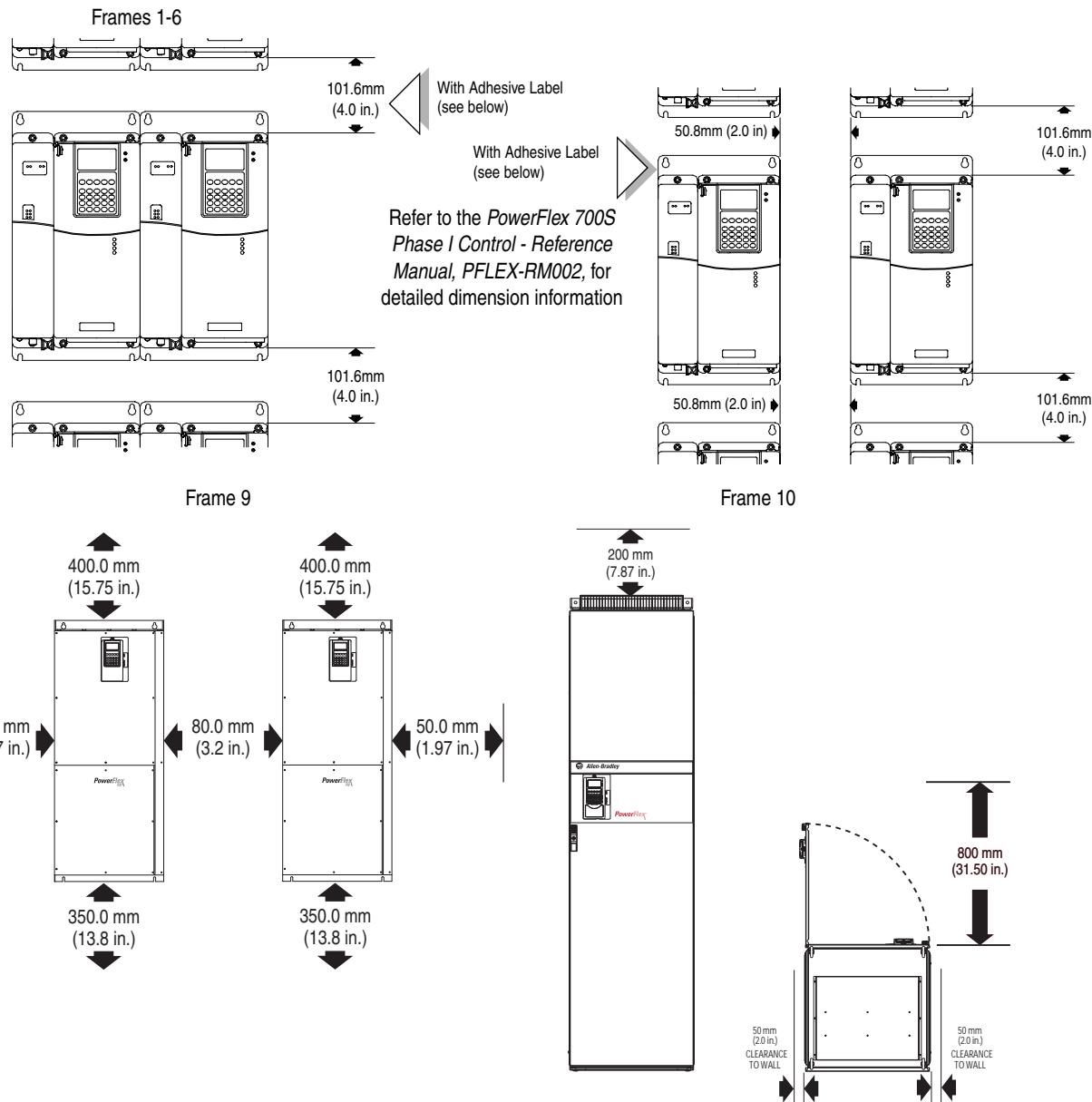
Ratings and Protection Devices, Cont.

932 Volt DC Input Protection Devices, Frames 9 & 10

Drive Catalog Number	Frame	HP Rating		PWM Freq. kHz	Input Ratings Amps	Output Amps			Fuse	Bussmann Style Fuse
		ND	HD			Cont.	1 Min.	Peak (1)		
20xM170	9	160	—	2	200	170	187	245	—	—
		—	132	2	170	144	216	245	—	—
20xM208	9	200	—	2	245	208	230	289	—	—
		—	160	2	200	170	250	289	—	—
20xM261	10	250	—	2	307	261	287	375	—	—
		—	200	2	245	208	312	375	—	—
20xM325	10	315	—	2	383	325	358	470	—	—
		—	250	2	307	261	392	470	—	—
20xM385	10	355	—	2	453	385	424	585	—	—
		—	315	2	383	325	488	585	—	—
20xM416	10	400	—	2	490	416	458	585	—	—
		—	315	2	383	325	488	585	—	—

(1) Peak duration is 2 Sec. for 700H and 3 Sec. for 700S

Mounting Clearances



Acceptable Surrounding Air Temperature & Required Actions

Drive Catalog Number	Required Action . . .		
	IP 20, NEMA Type 1	IP 20, NEMA Type Open	IP 00, NEMA Type Open
No Action Required	Remove Top Label	Remove Top Label & Vent Plate	
All <u>Except</u> 20DC072	40° C	50° C	NA
20DC072	40° C	45° C	50° C
Frame Size	Normal Duty	Heavy Duty	
Frame 9 & up	0 to 40 degrees C (32 to 104 degrees F)	0 to 40 degrees C (32 to 104 degrees F)	

Removing the adhesive label from the drive changes the NEMA enclosure rating from Type 1 to Open type.

