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SOLVE.®

PRODUCT PROFILE

PowerFlex® 700 AC Drive

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Powerful Performance. Flexible Control.

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Whether your application requires simple speed control, demanding torque control, or a variety of horse power ratings, the PowerFlex® 700 AC drive offers the most outstanding performance found in a general purpose drive.

The PowerFlex 700 AC drive is available from .37 to 500 kW/0.5 to 700 HP and is easier to use than any other drive in its class while offering the world-class performance that you have come to expect from the PowerFlex family.

Excellent Performance

- Three control modes in one drive: Vector Control with Force™ Technology, Sensorless Vector and V/Hz control.
- Outstanding open or closed loop speed regulation for applications ranging from fans and pumps to precise control of winders.
- Excellent torque production and tight torque regulation for the most demanding applications like extruders and web processes.
- Fast update times of torque inputs are suitable for high performance applications.

Saves Space

- Innovative bookshelf design of frames 0-6 means drives that are up to 68% smaller than other global drives.
- Bookshelf design optimizes panel space by allowing Zero Stacking™ or side-by-side mounting of the drives. In many cases, twice as many drives can be packaged in the same panel space as competitive products.
- Save panel space and wiring time with internal brake transistors, integral EMC filters, and integral common mode chokes (Frame 0-6), as well as communication and feedback options.



PowerFlex 700 AC Drive (0.37 to 500 kW; 0.5 to 700 HP)

Easy-to-Use Control

- Full-featured LCD Human Interface Module (HIM) with multi-line and multi-lingual display simplifies programming.
- S.M.A.R.T Start and Detailed Assisted Start-up routines in the LCD HIM allow for easy configuring and tuning of the drive.
- Pull-apart control terminal blocks allow for easy wiring and quick disconnect!
- Frames 0-6 control board and I/O are mounted in a cassette, that also houses the encoder option, mounted alongside the drive for easy access.
- Frames 7-10 have the same control board as frames 0-6 installed directly into drive.
- Optimized global voltage settings designed to worldwide standards allow quick set-up anywhere in the world.
- Excellent PC software tools, such as DriveExplorer™, DriveTools™ SP and RSLogix 5000™ make configuring, programming, monitoring and troubleshooting even easier.

Premier Integration with PowerFlex Drives

For simplified drive start-up and reduced development time, the AC family of Allen-Bradley PowerFlex drives can be configured with RSLogix 5000 software. This single software approach simplifies parameter and tag programming while still allowing stand-alone drive software tool use on the factory floor.

PowerFlex 700 Vector Control – Series B

The Vector Control Cassette includes three control modes (Vector Control with Force™ Technology, Sensorless Vector and V/Hz) which will easily meet most application needs.

Control Features:

- Accurate torque regulation
- Precise speed control (open or closed loop)
- Encoder feedback / pulse input (optional)
- DC Bus regulation
- Slip compensation or droop control
- Advanced flying start (instantaneous)
- Process PI loop
- Six digital & two high speed analog inputs
- Three digital and two analog outputs
- PTC Input
- Dedicated enable (selectable)
- Programming flexibility (parameter links)
- Inertia Ride-Through
- Fast Braking (fast stopping w/o brake resistors)
- Dynamic user sets
- Security options
- Assisted start-up and application specific set-up menus

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- 1 Encoder Interface**
This Vector Control option provides an interface for a 5/12-volt pulse encoder.
- 2 Internal Common Mode Cores***
No additional external cores are required to keep common mode noise from disrupting sensitive electronics. Eliminating external core installation saves labor costs and panel space.
- 3 Wiring**
Clearly marked, conveniently placed terminal blocks provide direct access for power and control wiring. Control blocks are “pull apart” for added convenience.
- 4 Integral Dynamic Brake***
Standard chopper transistor and available drive-mounted (or separate mounting) braking resistor provide cost-effective dynamic brake options.
- 5 Internal EMC Filter***
Meets environmental standards without requiring additional panel space.
- 6 Multi-Color LED's**
Status indications are visible with all covers installed to simplify diagnostics.
- 7 Human Interface Module**
A flexible LCD Human Interface Module provides exceptional information display and programming ease in a multi-lingual format.
- 8 Internal Communications**
Allows the user to integrate the drive into the manufacturing process. Status indicators for all internal communication options are visible on the cover for easy setup and monitoring of drive communications.

