



PowerFlex 400 Adjustable Frequency AC Drives for Fan & Pump Applications

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Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

| Topic | Page |
|--|-------------|
| Updated template | throughout |
| Removed information for discontinued programming softwares support | throughout |
| Added Terminators to User Installed Options section | 11 |
| Added Spare parts information for Fan kits and Cover | 12 |
| Added Catalog No. 1203-USB to communication option kits table | 12 |
| Added Line Reactors data | 37 |
| Added DC Series Bus Inductors data | 38 |

Product Description

Providing users with easy installation in mechanical fan and pump systems, the Allen-Bradley® PowerFlex® 400 AC drive offers a wide range of built-in features allowing for seamless building system integration. Available in power ratings of 3.0...350 HP @ 480V AC and 3.0...50 HP @ 240V AC, the PowerFlex 400 is designed to meet global OEM, contractor and end-user demands for flexibility, space savings and ease-of-use. The PowerFlex 400 is a cost-effective solution for speed control in variable torque fan and pump applications.



Product Overview

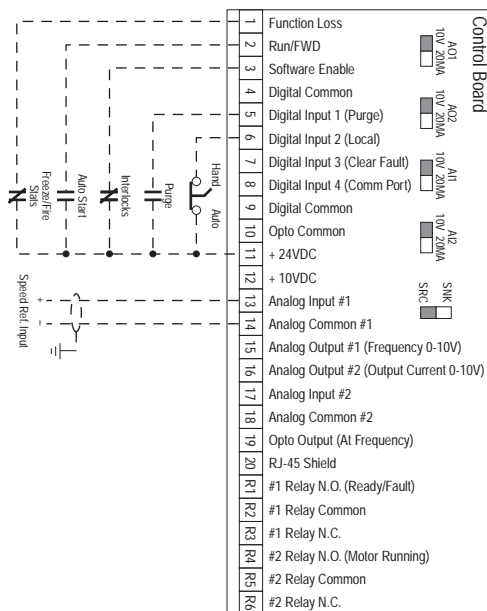
Packaging

- **IP20, NEMA/UL Type 1** - For conventional mounting inside or outside a control cabinet in a 45 °C (113 °F) ambient.
- **Flange Type** - Frame C ratings through 15 kW (20 HP) @ 380...480V AC and 7.5 kW (10 HP) @ 200...240V AC allow for mounting heatsink through back of an enclosure, thus removing a large portion of the heat inside a cabinet. The backside is rated IP66, NEMA/UL Type 4X/12 for both indoor and outdoor use.
- Installation flexibility is enhanced by the UL Plenum rating allowing for direct mounting in an air handling system.



I/O

- Three semi-programmable and four fully programmable digital inputs provide application versatility.
- Two programmable form C relay outputs and one opto output can be used to indicate various drive or motor conditions.
- Two analog outputs are DIP switch selectable for either voltage (0...10V) or current (0...20 mA). These scalable, 10-bit outputs are suitable for metering or as a speed reference for another drive.
- Two analog inputs (one unipolar and one bipolar) are DIP switch selectable for either voltage or current. One input is isolated from the rest of the drive I/O.
- Six programmable form A relay outputs are available via user installed Auxiliary Relay Board (Frames D through H only).



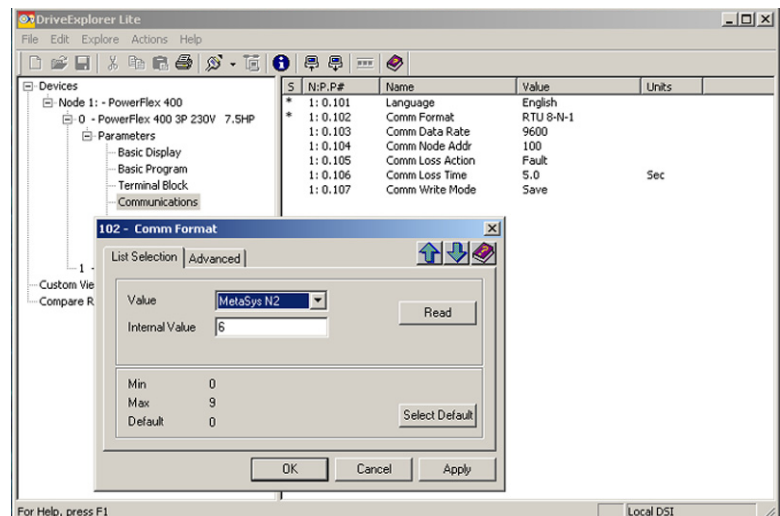
Operator Keypad and Programming

- Integral keypad features 2 line, 16 character LCD display.
- LED indicators provide system configuration and fault status.
- Configurable Hand/Off/Auto function buttons.
- Digital increase/decrease speed control.
- Parameter names are displayed as text.
- Parameters are grouped into files based on function, making programming fast and easy.