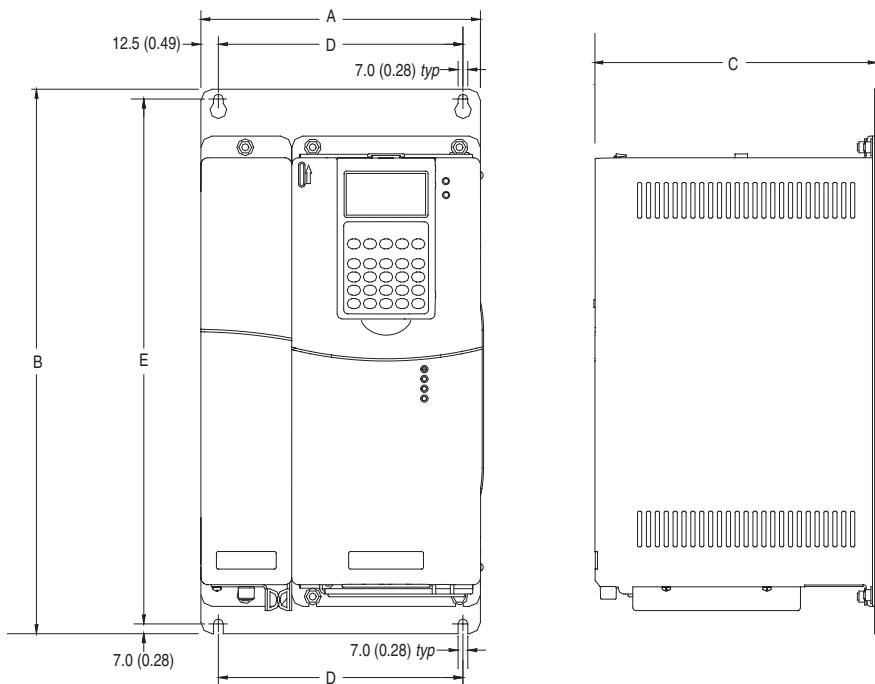
Approximate Dimensions

Frame	AC Input												DC Input			
	208		240		380 . . . 400V		480V		600V		690V		540V		650V	
	ND HP	HD HP	ND HP	HD HP	ND kW	HD kW	ND HP	HD HP	ND HP	HD HP	ND HP	HD HP	ND HP	HD HP	ND HP	HD HP
1	0.75	0.37	1.0	0.75	0.75	0.55	1	0.75	1	0.5	—	—	—	—	—	—
	1.5	0.75	2.0	1.5	1.5	0.75	2	1.5	2	1	—	—	—	—	—	—
	2.2	1.5	3.0	2.0	2.2	1.5	3	2	3	2	—	—	—	—	—	—
	4.0	2.2	5.0	3.0	4.0	2.2	5	3	5	3	—	—	—	—	—	—
	5.5	4.0	7.5	5.0	5.5	4.0	7.5	5	7.5	5	—	—	—	—	—	—
	—	—	—	—	7.5	5.5	10	7.5	10	7.5	—	—	—	—	—	—
	—	—	—	—	11	7.5	15	10	15	10	—	—	—	—	—	—
2	7.5	5.5	10	7.5	15	11	20	15	20	15	—	—	—	—	—	—
	—	—	—	—	18.5	15	25	20	25	20	—	—	—	—	—	—
3	11	7.5	15	10	22	18.5	30	25	30	25	—	—	—	—	—	—
	15	11	20	15	30	22	40	30	40	30	—	—	—	—	—	—
	—	—	—	—	37	30	50	40	50	40	—	—	—	—	—	—
4	18.5	15	25	20	45	37	60	50	60	50	—	—	—	—	—	—
	22	18.5	30	25	—	—	—	—	—	—	—	—	—	—	—	—
5	30	22	40	30	55	45	75	60	75	60	75	55	55	45	75	60
	30	30	50	40	55	45	100	75	100	75	90	75	55	45	75	60
	—	—	—	—	—	—	—	—	—	—	—	—	55	45	100	75
	—	—	—	—	—	—	—	—	—	—	—	—	55	45	100	75
6	45	37	60	50	90	75	125	100	125	100	110	90	90	75	125	100
	55	45	75	60	110	90	150	125	150	125	132	110	90	75	125	100
	66	55	100	75	132	110	200	150	—	—	—	—	110	90	150	125
	—	—	—	—	—	—	—	—	—	—	—	—	110	90	150	125
	—	—	—	—	—	—	—	—	—	—	—	—	132	110	200	150
	—	—	—	—	—	—	—	—	—	—	—	—	132	110	200	150
9	—	—	—	—	132	110	200	150	150	150	160	132	—	—	—	—
	—	—	—	—	160	130	250	200	200	150	200	160	—	—	—	—
10	—	—	—	—	200	160	300	250	250	200	250	200	—	—	—	—
	—	—	—	—	250	200	350	300	350	250	315	250	—	—	—	—
	—	—	—	—	250	250	450	350	400	350	355	315	—	—	—	—
	—	—	—	—	—	—	—	—	—	450	350	400	315	—	—	—

Approximate Dimensions, Cont.

PowerFlex 700S Frame 1-3 Dimensions (Frame 1 shown)

Dimensions are in millimeters and (inches).



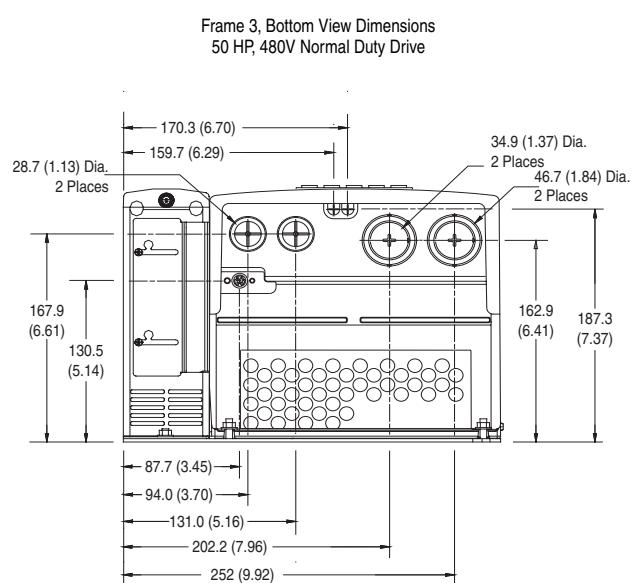
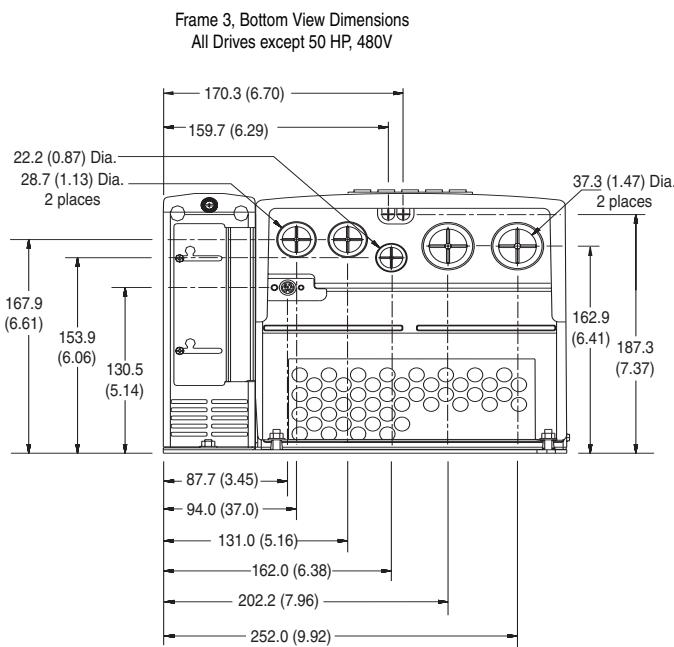
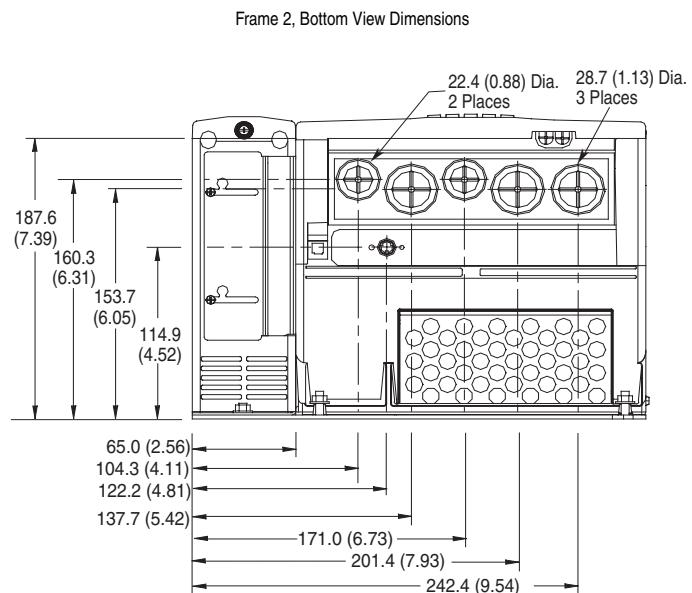
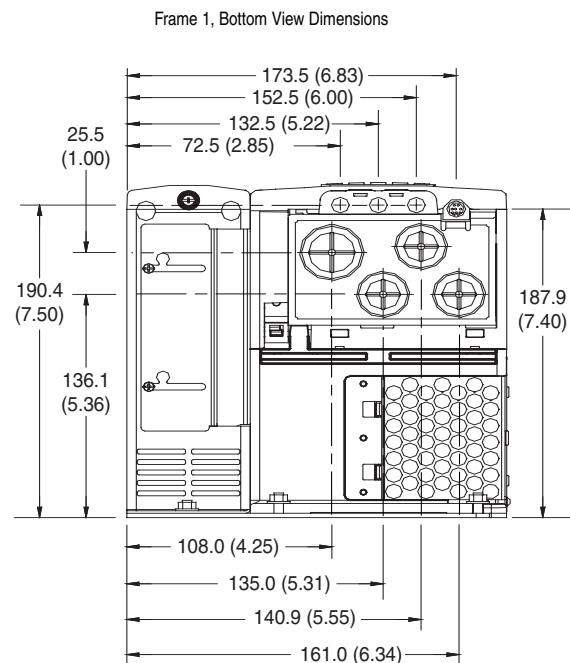
Frame	A	B	C	D	E	Approx. Weight ^① kg (lbs.)
1	200.0 (7.87)	389.0 (15.31)	202.8 (7.98)	175.0 (6.89)	375.0 (14.76)	11.3 (14.92)
2	285.0 (11.22)	389.0 (15.31)	202.8 (7.98)	250.0 (9.84)	375.0 (14.76)	18.4 (40.57)
3	285.0 (11.22)	564.0 (22.2)	202.8 (7.98)	250.0 (9.84)	550 (21.65)	26.6 (58.65)

^① Weights include HIM, DriveLogix controller with ControlNet daughtercard, Hi-Resolution Encoder Option and 20-COMM-C ControlNet adapter.

Approximate Dimensions, Cont.