* Applies to PowerFlex 700 frames 0-6.

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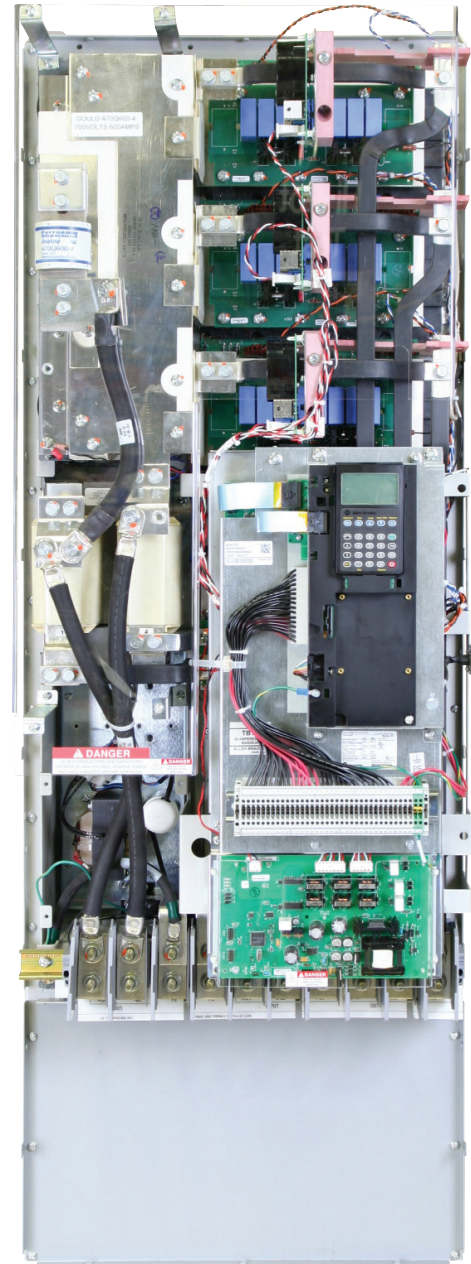
Flexible Packaging Options

- Along with IP20/UL Type 1 (NEMA 1) package options, the PowerFlex 700 drive is also available in IP54/UL Type 12 (NEMA 12) Flange mount and Stand-alone packages (75-200HP).
- IP00/NEMA Open 250-700HP can be mounted with heat-sink out the back and packaged to meet IP54/UL Type 12.
- IP20 drive package configuration for Frames 8-10 comes in MCC-style enclosures.
- The Configured Drives Program simplifies installation and start-up of the PowerFlex 700 AC drive by allowing users to order drive packages that combine operator interface, control, communications and power options in pre-configured assemblies. Offering a number of commonly requested pre-engineered options, as well as more complex packages, Standard Packaged Drives provide a wide range of motor control options.

Communications

The Allen-Bradley® PowerFlex family of drives utilizes Rockwell Automation's NetLinx Open Network Architecture. This provides the common set of features and services for DeviceNet™, ControlNet™ and EtherNet/IP™ networks resulting in lower total cost of ownership. Users can easily manage information from shop floor to top floor and seamlessly integrate their complete system as they control, configure and collect data.

- PowerFlex drives offer internal communication options helping the user to cost-effectively assemble highly integrated applications. Options include: DeviceNet, ControlNet, Universal Remote I/O, and other open communications including Profibus™ and Interbus-S.
- Status indicators for all internal communications options are visible on the cover for easy set-up and monitoring of drive communications.



PowerFlex 700 Frame 7

Human Interface Modules

The LCD Human Interface Module (HIM) supports full multi-lingual text for grouping, parameter descriptions, programming, troubleshooting and start-up in a 7-line by 21-character display. It also offers keypad options in a variety of combinations that can include digital speed control, programming keys, control keys and a full numeric keypad.





Outstanding Vector Control

Do you have a demanding application? Many applications that previously required encoder feedback can be run open loop with performance results exceeding your application's requirements. Allen-Bradley's patented Force Technology delivers accurate and reliable torque regulation and speed control regardless of whether the motor is hot or cold.