Communications

- Supports **Drive Serial Interface (DSI)** communication modules (**DeviceNet[®]**, **EtherNet/IP[™]**, **PROFIBUS DP**, **LonWorks**, **BACnet**) and accessories.
- Embedded **Modbus RTU**, **P1-FLN**, and **Metasys N2** protocols are parameter selectable and require no additional hardware or software.
- **Integral RS-485 communications** can be used for programming from a PC. It can also be used in a multi-drop network configuration. A serial converter module provides connectivity to any controller with a DF1 port.



PC Programming Software

Connected Components Workbench Software

Connected Components Workbench™ software is a windows-based software packages for programming and configuring Allen-Bradley drives and other Rockwell Automation products. See rok.auto/ccw.

Compatibility: Windows® XP, Windows Vista and Windows 7

- Online and offline programming capability.
- Operate the drive via an on-screen Control Bar, which is a tool that allows you to start, stop, and change the speed reference of the drive.
- Save, restore, and print parameter information.
- Edit, upload, and download parameters.
- Immediate visual indication of drive and communication status when viewing online drive.



Application Features

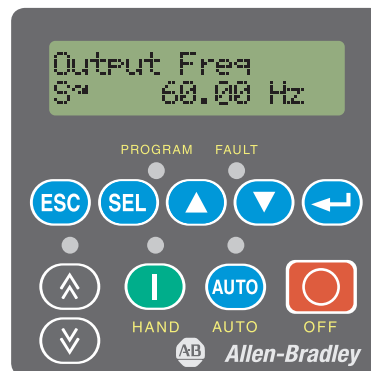
Configurable Keypad Hand-Off-Auto Functions

Parameter P042 [Auto Mode] defines the operating configuration of the control keys.

Hand-Off-Auto Configuration

Hand Mode: Start command and speed reference come from the integral keypad. Auto keyswitches control from Hand mode to Auto mode in a bumpless transfer as long as there is an active run command.

Auto Mode: Start command is defined by P036 [Start Source] (keypad, terminal block, comm port) and speed reference is defined by P038 [Speed Reference] (analog inputs, preset frequency, comm port). Start/Hand keyswitches control and speed reference to the integral keypad in a bumpless transfer.



Local/Remote Configuration

Local Mode: Start command and speed reference come from the integral keypad. Auto key stops the drive and the drive switches to Remote mode.

Remote Mode: Start command is defined by P036 [Start Source] and speed reference is defined by P038 [Speed Reference]. Auto key stops the drive and the drive switches to Local mode.

Auto/Manual Configuration

Manual Mode: Start command is defined by P036 [Start Source] and the speed reference comes from the integral keypad. Auto key toggles frequency control to Auto mode in a bumpless transfer.

Auto Mode: Start command is defined by P036 [Start Source] and speed reference is defined by P038 [Speed Reference]. Auto keyswitches frequency control to the integral keypad in a bumpless transfer.

Connectivity to Building Fire and Life Safety Systems

Purge

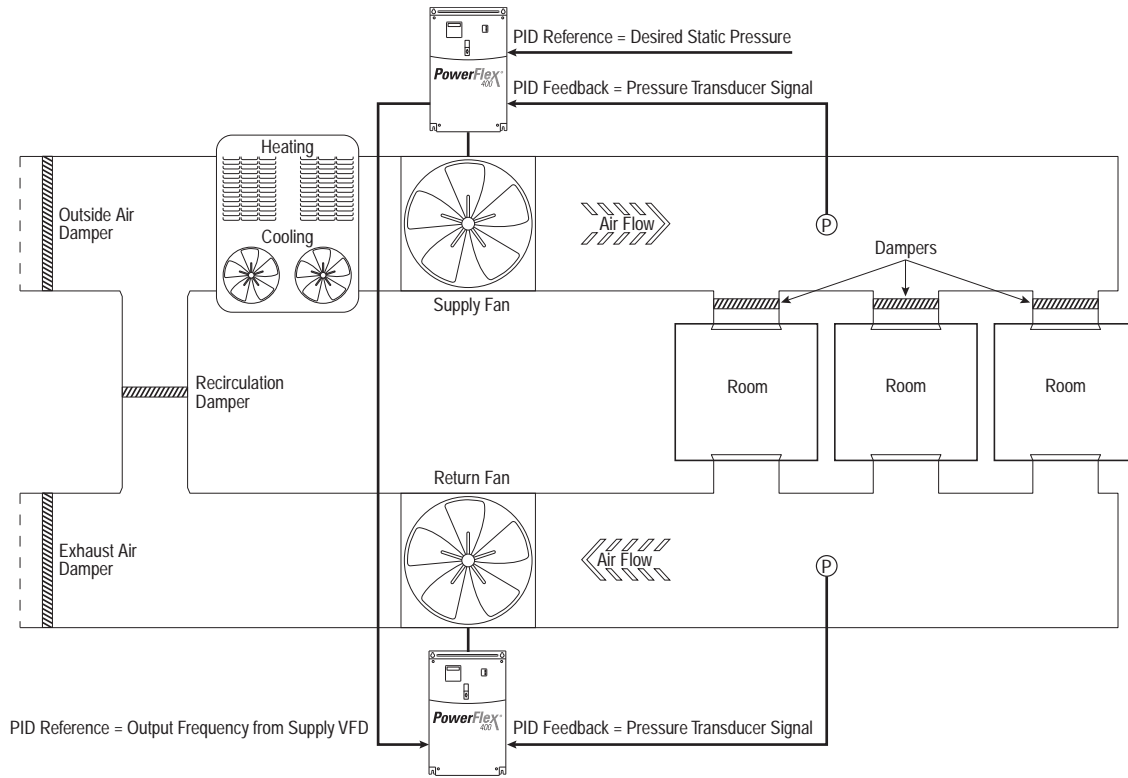
The PowerFlex 400 drive has an input which can be wired to a fire control panel or other fire/life safety systems allowing control of the drive to be overridden. A purge input starts the drive at a programmable purge speed regardless of the selected start source. Purge can occur and is operational at any time whether the drive is running or stopped. A purge command takes precedence over a stop command from the comm port/network and over a "SW Enable" command from the terminal block.