PowerFlex 700S Frame 1-3, Bottom Views

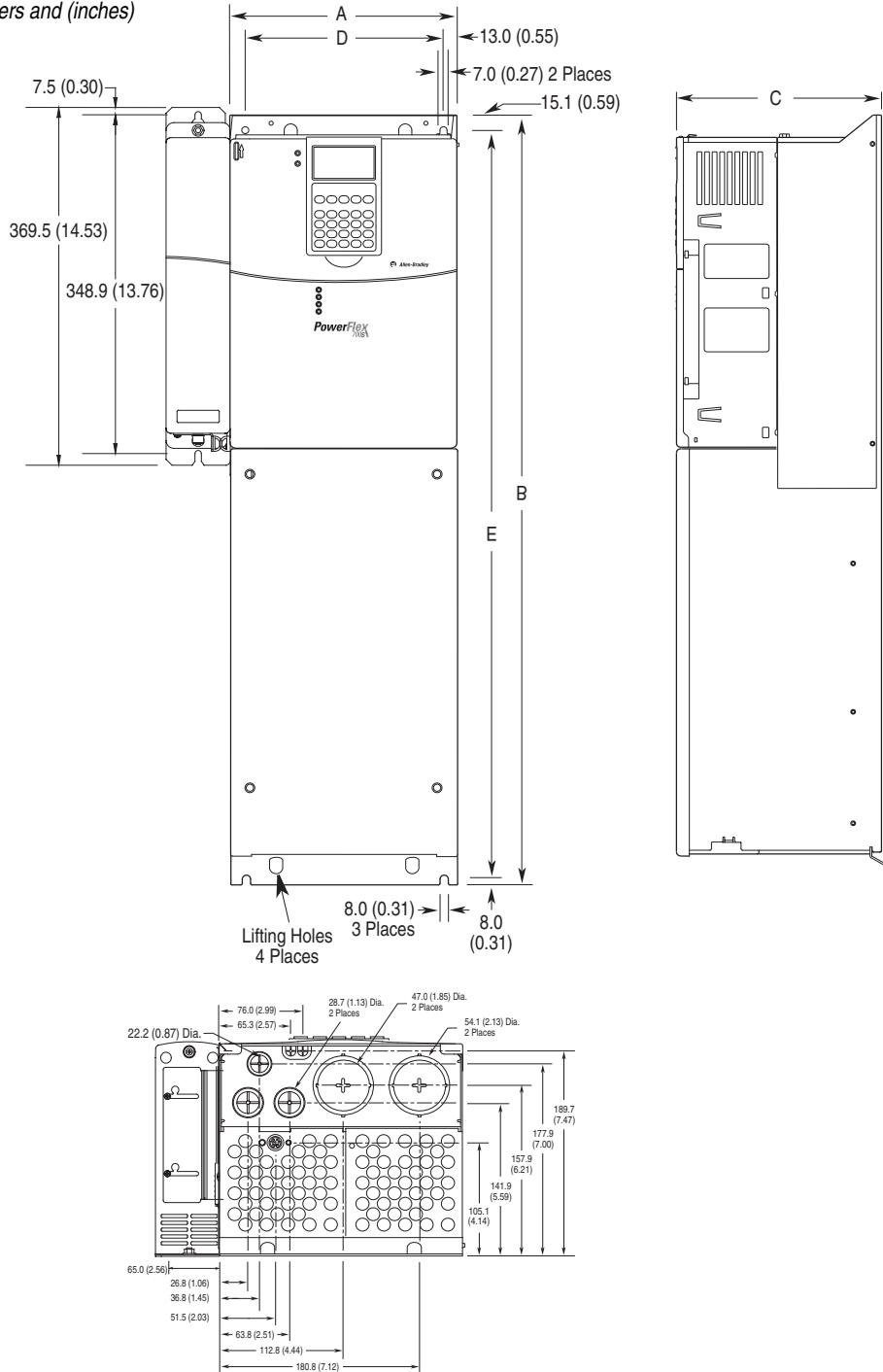
Dimensions are in millimeters and (inches)



Approximate Dimensions, Cont.

PowerFlex 700S Frame 4 Dimensions

Dimensions are in millimeters and (inches)



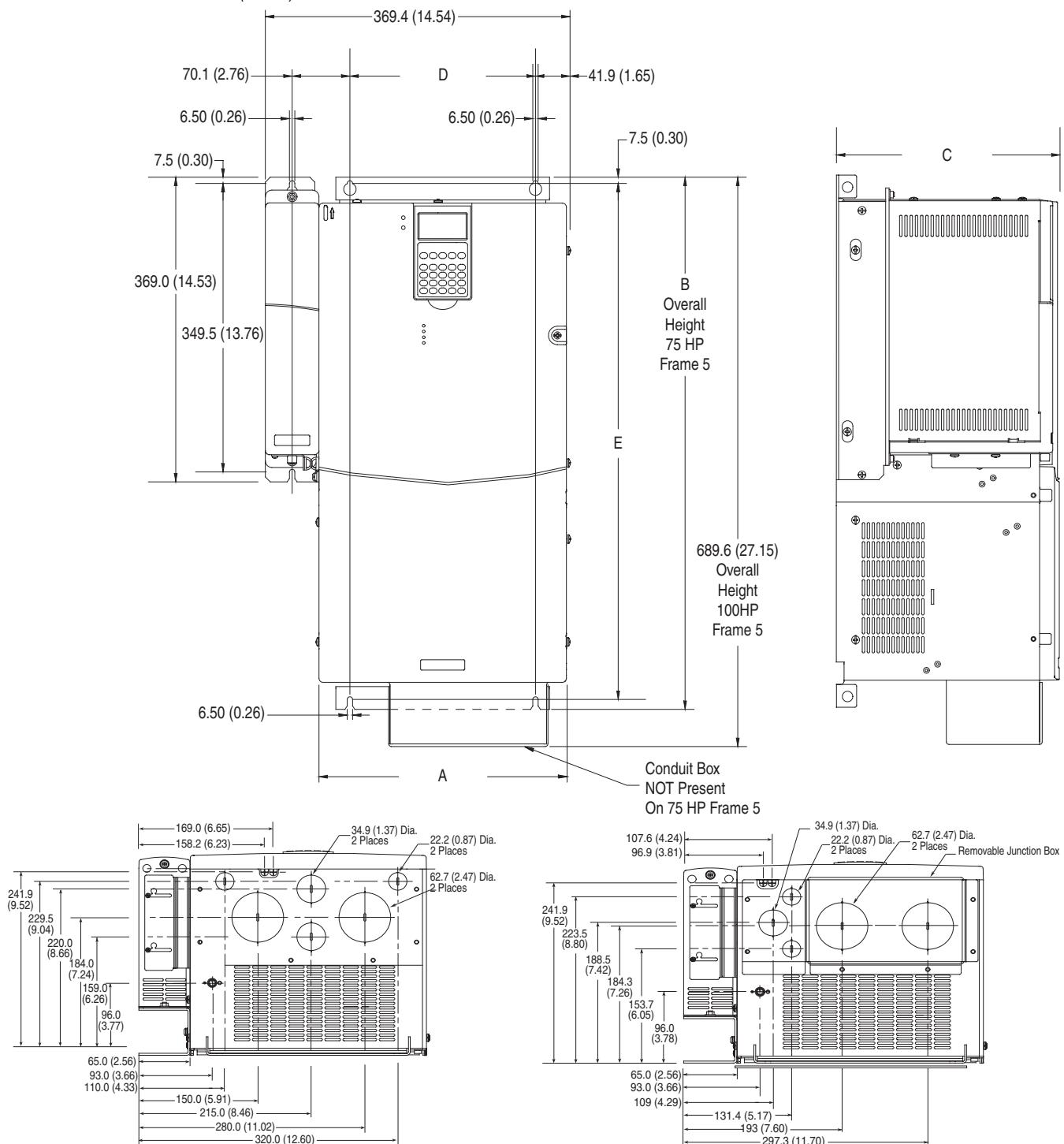
Frame	A (Max.)	B	C (Max.)	D	E	Approx. Weight ❶ kg (lbs.)	
						Drive	Drive & Packaging
4	220.8 (8.69)	758.8 (29.9)	201.8 (7.94)	192.0 (7.56)	741.7 (29.2)	28.4 (62.5)	29.03 (63.9)

❶ Weights include HIM and Standard I/O.

Approximate Dimensions, Cont.