Low Noise

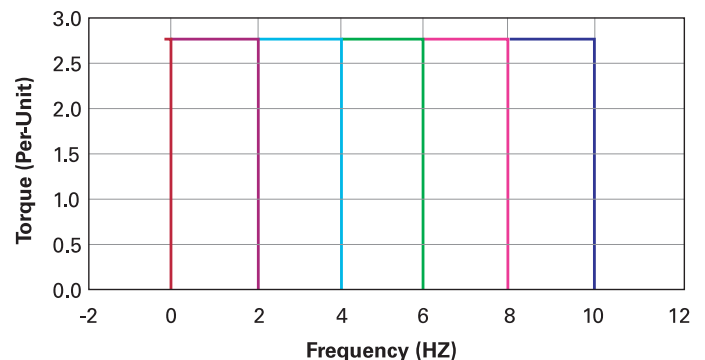
You no longer have to worry about noise or standards compliance. The world-class PowerFlex 700 AC drive (frames 0-6) is designed to meet CE certification and stringent EMC standards without added filtering. Not only does this save you valuable panel space, but it also eliminates any of your concerns regarding compliance.

Additionally, PowerFlex 700 drives have internal common mode cores on the output leads. This helps reduce common mode noise that can be problematic to other components in your system.

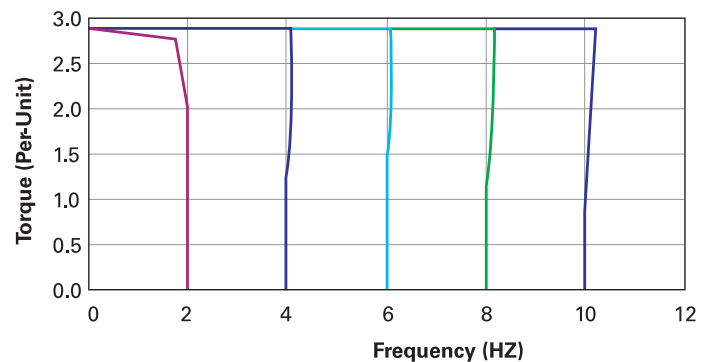
Motor Friendly

Are voltage spikes caused by transistors switching into long motor cables damaging your motor? The PowerFlex 700 drive is the industry leader in protecting your motor from damage due to reflected wave phenomenon. Over the past decade, Rockwell Automation has pioneered the investigation and resolution of this reflected wave phenomenon. This has resulted in proprietary and patented reflected wave reduction algorithms and hardware solutions - both internal to the drive as well as external. No other manufacturer has done more to protect your induction motors from premature failures.

PowerFlex 700 Drive with Vector Control and Encoder



PowerFlex 700 Drive with Vector Control - Encoderless



Integrated Software

For simplified AC drive start-up and reduced development time, we've integrated Allen-Bradley PowerFlex drive configuration with RSLogix5000® software. This single-software approach simplifies parameter and tag programming while still allowing stand-alone drive software tool use on the factory floor.

DriveTools™ SP Software Suite

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



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

DriveExplorer™ Software



Allen-Bradley DriveExplorer software is an easy-to-use, cost effective online programming tool designed for Microsoft® Windows™ 95/98, Windows NT™ (4.0 or greater) and Windows CE (2.0 or 2.11) operating systems. It provides the user with the means to monitor and configure PowerFlex drive and communication adapter parameters.

Assured Network Connectivity

PowerFlex 700 drives and options are put through an extensive suite of tests to assure compatibility with other Allen-Bradley products from PLCs to PanelViews™. Rockwell Automation offers a wide breadth of communication options along with outstanding network reliability unmatched in the industry.



Application Features

The PowerFlex 700 drives include several features to solve the toughest applications. These include Position Indexing/Speed Profiling, TorqProve™, Oil Pump and Adjustable Voltage Control.

TorqProve™ for Lifting Application:

- Torque Proving (includes Flux Up and Last Torque measurement)
 - Brake Proving (includes mode to slowly lower load if brake slips or fails)*
 - Float Capability*
 - Micro Positioning
 - Load-based speed limits (allows fast unloaded speeds)
 - End and Deceleration Limit Switch inputs
 - Fast Stop
 - Encoder and Encoderless operation
 - Speed Deviation Fault, Output Phase Loss Fault, Encoder Loss Fault
 - Assisted Start-up for easy commissioning
 - Designed to comply with CMAA Specification #70
- * Available with encoder only – see manual for encoderless restrictions.