Fire/Freeze Status

The PowerFlex 400 drive can be tied into fire alarm systems or interlocked with cooling coils via a “Function Loss” input on the drive. Upon opening of the input, the drive will immediately coast to a stop if running and issue a fault. The drive will only be allowed to restart once the alarm state is cleared and the drive fault is reset.

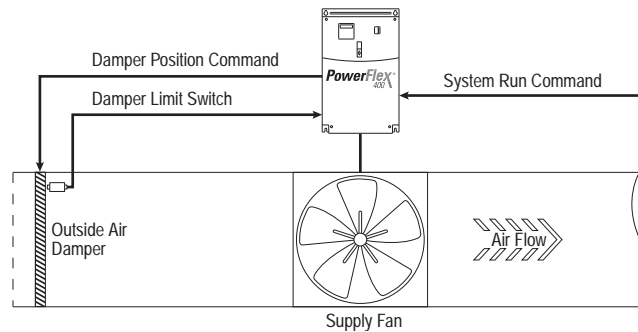
Proportional, Integral, Differential Control Loop

The PowerFlex 400 has a built-in PID (Proportional, Integral, Differential) control loop. The PID loop is used to maintain a process variable, such as pressure or flow, at a desired set point. The PID loop works by subtracting the PID feedback from a reference and generating an error value. The PID loop reacts to the error, based on the PID gains, and outputs a frequency to try to reduce the error value to zero.



Damper Control

The PowerFlex 400 allows damper control logic to be imbedded within the drive reducing cost that is associated with external control hardware and software. A system Run command can be wired directly into one of the drive inputs. Relay outputs can be used to energize the damper to either open or close. A damper limit switch can be wired back to the drive providing indication that the damper is in the proper position and that it is safe for the drive to run at commanded speed.