PowerFlex 700S Frame 5 Dimensions

Dimensions are in millimeters and (inches)



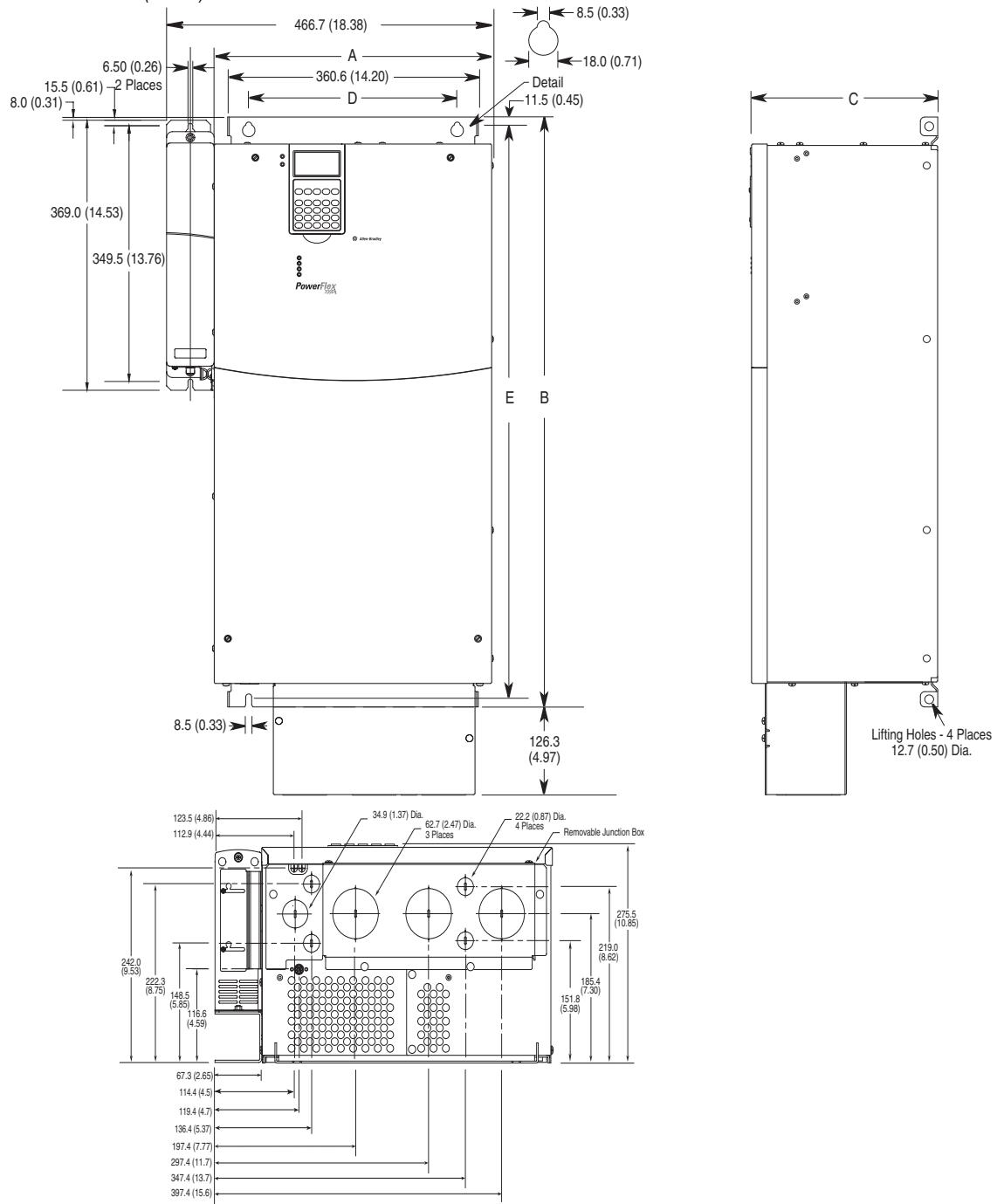
Frame	A	B	C	D	E	Approx Weight ● kg (lbs.)
5	308.9(12.16)	644.5(25.37)	275.4(10.84)	225.0(8.86)	625.0(24.61)	37.19 (82)

● Weights include HIM and Standard I/O.

Approximate Dimensions, Cont.

PowerFlex 700S Frame 6 Dimensions

Dimensions are in millimeters and (inches).



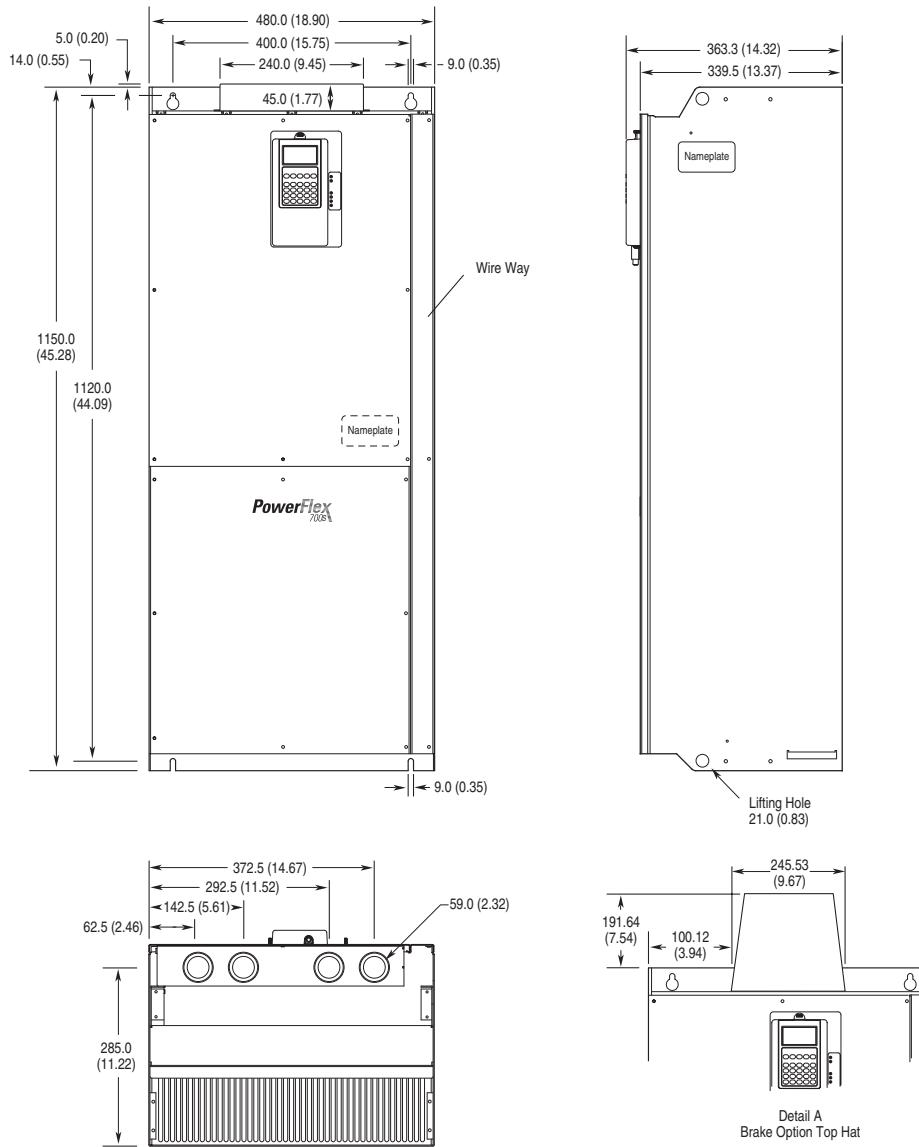
Frame	A (Max.)	B	C (Max.)	D	E	Approx. Weight ❶ kg (lbs.)	
						Drive	Drive and Packaging
6	403.90 (15.90)	850.00 (33.46)	275.50 (10.85)	300.00 (11.81)	825.00 (32.48)	71.44 (157.5)	92.85 (202.50)

❶Weights include HIM and Standard I/O.

Approximate Dimensions, Cont.

PowerFlex 700S Frame 9 Dimensions

Dimensions are in millimeters and (inches).