Position Indexing / Speed Profiling:

Uses a 16 step array to provide:

- Point-to-point positioning – either absolute or incremental moves (referenced to home position)
- Velocity profiling based on encoder counts, digital inputs, time or parameter levels
- Homing capability
- Blend moves

Applications:

The advanced features of the PowerFlex 700 drive, make it ideal for the following applications:

- Fans & pumps
- Mixers
- Conveyors & palletizers
- Demanding extruders
- Web handling / Tension control
- Lifts / Hoists
- Centrifuges
- Vibration welding
- Induction heating
- Power supplies
- Linear motors
- Pump jacks and PC pumps
- Stamping presses
- Bottling lines
- Test stands

200V/240V

Output Power		200 Volt Class			240 Volt Class			Frame Size
		Output Current, Amps			Output Current, Amps			
kW ND (HD)	HP ND (HD)	Cont. ND (HD)	1 min. ND (HD)	3 sec. ND (HD)	Cont. ND (HD)	1 min. ND (HD)	3 sec. ND (HD)	
0.37 (0.25)	0.5 (0.33)	2.5	2.8	3.8	2.2	2.4	3.3	0
0.75 (0.55)	1 (0.75)	4.8	5.6	7.0	4.2	4.8	6.4	0
1.5 (75)	2 (1.5)	7.8	10.4	13.8	6.8	9.0	12.0	1
2.2 (1.5)	3 (2)	11	12.1	17.0	9.6	10.6	14.4	1
4 (2.2)	5 (3)	17.5	19.3	26.3	15.3	16.8	23.0	1
5.5 (4)	7.5 (5)	25.3	27.8	38.0	22.0	24.2	33.0	1
7.5 (5.5)	10 (7.5)	32.2	38.0	50.6	28.0	33.0	44.0	2
11 (7.5)	15 (10)	48.3	53.1	72.5	42.0	46.2	63.0	3
15 (11)	20 (15)	56.0	64.0	86.0	52.0	63.0	80.0	3
18.5 (15)	25 (20)	78.2	86.0	117.3	70.0	78.0	105.0	4
22 (18.5)	30 (25)	92.0	117.3	156.4	80.0	105.0	136.0	4
30 (22)	40 (30)	120 (92)	132 (138)	175 (175)	104 (80)	115 (120)	175 (160)	5
37 (30)	50 (40)	130 (104)	143 (156)	175 (175)	104 (130)	143 (156)	175 (175)	5
45 (37)	60 (50)	177 (150)	195 (225)	266 (300)	154 (130)	169 (195)	231 (260)	6
55 (45)	75 (60)	221 (177)	243 (266)	308 (308)	192 (154)	211 (231)	288 (308)	6
75 (55)	100 (75)	260 (205)	286 (305)	390 (410)	260 (205)	286 (305)	390 (410)	6