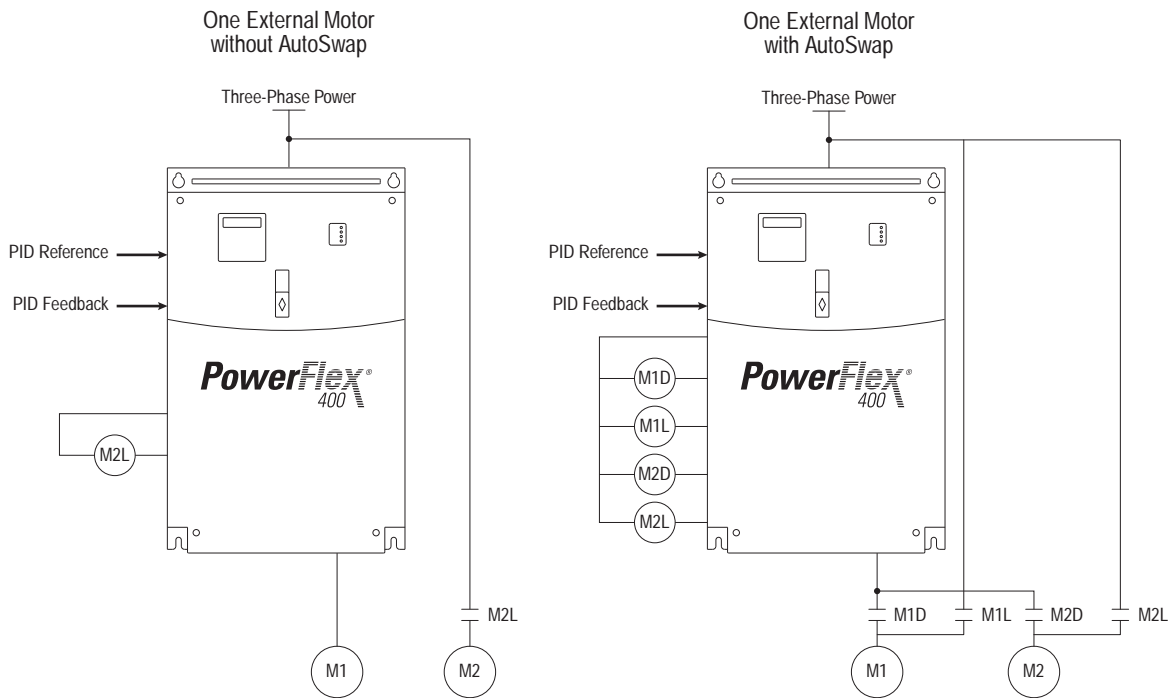


Product Selection Guide

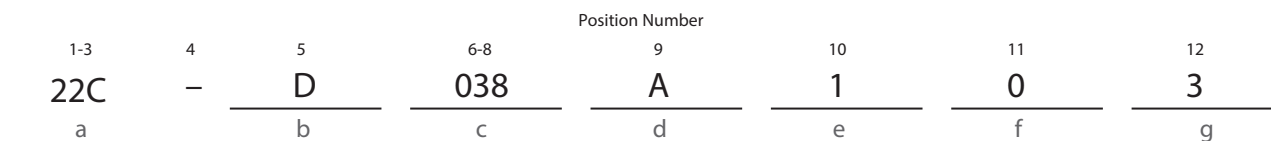
Auxiliary Motor Control

The PowerFlex 400 has a built-in Auxiliary Motor Control feature. This feature allows operation of up to three line-started motors and the motor controlled directly by the PowerFlex 400 drive. System output can vary from 0% (auxiliary motors off and drive-controlled motor at zero speed) to 400% (3 auxiliary motors and drive-controlled motor at full speed). When Auxiliary Motor Control is enabled, the internal PID controller in the PowerFlex 400 uses a reference and feedback signal to adjust the speed of the drive-controlled motor such that the feedback signal follows the reference signal. When demand exceeds the first motors capacity, the PowerFlex 400 Auxiliary Motor Control automatically starts an auxiliary motor. The speed of the drive-controlled motor is reduced to account for the auxiliary motors additional output to the system. If demand continues to increase, the PowerFlex Auxiliary Motor Control starts additional motors using the same process. When demand decreases, an auxiliary motor is stopped and the PowerFlex Auxiliary Motor Control increases the speed of the drive-controlled motor to account for lost system output. A Motor Interlock input identifies motors that are out of service and causes them to skip over to the next available motor.

An Auto Swap function also can be used which allows equal wear to be placed on each motor by periodically swapping the drive controlled and auxiliary motors. Each motor in the system will over time be connected to the PowerFlex 400 drive and also directly to the AC line. During an Auto Swap, the motor that is directly connected to the PowerFlex 400 drive is stopped and the contactor is opened. The contactor of the next motor that will be controlled by the PowerFlex 400 drive is opened if running across the AC line. A contactor is closed connecting this motor directly to the PowerFlex 400 drive and is started. An additional motor is line started if necessary.



Catalog Number Explanation



a

| Drive | |
|-------|---------------|
| Code | Type |
| 22C | PowerFlex 400 |

b

| Voltage Rating | | |
|----------------|---------|-----|
| Code | Voltage | Ph. |
| B | 240V AC | 3 |
| D | 480V AC | 3 |

c1

| Rating | | | |
|------------------|------|-----------|-------|
| 200...240V Input | | | |
| Code | Amps | kW (Hp) | Frame |
| 012 | 12 | 2.2 (3.0) | C |
| 017 | 17.5 | 3.7 (5.0) | C |
| 024 | 24 | 5.5 (7.5) | C |
| 033 | 33 | 7.5 (10) | C |
| 049 | 49 | 11 (15) | D |
| 065 | 65 | 15 (20) | D |
| 075 | 75 | 18.5 (25) | D |
| 090 | 90 | 22 (30) | D |
| 120 | 120 | 30 (40) | E |
| 145 | 145 | 37 (50) | E |

c2

| Rating | | | |
|------------------|------|-----------|-------|
| 380...480V Input | | | |
| Code | Amps | kW (Hp) | Frame |
| 6P0 | 6.0 | 2.2 (3.0) | C |
| 010 | 10.5 | 4.0 (5.0) | C |
| 012 | 12 | 5.5 (7.5) | C |
| 017 | 17 | 7.5 (10) | C |
| 022 | 22 | 11 (15) | C |
| 030 | 30 | 15 (20) | C |
| 038 | 38 | 18.5 (25) | D |
| 045 | 45.5 | 22 (30) | D |
| 060 | 60 | 30 (40) | D |
| 072 | 72 | 37 (50) | E |
| 088 | 88 | 45 (60) | E |
| 105 | 105 | 55 (75) | E |
| 142 | 142 | 75 (100) | E |
| 170 | 170 | 90 (125) | F |
| 208 | 208 | 110 (150) | F |
| 260 | 260 | 132 (200) | G |
| 310 | 310 | 160 (250) | G |
| 370 | 370 | 200 (300) | H |
| 460 | 460 | 250 (350) | H |