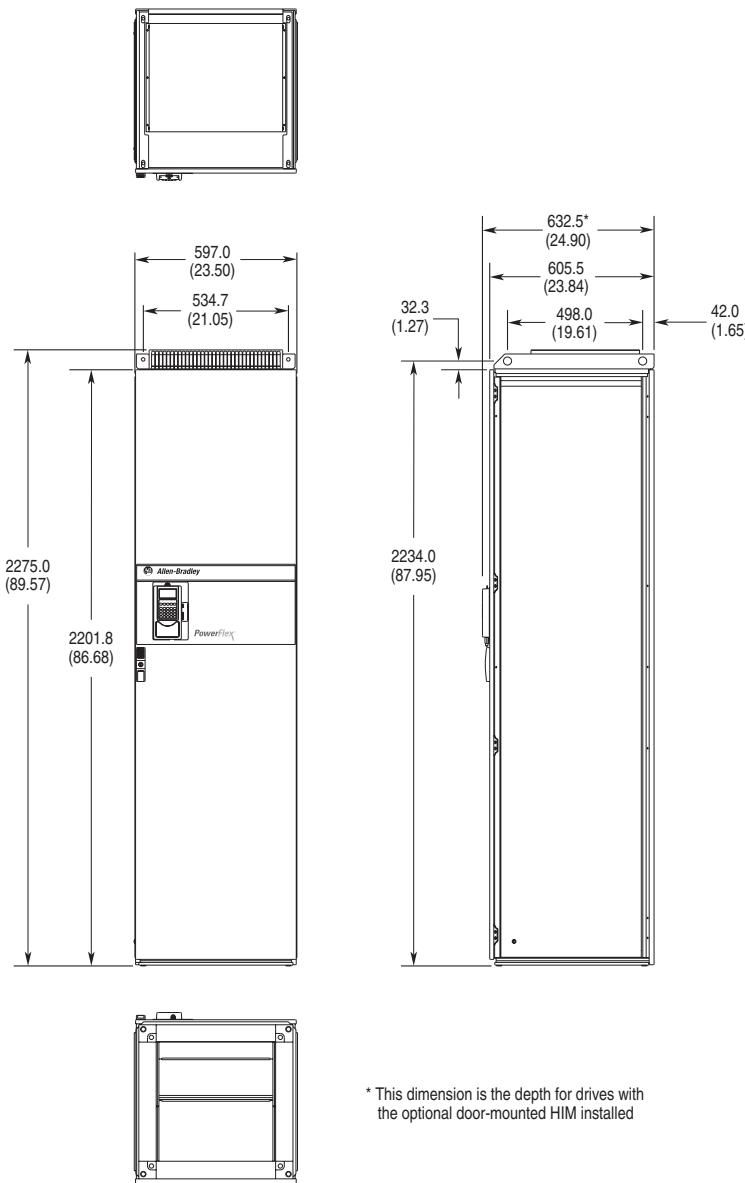


Frame Size	Type	Weight kg (lbs.)
Frame 9	400V AC , 261 Amp Drive & Enclosure	143 (315)
	400V AC , 300 Amp Drive & Enclosure	151 (333)
	400V DC, 261 Amp Drive & Enclosure	109 (240)
	400V DC, 300 Amp Drive & Enclosure	117 (257)
	600V AC Drive & Enclosure	143 (315)
	600V DC Drive & Enclosure	109 (240)

Approximate Dimensions, Cont.

PowerFlex 700S Frame 10 Dimensions, NEMA 1 IP21, Enclosure Code "A"

Dimensions are in millimeters and (inches).



Frame Size	Voltage Class	Drive Rating Amps	Approx. Weight kg (lbs.) Drive & Enclosure (AC Input)	Approx. Weight kg (lbs.) Drive & Enclosure (DC Input)
Frame 10	400	385	432 (952)	317 (699)
		460	432 (952)	317 (699)
		520	432 (952)	317 (699)
	600	261	370 (816)	317 (699)
		325	401 (884)	317 (699)
		385	401 (884)	317 (699)
		416	401 (884)	317 (699)

Specifications

Category	Specification											
		Frames 1-6 (690V Drive frames 5 & 6 only)						Frames 9 & 10				
Protection		200-208V	240V	380/400V	480V	600V (frames 0-4)	600V/ 690V (frames 5&6)	380/400V	480V	500V	600V	690V
	AC Input Overvoltage Trip:	247VAC	285VAC	475VAC	570VAC	690VAC	863VAC	475VAC	570V AC	611V AC	690VAC	863VAC
	Bus Overvoltage Trip:	405VDC	405VDC	810VDC	810VDC	1013VDC	1164VDC	810VDC	810VDC	810VDC	1164VDC	1164VDC
	Bus Undervoltage Trip:	Adjustable						Adjustable				
	Nominal Bus Voltage:	281VDC	324VDC	540VDC	648VDC	810VDC	931VDC	540VDC	648VDC	645VDC	810VDC	931VDC
	Heat Sink Thermistor:	Monitored by microprocessor overtemp trip						Monitored by microprocessor overtemp trip				
	Drive Overcurrent Trip											
	Software Current Limit:	Calculated value, 105% of motor rated to 200% of drive rated						Calculated value, 105% of motor rated to 200% of drive rated				
	Hardware Current Limit:	105% of 3 sec. rating (158%-210%)						360% of rated Heavy Duty current (typical)				
	Instantaneous Current Limit:	143% of 3 sec rating (215%-287%)						—				
	Line Transients:	Up to 6000 volts peak per IEEE C62.41-1991						up to 6000 volts peak per IEEE C62.41-1991				
	Control Logic Noise Immunity:	Showering arc transients up to 1500V peak						Showering arc transients up to 1500V peak				
	Power Ride-Thru:	15 milliseconds at full load						15 milliseconds at full load				
	Logic Control Ride-Thru	0.25 sec., drive not running						0.25 seconds, drive not running				
	Ground Fault Trip:	Phase-to-ground on drive output						Phase-to-ground on drive output				
	Short Circuit Trip:	Phase-to-phase on drive output						Phase-to-phase on drive output				
Agency Certification		The drive is designed to meet applicable requirements of the following codes/standards: IEC 61800-2 Adjustable speed electrical power drive systems - General requirements IEC 61800-5-1 Adjustable speed electrical power drive systems - Safety requirements NFPA 70 – US National Electric Code NEMA 250 – Enclosures for Electrical Equipment						The drive is designed to meet applicable requirements of the following codes/standards: IEC 61800-2 Adjustable speed electrical power drive systems - General requirements IEC 61800-5-1 Adjustable speed electrical power drive systems - Safety requirements NFPA 70 - US National Electrical Code				
		UL and cUL Listed to UL508C and CAN/CSA - 22.2 No. 14-95						UL and cUL Listed to UL508C and CAN/CSA - 22.2 No. 14-95				
		Marked for all applicable European Directives EMC Directive (89/336/EEC) Emissions EN 61800-3 Adjustable Speed electrical power drive systems Part 3 Immunity EN 61800-3 Second Environment, Restricted Distribution Low Voltage Directive (73/23/EEC) EN 50178 Electronic Equipment for use in Power Installations						Marked for all applicable European Directives EMC Directive (89/336/EEC) Emissions EN 61800-3 Adjustable Speed electrical power drive systems Part 3 Low Voltage Directive (73/23/EEC) EN 50178 Electronic Equipment for use in Power Installations				
		NA						Certified to AS, EN61800-3: 1996 with A11: 2000				
		TUV Rheinland (applies to frames 1 - 6, 200/400V, and frames 5 & 6, 690V only) TUV Functional Safety Report only for frames 1 - 4, 600V (no FS mark on the label)						TUV functional safety report only (no FS mark on the label)				

Specifications, Cont.

Category	Specification	Frames 1-6 (690V Drive frames 5 & 6 only)	Frames 9 & 10		
Environment	Altitude:	1000 m (3300 ft.) max. without derating	1000 m (3300 ft) max. without derating		
	Surrounding Air Temperature without Derating:		Based on drive rating, refer to Drive Frame chapters		
	Open Type:	0 to 50° C (32 to 122° F)			
	IP20:	0 to 50° C (32 to 122° F)			
	NEMA Type 1:	0 to 40° C (32 to 104 ° F)			
	IP56, NEMA Type 4X:	0 to 40 ° C (32 to 104 ° F) Note: Frames 9 & 10 are rated 0 to 40 ° C (32 to 104 ° F) surrounding air.			
	Storage Temperature (all const.):	-40 to 70° C (-40 to 158° F)	-40 to 70° C (-40 to 158° F)		
	Relative Humidity:	5 to 95% non-condensing	5 to 95% non-condensing		
	Shock:	10G peak for 11 ms duration (± 1.0 ms)	15G peak for 11ms duration (± 1.0 ms)		
	Vibration:	0.152 mm (0.006 in.) displacement, 1G peak, 5.5 Hz	2 mm (0.0787 in.) displacement, 1G peak EN50178 / EN60068-2-6		
Sound	Frame	Fan Speed	Sound Level	Note: Sound pressure level is measured at 2 meters.	
	1	30 CFM	59 dB		
	2	50 CFM	57 dB		
	3	120 CFM	61 dB		
	4	190 CFM	59 dB		
	5	200 CFM	71 dB		
	6	300 CFM	72 dB		
	Atmosphere	Important: Drive must not be installed in an area where the ambient atmosphere contains volatile or corrosive gas, vapors or dust. If the drive is not going to be installed for a period of time, it must be stored in an area where it will not be exposed to a corrosive atmosphere.			
		Important: Drive must not be installed in an area where the ambient atmosphere contains volatile or corrosive gas, vapors or dust. If the drive is not going to be installed for a period of time, it must be stored in an area where it will not be exposed to a corrosive atmosphere.			
Electrical	AC Input Voltage Tolerance:	See "Input Voltage Range/Tolerance" on page 68 for Full Power and Operating Range			
	Frequency Tolerance:	47-63 Hz			
	Input Phases:	Three-phase input provides full rating for all drives. Single-phase operation provides 50% of rated current.			
	DC Input Voltage Tolerance	+/- 10% of Nominal Bus Voltage (above)			
	Displacement Power Factor:	0.98 across speed range			
	Efficiency:	97.5% at rated amps, nominal line volts.			
	Max. Short Circuit Current Rating: Using Recommended Fuse or Circuit Breaker Type	Maximum short circuit current rating to match specified fuse/circuit breaker capability. ≤ 200,000 Amps			
	Maximum Drive to Motor Power Ratio	The drive to motor rating cannot exceed a 2:1 ratio			
		The drive to motor rating cannot exceed a 2:1 ratio			

Specifications, Cont.