400V/480V

Output Power		400 Volt Class			480 Volt Class			Frame Size
		Output Current, Amps			Output Current, Amps			
kW ND (HD)	HP ND (HD)	Cont. ND (HD)	1 min. ND (HD)	3 sec. ND (HD)	Cont. ND (HD)	1 min. ND (HD)	3 sec. ND (HD)	
0.37 (0.25)	0.5 (0.33)	1.3	1.4	1.9	1.1	1.2	1.6	0
0.75 (0.55)	1 (0.75)	2.1	2.4	3.2	2.1	2.4	3.2	0
1.5 (75)	2 (1.5)	3.5	4.5	6.0	3.4	4.5	6.0	0
2.2 (1.5)	3 (2)	5.0	5.5	7.5	5.0	5.5	7.5	0
4 (2.2)	5 (3)	8.7	9.9	13.2	8.0	8.8	12.0	0
5.5 (4)	7.5 (5)	11.5	13.0	17.4	11.0	12.1	16.5	0
7.5 (5.5)	10 (7.5)	15.4	17.2	23.1	14.0	16.5	22.0	1
11 (7.5)	15 (10)	22.0	24.2	33.0	22.0	24.2	33.0	1
15 (11)	20 (15)	30.0	33.0	45.0	27.0	33.0	44.0	2
18.5 (15)	25 (20)	37.0	45.0	60.0	34.0	40.5	54.0	2
22 (18.5)	30 (25)	43.0	55.5	74.0	40.0	51.0	68.0	3
30 (22)	40 (30)	56.0	64.5	86.0	52.0	60.0	80.0	3
37 (30)	50 (40)	72.0	84.0	112.0	65.0	78.0	104.0	3
45 (37)	60 (50)	85 (72)	94 (108)	128 (144)	77 (65)	85 (98)	116 (130)	4
55 (45)	75 (60)	105 (85)	116 (128)	154 (170)	96 (77)	106 (116)	144 (154)	5
55 (45)	100 (75)	125 (96)	138 (144)	163 (168)	125 (96)	138 (144)	163 (168)	5
75 (55)	—	140 (105)	154 (157)	190 (190)	—	—	—	—
90 (75)	125 (100)	170 (140)	187 (210)	255 (280)	156 (125)	172 (188)	233 (250)	6
110 (90)	150 (125)	205 (170)	220 (255)	300 (340)	180 (156)	198 (234)	270 (312)	6
132 (110)	200 (150)	260 (205)	286 (308)	390 (410)	248 (180)	273 (270)	372 (360)	6
160 (150)	250 (200)	292 (263)	322 (395)	438 (526)	292 (263)	322 (395)	438 (526)	7
180 (180)	250 (250)	325 (325)	358 (488)	488 (650)	325 (325)	358 (488)	488 (650)	7
200 (180)	300 (250)	365 (325)	402 (488)	548 (650)	365 (325)	402 (488)	548 (650)	8
240 (200)	350 (300)	415 (365)	457 (548)	623 (730)	415 (365)	457 (548)	623 (730)	8
280 (240)	400 (350)	481 (415)	530 (623)	722 (830)	481 (415)	530 (623)	722 (830)	8
300 (280)	450 (400)	535 (481)	589 (722)	803 (962)	535 (481)	589 (722)	803 (962)	8
350 (300)	500 (450)	600 (535)	666 (803)	908 (1070)	600 (535)	666 (803)	908 (1070)	8
400 (350)	600 (500)	730 (600)	803 (900)	1095 (1200)	730 (600)	803 (900)	1095 (1200)	9
500 (400)	700 (600)	875 (700)	963 (1050)	1313 (1400)	875 (700)	963 (1050)	1313 (1400)	10

600V/690V

Output Power		600 Volt Class			690 Volt Class			Frame Size
		Output Current, Amps			Output Current, Amps			
kW ND (HD)	HP ND (HD)	Cont. ND (HD)	1 min. ND (HD)	3 sec. ND (HD)	Cont. ND (HD)	1 min. ND (HD)	3 sec. ND (HD)	
0.75 (0.55)	1 (0.75)	1.7	2.0	2.6	N/A	—	—	0
1.5 (75)	2 (1.5)	2.7	3.6	4.8	N/A	—	—	0
2.2 (1.5)	3 (2)	3.9	4.3	5.9	N/A	—	—	0
4 (2.2)	5 (3)	6.1	6.7	9.2	N/A	—	—	0
5.5 (4)	7.5 (5)	9.0	9.9	13.5	N/A	—	—	0
7.5 (5.5)	10 (7.5)	11	13.5	18	N/A	—	—	1
11 (7.5)	15 (10)	17	18.7	25.5	N/A	—	—	1
15 (11)	20 (15)	22	25.5	34	N/A	—	—	2
18.5 (15)	25 (20)	27	33	44	N/A	—	—	2
22 (18.5)	30 (25)	32	40.5	54	N/A	—	—	3
30 (22)	40 (30)	41	48	64	N/A	—	—	3
37 (30)	50 (40)	52	61.5	82	N/A	—	—	3
45 (37)	60 (50)	62	78	104	N/A	—	—	4
45 (37)	—	—	—	—	52 (46)	57 (69)	78 (92)	5
55 (45)	—	—	—	—	60 (52)	66 (78)	90 (104)	5
75 (55)	75 (60)	77 (63)	85 (94)	116 (126)	82 (60)	90 (90)	120 (123)	5
90 (75)	100 (75)	99 (77)	109 (116)	126 (138)	98 (82)	108 (123)	127 (140)	5
110 (90)	125 (100)	125 (99)	138 (149)	188 (198)	119 (98)	131 (147)	179 (196)	6
132 (110)	150 (125)	144 (125)	158 (188)	216 (250)	142 (119)	156 (179)	213 (238)	6