d

| Enclosure | |
|-----------|---|
| Code | Enclosure |
| N | Panel Mount - IP20, NEMA/UL Type Open ⁽¹⁾ |
| A | Panel Mount - IP30, NEMA/UL Type 1 ⁽²⁾ |
| F | Flange Mount - IP20, NEMA/UL Type Open ⁽³⁾ |

⁽¹⁾ Frame C drives only available with IP20, NEMA/UL Type Open enclosure. Field installed conversion kit available to achieve IP30, NEMA/UL Type 1 rating.

⁽²⁾ Frame D, E and F drives only available with IP30, NEMA/UL Type 1 enclosure.

⁽³⁾ Frame C drives only.

e

| HIM | |
|------|------------------|
| Code | Interface Module |
| 1 | Fixed Keypad |

f

| Emission Class | |
|----------------|--------------|
| Code | Rating |
| 0 | Not Filtered |

g

| Version | |
|---------|---------|
| Code | Version |
| 3 | RS485 |

PowerFlex 400 Standard Drives

200...240V AC, Three Phase Drives

| Drive Ratings | | | | Rating | Catalog No. | |
|---------------|-----|-------------------------------|------------|--|--------------|--------------|
| kW | HP | Output Current ⁽¹⁾ | Frame Size | | Panel Mount | Flange Mount |
| 2.2 | 3.0 | 12 A | C | IP20, NEMA/UL Open Type ⁽²⁾ | 22C-B012N103 | 22C-B012F103 |
| 3.7 | 5.0 | 17.5 A | C | IP20, NEMA/UL Open Type ⁽²⁾ | 22C-B017N103 | 22C-B017F103 |
| 5.5 | 7.5 | 24 A | C | IP20, NEMA/UL Open Type ⁽²⁾ | 22C-B024N103 | 22C-B024F103 |
| 7.5 | 10 | 33 A | C | IP20, NEMA/UL Open Type ⁽²⁾ | 22C-B033N103 | 22C-B033F103 |
| 11 | 15 | 49 A | D | IP30, NEMA/UL Type 1 | 22C-B049A103 | – |
| 15 | 20 | 65 A | D | IP30, NEMA/UL Type 1 | 22C-B065A103 | – |
| 18.5 | 25 | 75 A | D | IP30, NEMA/UL Type 1 | 22C-B075A103 | – |

200...240V AC, Three Phase Drives (Continued)

| Drive Ratings | | | | Rating | Catalog No. | |
|---------------|----|-------------------------------|------------|----------------------|--------------|--------------|
| kW | HP | Output Current ⁽¹⁾ | Frame Size | | Panel Mount | Flange Mount |
| 22 | 30 | 90 A | D | IP30, NEMA/UL Type 1 | 22C-B090A103 | - |
| 30 | 40 | 120 A | E | IP30, NEMA/UL Type 1 | 22C-B120A103 | - |
| 37 | 50 | 145 A | E | IP30, NEMA/UL Type 1 | 22C-B145A103 | - |

- (1) Drive terminals are sized according to UL. Depending on operating ambient and wire used, some local or national codes may require a larger wire size than what the power terminals can accept. Multiple conductors, 90°C wire, and/or lugs may be required. See the PowerFlex 400 user manual, publication [22C-UM001](#) for details on terminal block wire ranges.
- (2) IP30, NEMA/UL Type 1 can be achieved for panel mount drives with top cover and optional conduit box kit installed. Field installed conversion kit specified under [User Installed Options on page 11](#)