Category	Specification	Frames 1-6 (690V Drive frames 5 & 6 only)	Frames 9 & 10
Control	Method Induction Motor: Brushless Motor:	Sine coded PWM with programmable carrier frequency, Indirect Self-Organized, Field-Oriented Control, Current-regulated. Ratings apply to all drives. Refer to the PowerFlex® 700S - Phase I Control Reference Manual, publication PFLEX-RM002, for derating guidelines. The drive can be supplied as 6 pulse or 12 pulse in a configured package.	Sine coded PWM with programmable carrier frequency, Indirect Self-Organized, Field-Oriented Control, Current-regulated. Ratings apply to all drives. Refer to the PowerFlex® 700S - Phase I Control Reference Manual, publication PFLEX-RM002, for derating guidelines. The drive can be supplied as 6 pulse or 12 pulse in a configured package.
	Carrier Frequency	Drive rating: 4 kHz Settings: 2, 4, 8, 10 kHz	Drive rating: 2 kHz Settings: 2, 4, 8, 10 kHz
	Output Voltage Range:	0 to rated motor voltage	0 to rated motor voltage
	Output Frequency Range:	0 – 320 Hz	0 – 320 Hz
	Speed Control	Speed regulation - without feedback 0.1% of base speed across 120:1 speed range 120:1 operating range 50 rad/sec bandwidth	Speed regulation - without feedback 0.1% of base speed across 120:1 speed range 120:1 operating range 50 rad/sec bandwidth
		Speed regulation - with feedback 0.001% of base speed across 120:1 speed range 1000:1 operating range 300 rad/sec bandwidth	Speed regulation - with feedback 0.001% of base speed across 120:1 speed range 1000:1 operating range 300 rad/sec bandwidth
	Torque Regulation	Torque Regulation - without feedback +/-10%, 600 rad/sec bandwidth	Torque Regulation - without feedback +/-10%, 600 rad/sec bandwidth
		Torque Regulation - with feedback +/-2%, 2500 rad/sec bandwidth	Torque Regulation - with feedback +/-5%, 2500 rad/sec bandwidth
	Selectable Motor Control:	Field Oriented Control with and without a feedback device and permanent magnet motor control	Field Oriented Control with and without a feedback device and permanent magnet motor control
	Stop Modes:	Multiple programmable stop modes including – Ramp, Coast and Current Limit	Multiple programmable stop modes including – Ramp, Coast and Current Limit
	Accel/Decel	Independently programmable accel and decel times adjustable from 0 to 6553.5 in 0.1 second increments.	Independently programmable accel and decel times adjustable from 0 to 6553.5 in 0.1 second increments.
	S-Curve Time	Adjustable from 0.5 to 4.0 seconds	Adjustable from 0.5 to 4.0 seconds
	Intermittent Overload:	110% Overload capability for up to 1 minute 150% Overload capability for up to 3 seconds	110% Overload capability for up to 1 minute 150% Overload capability for up to 3 seconds
	Current Limit Capability:	Independent Motoring and Regenerative Power Limits programmable to 800% of rated output current	Independent Motoring and Regenerative Power Limits programmable to 800% of rated output current
	Electronic Motor Overload Protection	Class 10 protection with speed sensitive response. Investigated by U.L. to comply with N.E.C. Article 430 U.L. File E59272, volume 12.	Class 10 protection with speed sensitive response. Investigated by U.L. to comply with N.E.C. Article 430 U.L. File E59272, volume 12.

Specifications, Cont.

Category	Specification	Frames 1-6 (690V Drive frames 5 & 6 only)	Frames 9 & 10
Feedback	<p>Encoder Inputs (2): Dual Channel Plus Marker, Isolated with differential transmitter Output (Line Drive) Incremental, Dual Channel Quadrature type</p> <p>Encoder Voltage Supply: 5V DC or 12 V DC 320 mA/channel 5V DC minimum high state voltage of 3.0 VDC, maximum low voltage state of 0.4V DC. 12 V DC minimum high state voltage of 7.0V DC, maximum low state voltage of 0.4V DC</p> <p>Maximum Input Frequency: 400 kHz</p>	<p>Dual Channel Plus Marker, Isolated with differential transmitter Output (Line Drive) Incremental, Dual Channel Quadrature type</p> <p>5V DC or 12 V DC 320 mA/channel 5V DC minimum high state voltage of 3.0 VDC, maximum low voltage state of 0.4V DC. 12 V DC minimum high state voltage of 7V DC, maximum low state voltage of 0.4V DC</p> <p>500 kHz</p>	<p>Dual Channel Plus Marker, Isolated with differential transmitter Output (Line Drive) Incremental, Dual Channel Quadrature type</p> <p>5V DC or 12 V DC 320 mA/channel 5V DC minimum high state voltage of 3.0 VDC, maximum low voltage state of 0.4V DC. 12 V DC minimum high state voltage of 7V DC, maximum low state voltage of 0.4V DC</p> <p>500 kHz</p>
	<p>Stegmann Option:</p> <p>Encoder Voltage Supply: 11.5V DC @ 130 mA</p> <p>Hi-Resolution Feedback: Sine/Cosine 1V P-P Offset 2.5</p> <p>Maximum Cable Length: 182 m (600 ft.)</p> <p>RS-485 Interface:</p> <p>Customer-I/O Plug (P1) - Hi Res:</p> <p>Allen-Bradley PN: S94262912 Weidmuller PN: BL3.50/90/12BK</p>		<p>11.5V DC @ 130 mA</p> <p>Sine/Cosine 1V P-P Offset 2.5</p> <p>182 m (600 ft.)</p> <p>Hi-Resolution Feedback Option card obtains the following information via the Hiperface RS-485 interface shortly after power-up: Address, Command Number, Mode, Number of turns, Number of Sine/Cos cycles, Checksum</p> <p>Allen-Bradley PN: S94262912 Weidmuller PN: BL3.50/90/12BK</p>
	<p>Resolver Option:</p> <p>Excitation Frequency: 2400 Hz</p> <p>Excitation Voltage: 4.25-26 Vrms</p> <p>Operating Frequency Range: 1 - 10 kHz</p> <p>Resolver Feedback Voltage: 2V ± 300 mV</p> <p>Maximum Cable Length: 304.8 meters (1000 ft.)</p>		<p>2400 Hz</p> <p>4.25-26 Vrms</p> <p>1 - 10 kHz</p> <p>2V ± 300 mV</p> <p>304.8 meters (1000 ft.)</p>
DriveLogix	<p>User Available MemoryBase: 256 kbytes</p> <p>With Memory Expansion Board: 768 kbytes</p> <p>Battery: 1756-BA1 (Allen-Bradley PN 94194801) 0.59g lithium</p> <p>Serial Cable:</p> <ul style="list-style-type: none"> 1761-CBLPM02 to 1761-NET-AIC 1761-CBLPA00 to 1761-NET-AIC 1756-CP3 directly to controller 1747-CP3 directly to controller category 3 (2) <p>Flex I/O Connection: Up to (8) modules</p> <p>FLEXBUS Current Output: 640 mA maximum @ 5.1V dc</p> <p>Cable: 4100-CCF3</p>	<p>256 kbytes</p> <p>768 kbytes</p> <p>1756-BA1 (Allen-Bradley PN 94194801) 0.59g lithium</p> <p>1761-CBLPM02 to 1761-NET-AIC</p> <p>1761-CBLPA00 to 1761-NET-AIC</p> <p>1756-CP3 directly to controller</p> <p>1747-CP3 directly to controller</p> <p>category 3 (2)</p> <p>Up to (8) modules</p> <p>640 mA maximum @ 5.1V dc</p> <p>4100-CCF3</p>	<p>1756-BA1 (Allen-Bradley PN 94194801) 0.59g lithium</p> <p>1761-CBLPM02 to 1761-NET-AIC</p> <p>1761-CBLPA00 to 1761-NET-AIC</p> <p>1756-CP3 directly to controller</p> <p>1747-CP3 directly to controller</p> <p>category 3 (2)</p> <p>Up to (8) modules</p> <p>640 mA maximum @ 5.1V dc</p> <p>4100-CCF3</p>