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NEMA 1 Dimensions mm (in)

Frame Size	Dimensions		
	Height mm (in.)	Width mm (in.)	Depth mm (in.)
0	336 (13.23)	110 (4.33)	200 (7.87)
1	336 (13.23)	135 (5.31)	200 (7.87)
2	342.5 (13.48)	222 (8.74)	200 (7.87)
3	517.5 (20.37)	222 (8.74)	200 (7.87)
4	758.9 (29.88)	219.8 (8.65)	201.6 (7.94)
5	644.5 (25.37) ¹	308.9 (12.16)	275.4 (10.84)
6	850 (33.46) ²	403.9 (15.90)	275.5 (10.85)
7	1498.6 (59.00)	514.4 (20.25)	406.9 (16.02)
8	300-400 HP 2374 (93.5)	75.7 (29.83)	889 (35)
8	450-500 HP 2374 (93.5)	75.7 (29.83)	1016 (40)
9	2374 (93.5)	75.7 (29.83)	1016 (40)
10	2374 (93.5)	1267.7 (49.91)	889 (35)

Notes:

- When using the supplied junction box (100 HP drives Only), add an additional 45.1 mm (1.78 in.) to this dimension.
- When using the supplied junction box, add an additional 126.3 mm (4.97 in.) to this dimension.

NEMA Type Open/IP00/Flange Mount and Stand alone NEMA 12/IP54

Frame Size		Height mm (in.)	Width mm (in.)	Depth mm (in.)
5	Standalone	1574.8 (62.0)	609.6 (24.0)	450.7 (17.75)
5	Flange Mount	1061.0 (41.77)	500.0 (19.69)	400.6 (15.77)
6	Standalone	1828.8 (72.0)	711.3 (28.0)	487.8 (19.20)
6	Flange Mount	1100.0 (43.3)	584.0 (23.0)	426.3 (16.8)
7	IP00*	1498.6 (59.00)	514.4 (20.25)	406.9 (16.02)
8	IP00* (300-400 HP)	2275.8 (89.60)	757.7 (29.83)	599.2 (23.59)
8	IP00* (450-500 HP)	2275.8 (89.60)	757.7 (29.83)	726.2 (28.59)
9	IP00*	2275.8 (89.60)	757.7 (29.83)	781.8 (30.78)
10	IP00*	2275.8 (89.6)	1267.7 (49.91)	889 (35)

*Heatsink-out-the-back; heatsink is rated IP54/NEMA 12

Standards

- CSA/cUL
- UL *
- C-Tick, IEC 61800-3
- ATEX
- NFPA 70 *
- NEMA ICS 3.1
- CMAA Specifications #70
- IEC 146
- SEMIF47
- RINA
- CE (Frame 0-6)
EMC: EN61800-3
Low Voltage: EN50178
- ABS

* Apply to frames 7-10

Input Specifications

3-Phase Voltage: 200-240V ± 10%,
380-480V ± 10%,
500-690V + 10%/-5%
Frequency: 47 to 63 Hz
Logic Control Ride Through: 0.5 seconds

Output Specifications

Voltage: Adjustable from 0V
to rated motor voltage
Frequency Range: 0-420Hz
Instantaneous Over Current Trip: 220-300% based on drive rating

Enclosure and Ambient Operating Temperatures

Frame 0-6	
IP20/Open Type:	0° - 50° C (32° - 122° F)
IP20/UL Type 1:	0° - 40° C (32° - 104° F)
IP54/UL Type 12:	0° - 40° C (32° - 122° F)
Frame 7-10	
IP20/NEMA 1, IP00/NEMA Open:	0° - 40° C (32° - 104° F) (heatsink) 0° - 65° C (drive)