380...480V AC, Three Phase Drives

| Drive Ratings | | | | Rating | Catalog No. | |
|---------------|-----|-------------------------------|------------|--|--------------|-----------------------------|
| kW | HP | Output Current ⁽¹⁾ | Frame Size | | Panel Mount | Flange Mount |
| 2.2 | 3.0 | 6.0 A | C | IP20, NEMA/UL Open Type ⁽²⁾ | 22C-D6P0N103 | 22C-D6P0F103 |
| 4.0 | 5.0 | 10.5 A | C | IP20, NEMA/UL Open Type ⁽²⁾ | 22C-D010N103 | 22C-D010F103 |
| 5.5 | 7.5 | 12 A | C | IP20, NEMA/UL Open Type ⁽²⁾ | 22C-D012N103 | 22C-D012F103 |
| 7.5 | 10 | 17 A | C | IP20, NEMA/UL Open Type ⁽²⁾ | 22C-D017N103 | 22C-D017F103 |
| 11 | 15 | 22 A | C | IP20, NEMA/UL Open Type ⁽²⁾ | 22C-D022N103 | 22C-D022F103 ⁽³⁾ |
| 15 | 20 | 30 A | C | IP20, NEMA/UL Open Type ⁽²⁾ | 22C-D030N103 | 22C-D030F103 ⁽³⁾ |
| 18.5 | 25 | 38 A | D | IP30, NEMA/UL Type 1 | 22C-D038A103 | - |
| 22 | 30 | 45.5 A | D | IP30, NEMA/UL Type 1 | 22C-D045A103 | - |
| 30 | 40 | 60 A | D | IP30, NEMA/UL Type 1 | 22C-D060A103 | - |
| 37 | 50 | 72 A | E | IP30, NEMA/UL Type 1 | 22C-D072A103 | - |
| 45 | 60 | 88 A | E | IP30, NEMA/UL Type 1 | 22C-D088A103 | - |
| 55 | 75 | 105 A | E | IP30, NEMA/UL Type 1 | 22C-D105A103 | - |
| 75 | 100 | 142 A | E | IP30, NEMA/UL Type 1 | 22C-D142A103 | - |
| 90 | 125 | 170 A | F | IP30, NEMA/UL Type 1 | 22C-D170A103 | - |
| 110 | 150 | 208 A | F | IP30, NEMA/UL Type 1 | 22C-D208A103 | - |
| 132 | 200 | 260 A | G | IP30, NEMA/UL Type 1 | 22C-D260A103 | - |
| 160 | 250 | 310 A | G | IP30, NEMA/UL Type 1 | 22C-D310A103 | - |
| 200 | 300 | 370 A | H | IP30, NEMA/UL Type 1 | 22C-D370A103 | - |
| 250 | 350 | 460 A | H | IP30, NEMA/UL Type 1 | 22C-D460A103 | - |

- (1) Drive terminals are sized according to UL. Depending on operating ambient and wire used, some local or national codes may require a larger wire size than what the power terminals can accept. Multiple conductors, 90°C wire, and/or lugs may be required. See the PowerFlex 400 User Manual, publication [22C-UM001](#) for details on terminal block wire ranges.
- (2) IP30, NEMA/UL Type 1 can be achieved for panel mount drives with top cover and optional conduit box kit installed. Field installed conversion kit specified under [User Installed Options on page 11](#).
- (3) 11 and 15 kW (15 and 20 HP) Frame C flange mount drives require external DC series bus inductor.

User Installed Options

IP30, NEMA/UL Type 1 Conversion Kit

| Description | Drive Frame | Catalog No. |
|--|-------------|-------------|
| IP30, NEMA/UL Type 1 Kit <i>Description:</i> Field installed kit. Converts drive to IP30, NEMA/UL Type 1 enclosure. Includes conduit box with mounting screws and plastic top panel. | C | 22-JBAC |
| IP30, NEMA/UL Type 1 Kit with Communication Option <i>Description:</i> Field installed kit. Converts drive to IP30, NEMA/UL Type 1 enclosure. Includes communication option conduit box with mounting screws and plastic top panel. | C | 22-JBCC |

Human Interface Module Option Kits and Accessories

| Description | Catalog No. |
|--|--------------------------|
| Remote Human Interface Module (HIM) – Panel Mount <i>Description:</i> LCD Display, Remote Panel Mount, Digital Speed Control, Copycat capable, IP66, NEMA/UL Type 4X/12) indoor use only, Includes 2.0 meter cable. <i>Note:</i> Remote HIM display and keypad are different than PowerFlex 400 integral keypad. See the PowerFlex 400 user manual, publication 22C-UM001 for details. | 22-HIM-C2S |
| Remote Human Interface Module (HIM) – Handheld <i>Description:</i> LCD Display, Remote Handheld, Digital Speed Control, Full Numeric Keypad, Copycat capable, IP30, NEMA/UL Type 1), Includes 1.0 m cable, Panel Mount with optional Bezel Kit. <i>Note:</i> Remote HIM display and keypad are different than PowerFlex 400 integral keypad. See the PowerFlex 400 user manual, publication 22C-UM001 for details. | 22-HIM-A3 |
| Bezel Kit <i>Description:</i> Panel Mount for LCD Display, Remote Handheld unit, IP30, NEMA/UL Type 1). | 22-HIM-B1 |
| DSI HIM Cable <i>Description:</i> DSI HIM to RJ45 cable. 1.0 m (3.3 ft) 2.9 m (9.51 ft) | 22-HIM-H10 22-HIM-H30 |

PC Programming Software

| Item | Description | |
|--|--|--|
| Connected Components Workbench Software (Download via the Software Subscription Portal or DVD-ROM) rok.auto/ccw | Windows-based software packages for programming and configuring Allen-Bradley drives and other Rockwell Automation products. Compatibility: Windows XP, Windows Vista, and Windows 7. | See rok.auto/ccw for more information. |

Terminators

| Description ⁽¹⁾ | Catalog No. |
|---|-------------|
| For use with 3.7 kW (5 HP) and below drives | 1204-TFA1 |
| For use with 1.5 kW (2 HP) and above drives | 1204-TFB2 |

(1) For selection information, see Appendix A of the Wiring and Grounding Guidelines for Pulse Width Modulated (PWM) AC Drives, publication [DRIVES-IN001](#).