Input Voltage Range/Tolerance

Drive Rating	Nominal Line Voltage	Nominal Motor Voltage	Drive Full Power Range	Drive Operating Range
200-240	200	200†	200-264	180-264
	208	208	208-264	
	240	230	230-264	
380-400	380	380†	380-528	342-528
	400	400	400-528	
	480	460	460-528	
500-600 (Frames 1-4 Only)	600	575†	575-660	432-660
500-690 (Frames 5 & 6 Only)	600	575†	575-660	475-759
	690	690	690-759	475-759

Drive Full Power Range = Nominal Motor Voltage to Drive Rated Voltage + 10%.
Rated current is available across the entire Drive Full Power Range

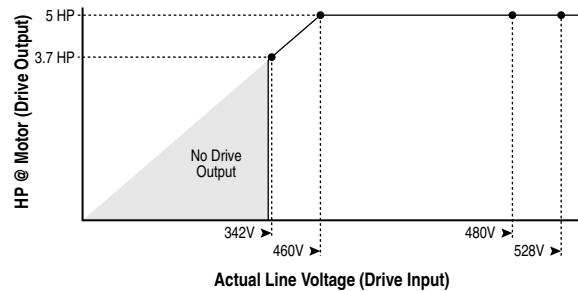
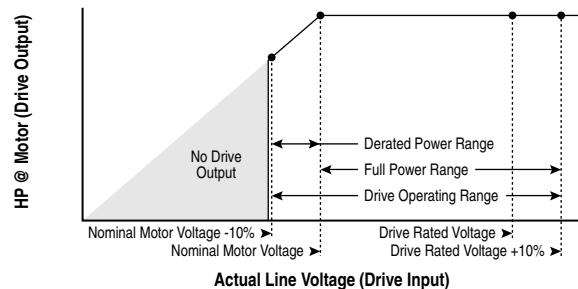
Drive Operating Range = Lowest† Nominal Motor Voltage - 10% to Drive Rated Voltage + 10%.
Drive Output is linearly derated when Actual Line Voltage is less than the Nominal Motor Voltage

Example:

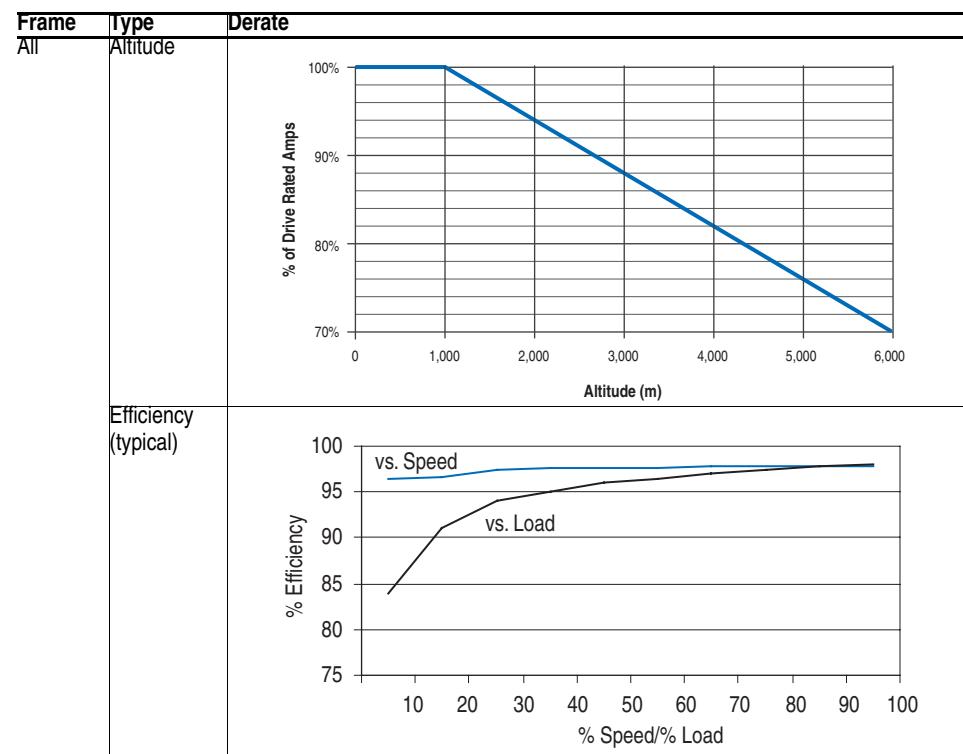
Calculate the maximum power of a 5 HP, 460V motor connected to a 480V rated drive supplied with 342V Actual Line Voltage input.

- Actual Line Voltage / Nominal Motor Voltage = 74.3%
- $74.3\% \times 5 \text{ HP} = 3.7 \text{ HP}$
- $74.3\% \times 60 \text{ Hz} = 44.6 \text{ Hz}$

At 342V Actual Line Voltage, the maximum power the 5 HP, 460V motor can produce is 3.7 HP at 44.6 Hz.