Spare Parts

| Item | Description | Catalog No. |
|----------------------|--|------------------------------|
| Fan Replacement Kits | Fan Replacement Kit - Frame C, 1 Fan | SK-U1-FAN1-C1 ⁽¹⁾ |
| | Fan Replacement Kit - Frame C, 1 Fan, 15 HP | SK-U1-FAN1-C2 ⁽²⁾ |
| | Fan Replacement Kit - Frame D, 2 Fans, B049...B090 & D038...D060 Ratings | SK-U1-FAN2-D1 |
| | Fan Replacement Kit - Frame E, 2 Fans, B120...B145 & D072...D142 Ratings | SK-U1-FAN2-E2 |
| | Fan Replacement Kit - Frame F, 2 Fans, IGBT, D170 & D208 Ratings | SK-U1-FAN2-F1 |
| | Fan Replacement Kit - Frame F, 1 Fan, Rectifier, D170 & D208 Ratings | SK-U1-FAN1-F2 |
| | Fan Replacement Kit - Frame F, 1 Fan, Choke, D170 & D208 Ratings | SK-U1-FAN1-F3 |
| | Fan Replacement Kit - Frame G, 1 Fan (Side), D260 & D310 Ratings | SK-U1-FAN1-G1 |
| | Fan Replacement Kit - Frame G, 4 Fans (Bottom), D260 & D310 Ratings | SK-U1-FAN4-G3 |
| | Fan Replacement Kit - Frame H, 1 Fan (Upper Side), D370 & D460 Ratings | SK-U1-FAN1-H1 |
| | Fan Replacement Kit - Frame H, 1 Fan (Middle Side), D370 & D460 Ratings | SK-U1-FAN1-H2 |
| | Fan Replacement Kit - Frame H, 4 Fans (Bottom), D370 & D460 Ratings | SK-U1-FAN4-H3 |
| Covers | Frame C Cover with Power Terminal Guard | SK-U1-CCVR1-C1 |
| | Frame D Cover | SK-U1-CCVR1-D1 |
| | Frame E Cover | SK-U1-CCVR1-E1 |
| | Frame F Cover | SK-U1-CCVR1-F1 |
| | Frame G Cover | SK-U1-CCVR1-G1 |
| | Frame H Cover | SK-U1-CCVR1-H1 |

(1) 3...10 HP at 200...240V AC and 3...10 HP at 380...480V AC.

(2) 15...20 HP at 380...480V AC.

Other Options

| Description | Catalog No. |
|--|-------------|
| Auxiliary Relay Board <i>Description:</i> Field installed kit. Expands drive output capabilities. | AK-U9-RLB1 |

Communication Option Kits

| Description | Catalog No. |
|--|------------------|
| Universal Serial Bus (USB) Converter includes 2m USB, 20-HIM-H10 and 22-HIM-H10 Cables. | 1203-USB |
| DSI Cable <i>Description:</i> 2.0 meter RJ45 to RJ45 cable, male to male connectors. | 22-RJ45CBL-C20 |
| Splitter Cable <i>Description:</i> RJ45 one to two port splitter cable. | AK-U0-RJ45-SC1 |
| Terminating Resistors <i>Description:</i> RJ45 120 Ohm resistors (2 pieces) | AK-U0-RJ45-TR1 |
| Terminal Block <i>Description:</i> RJ45 two position terminal block (5 pieces) | AK-U0-RJ45-TB2P |
| BACnet MS/TP RS-485 Communication Adapter <i>Note:</i> Requires a Communication Adapter Cover when used with Frame C PowerFlex 400 drives (Ordered Separately). | 22-COMM-B |
| ControlNet™ Communication Adapter <i>Note:</i> Requires a Communication Adapter Cover when used with Frame C PowerFlex 400 drives (Ordered Separately). | 22-COMM-C |
| DeviceNet Communication Adapter <i>Note:</i> Requires a Communication Adapter Cover when used with Frame C PowerFlex 400 drives (Ordered Separately). | 22-COMM-D |
| EtherNet/IP Communication Adapter <i>Note:</i> Requires a Communication Adapter Cover when used with Frame C PowerFlex 400 drives (Ordered Separately). | 22-COMM-E |
| LonWorks Communication Adapter <i>Note:</i> Requires a Communication Adapter Cover when used with Frame C PowerFlex 400 drives (Ordered Separately). | 22-COMM-L |
| PROFIBUS DP Communication Adapter <i>Note:</i> Requires a Communication Adapter Cover when used with Frame C PowerFlex 400 drives (Ordered Separately). | 22-COMM-P |
| External DSI Communications Kit <i>Description:</i> External mounting kit for 22-COMM communication options | 22-XCOMM-DC-BASE |