Altitude Derating



Carrier Derating

Frame	Voltage	ND Rating	Enclosure	Frequency [●]	Derate																																
1	400V	11 kW	<ul style="list-style-type: none"> • Open • NEMA Type1 • IP20 	6-10kHz	<table border="1"> <caption>Data for Frame 1, 400V, 11kW, 6-10kHz</caption> <thead> <tr> <th>% of Output FLA</th> <th>6 kHz (°C)</th> <th>8 kHz (°C)</th> <th>10 kHz (°C)</th> </tr> </thead> <tbody> <tr><td>40</td><td>50</td><td>50</td><td>50</td></tr> <tr><td>50</td><td>50</td><td>50</td><td>50</td></tr> <tr><td>60</td><td>48</td><td>48</td><td>48</td></tr> <tr><td>70</td><td>46</td><td>46</td><td>46</td></tr> <tr><td>80</td><td>44</td><td>44</td><td>44</td></tr> <tr><td>90</td><td>42</td><td>42</td><td>42</td></tr> <tr><td>100</td><td>40</td><td>35</td><td>30</td></tr> </tbody> </table>	% of Output FLA	6 kHz (°C)	8 kHz (°C)	10 kHz (°C)	40	50	50	50	50	50	50	50	60	48	48	48	70	46	46	46	80	44	44	44	90	42	42	42	100	40	35	30
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460V	15 HP	<ul style="list-style-type: none"> • Open • NEMA Type1 • IP20 	6-10kHz	<table border="1"> <caption>Data for Frame 1, 460V, 15HP, 6-10kHz</caption> <thead> <tr> <th>% of Output FLA</th> <th>6 kHz (°C)</th> <th>8 kHz (°C)</th> <th>10 kHz (°C)</th> </tr> </thead> <tbody> <tr><td>40</td><td>50</td><td>50</td><td>50</td></tr> <tr><td>50</td><td>50</td><td>50</td><td>50</td></tr> <tr><td>60</td><td>48</td><td>48</td><td>48</td></tr> <tr><td>70</td><td>46</td><td>46</td><td>46</td></tr> <tr><td>80</td><td>44</td><td>44</td><td>44</td></tr> <tr><td>90</td><td>42</td><td>42</td><td>42</td></tr> <tr><td>100</td><td>40</td><td>30</td><td>20</td></tr> </tbody> </table>	% of Output FLA	6 kHz (°C)	8 kHz (°C)	10 kHz (°C)	40	50	50	50	50	50	50	50	60	48	48	48	70	46	46	46	80	44	44	44	90	42	42	42	100	40	30	20	
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2	400V	15kW	<ul style="list-style-type: none"> • Open • NEMA Type1 • IP20 	8-10kHz	<table border="1"> <caption>Data for Frame 2, 400V, 15kW, 8-10kHz</caption> <thead> <tr> <th>% of Output FLA</th> <th>8 kHz (°C)</th> <th>10 kHz (°C)</th> </tr> </thead> <tbody> <tr><td>40</td><td>50</td><td>50</td></tr> <tr><td>50</td><td>50</td><td>50</td></tr> <tr><td>60</td><td>50</td><td>50</td></tr> <tr><td>70</td><td>50</td><td>50</td></tr> <tr><td>80</td><td>50</td><td>50</td></tr> <tr><td>85</td><td>50</td><td>50</td></tr> <tr><td>90</td><td>48</td><td>48</td></tr> <tr><td>95</td><td>45</td><td>45</td></tr> <tr><td>100</td><td>40</td><td>40</td></tr> </tbody> </table>	% of Output FLA	8 kHz (°C)	10 kHz (°C)	40	50	50	50	50	50	60	50	50	70	50	50	80	50	50	85	50	50	90	48	48	95	45	45	100	40	40		
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460V	20 HP	<ul style="list-style-type: none"> • Open • NEMA Type1 • IP20 	10 kHz	<table border="1"> <caption>Data for Frame 2, 460V, 20HP, 10kHz</caption> <thead> <tr> <th>% of Output FLA</th> <th>Temp (°C)</th> </tr> </thead> <tbody> <tr><td>40</td><td>50</td></tr> <tr><td>50</td><td>50</td></tr> <tr><td>60</td><td>50</td></tr> <tr><td>70</td><td>50</td></tr> <tr><td>80</td><td>50</td></tr> <tr><td>85</td><td>50</td></tr> <tr><td>90</td><td>48</td></tr> <tr><td>95</td><td>44</td></tr> <tr><td>100</td><td>40</td></tr> </tbody> </table>	% of Output FLA	Temp (°C)	40	50	50	50	60	50	70	50	80	50	85	50	90	48	95	44	100	40													
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	25 HP	<ul style="list-style-type: none"> • Open • NEMA Type1 • IP20 	6-10 kHz	<table border="1"> <caption>Data for Frame 2, 25HP, 6-10kHz</caption> <thead> <tr> <th>% of Output FLA</th> <th>6 kHz (°C)</th> <th>8 kHz (°C)</th> <th>10 kHz (°C)</th> </tr> </thead> <tbody> <tr><td>40</td><td>50</td><td>50</td><td>50</td></tr> <tr><td>50</td><td>50</td><td>50</td><td>50</td></tr> <tr><td>60</td><td>48</td><td>48</td><td>48</td></tr> <tr><td>70</td><td>46</td><td>46</td><td>46</td></tr> <tr><td>80</td><td>44</td><td>44</td><td>44</td></tr> <tr><td>90</td><td>42</td><td>42</td><td>42</td></tr> <tr><td>100</td><td>40</td><td>20</td><td>10</td></tr> </tbody> </table>	% of Output FLA	6 kHz (°C)	8 kHz (°C)	10 kHz (°C)	40	50	50	50	50	50	50	50	60	48	48	48	70	46	46	46	80	44	44	44	90	42	42	42	100	40	20	10	
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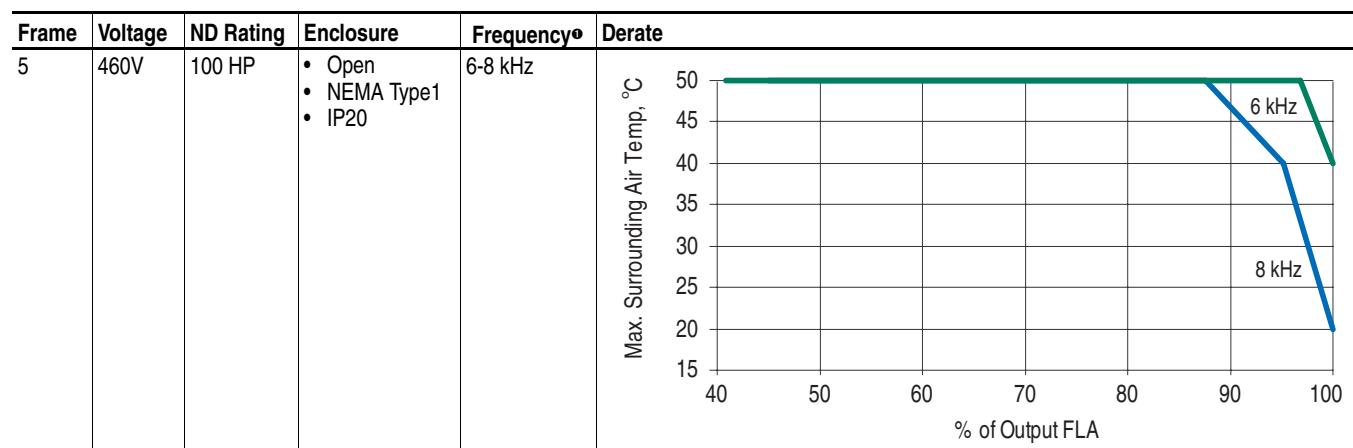
● Consult the factory for further derate information at other frequencies.

Carrier Derating, Cont'd

Frame	Voltage	ND Rating	Enclosure	Frequency*	Derate
3	400V	18.5 kW	<ul style="list-style-type: none"> • Open • NEMA Type1 • IP20 	6-10 kHz	<p>Max. Surrounding Air Temp. °C</p> <p>% of Output FLA</p> <p>6 kHz 8 kHz 10 kHz</p>
		30 kW	<ul style="list-style-type: none"> • Open • NEMA Type1 • IP20 	6-10 kHz	<p>Max. Surrounding Air Temp. °C</p> <p>% of Output FLA</p> <p>6 kHz 8 kHz 10 kHz</p>
		37 kW	<ul style="list-style-type: none"> • Open • NEMA Type1 • IP20 	4-10 kHz	<p>Max. Surrounding Air Temp. °C</p> <p>% of Output FLA</p> <p>4 kHz 6 kHz 8 kHz 10 kHz</p>
460V	40 HP	40 HP	<ul style="list-style-type: none"> • Open • NEMA Type1 • IP20 	6-10 kHz	<p>Max. Surrounding Air Temp. °C</p> <p>% of Output FLA</p> <p>6 kHz 8 kHz 10 kHz</p>
		50 HP	<ul style="list-style-type: none"> • Open • NEMA Type1 • IP20 	6-10 kHz	<p>Max. Surrounding Air Temp. °C</p> <p>% of Output FLA</p> <p>6 kHz 8 kHz 10 kHz</p>

*Consult the factory for further derate information at other frequencies.

Carrier Derating, Cont'd



[●]Consult the factory for further derate information at other frequencies.

Carrier Derating, Cont'd

Frame	Ambient Temp.	Voltage	Frequency ^❶	Rated Amps	Rated Amps	Derate
9	40° C	400V	PWM	@ 300	@ 261	
			1.0 kHz	300	261	
			2.2 kHz	300	261	
			3.2 kHz	261	261	
			3.6 kHz	248	248	
			6.8 kHz	173	173	
			10.0 kHz	129	129	
		600V	PWM	@ 208	@ 170	
			1.0 kHz	208	170	
			1.5 kHz	208	170	
			1.9 kHz	208	170	
			2.7 kHz	170	170	
			3.0 kHz	158	158	
			3.6 kHz	140	140	
			4.2 kHz	125	125	
			4.5 kHz	117	117	
			6.0 kHz	92	92	

❶Consult the factory for further derate information at other frequencies.

Carrier Derating, Cont'd

Frame	Ambient Temp.	Voltage	Frequency ^①	Irated Amps	Irated Amps	Irated Amps	Derate
10	40° C	400V	PWM	@500	@ 460	@ 385	
			1.0 kHz	500	460	385	
			2.4 kHz	500	460	385	
			2.75 kHz	500	460	385	
			3.6 kHz	460	460	385	
			5.4 kHz	385	385	385	
			6.8 kHz	342	342	342	
			10.0 kHz	270	270	270	

^①Consult the factory for further derate information at other frequencies.

Frame	Ambient Temp.	Voltage	Frequency ^①	Irated Amps	Irated Amps	Irated Amps	Irated Amps	Derate
10	40° C	600V	PWM	@ 416	@ 385	@ 325	@ 261	
			1.0 kHz	416	385	325	261	
			1.5 kHz	416	385	325	261	
			1.6 kHz	416	385	325	261	
			2.0 kHz	385	385	325	261	
			2.8 kHz	325	325	325	261	
			3.0 kHz	312	312	312	261	
			4.0 kHz	261	261	261	261	
			4.5 kHz	243	243	243	243	
			6.0 kHz	193	193	193	193	

^①Consult the factory for further derate information at other frequencies.

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