Communication Option Kits (Continued)

| Description | Catalog No. |
|---|------------------------|
| External Comms Power Supply <i>Description:</i> Optional 100...240V AC Power Supply for External DSI Communications Kit | 20-XCOMM-AC-PS1 |
| Communication Adapter Cover <i>Description:</i> Houses the Communication Adapter for Frame C drives. <i>Note:</i> This cover adds 25 mm (0.98 in.) to the overall depth of the drive and is only required for Frame C PowerFlex 400 drives. | 22C-CCC ⁽¹⁾ |
| Serial Flash Firmware Kit <i>Description:</i> Use a PC to update drive firmware. | AK-U9-FLSH1 |

(1) If IP30, NEMA/UL Type 1 is required, must also order 22-JBCC (Frame C drives only).

Installation Considerations

Input and Output Line Reactors (Loose)

208V, 60 Hz, Three-Phase

| PowerFlex 400 Ratings | | | Catalog No. | |
|-----------------------|-----|------|--------------------------|-----------------------|
| kW | HP | Amps | IPOO (NEMA/UL Type Open) | IPT1 (NEMA/UL Type 1) |
| 3% Impedance | | | | |
| 2.2 | 3.0 | 12 | 1321-3R12-A | 1321-3RA12-A |
| 3.7 | 5.0 | 18 | 1321-3R18-A | 1321-3RA18-A |
| 5.5 | 7.5 | 25 | 1321-3R25-A | 1321-3RA25-A |
| 7.5 | 10 | 35 | 1321-3R35-A | 1321-3RA35-A |
| 11 | 15 | 45 | 1321-3R45-A | 1321-3RA45-A |
| 15 | 20 | 55 | 1321-3R55-A | 1321-3RA55-A |
| 18.5 | 25 | 80 | 1321-3R80-A | 1321-3RA80-A |
| 22 | 30 | 80 | 1321-3R80-A | 1321-3RA80-A |
| 30 | 40 | 100 | 1321-3R100-A | 1321-3RA100-A |
| 37 | 50 | 130 | 1321-3R130-A | 1321-3RA130-A |
| 5% Impedance | | | | |
| 2.2 | 3.0 | 12 | 1321-3R12-B | 1321-3RA12-B |
| 3.7 | 5.0 | 18 | 1321-3R18-B | 1321-3RA18-B |
| 5.5 | 7.5 | 25 | 1321-3R25-B | 1321-3RA25-B |
| 7.5 | 10 | 35 | 1321-3R35-B | 1321-3RA35-B |
| 11 | 15 | 45 | 1321-3R45-B | 1321-3RA45-B |
| 15 | 20 | 55 | 1321-3R55-B | 1321-3RA55-B |
| 18.5 | 25 | 80 | 1321-3R80-B | 1321-3RA80-B |
| 22 | 30 | 80 | 1321-3R80-B | 1321-3RA80-B |
| 30 | 40 | 100 | 1321-3R100-B | 1321-3RA100-B |
| 37 | 50 | 130 | 1321-3R130-B | 1321-3RA130-B |

240V, 60 Hz, Three-Phase

| PowerFlex 400 Ratings | | | Catalog No. | |
|-----------------------|-----|------|--------------------------|-----------------------|
| kW | HP | Amps | IPOO (NEMA/UL Type Open) | IPT1 (NEMA/UL Type 1) |
| 3% Impedance | | | | |
| 2.2 | 3.0 | 12 | 1321-3R12-A | 1321-3RA12-A |
| 3.7 | 5.0 | 18 | 1321-3R18-A | 1321-3RA18-A |
| 5.5 | 7.5 | 25 | 1321-3R25-A | 1321-3RA25-A |
| 7.5 | 10 | 35 | 1321-3R35-A | 1321-3RA35-A |
| 11 | 15 | 45 | 1321-3R45-A | 1321-3RA45-A |
| 15 | 20 | 55 | 1321-3R55-A | 1321-3RA55-A |
| 18.5 | 25 | 80 | 1321-3R80-A | 1321-3RA80-A |
| 22 | 30 | 80 | 1321-3R80-A | 1321-3RA80-A |
| 30 | 40 | 100 | 1321-3R100-A | 1321-3RA100-A |
| 37 | 50 | 130 | 1321-3R130-A | 1321-3RA130-A |
| 5% Impedance | | | | |
| 2.2 | 3.0 | 12 | 1321-3R12-B | 1321-3RA12-B |
| 3.7 | 5.0 | 18 | 1321-3R18-B | 1321-3RA18-B |
| 5.5 | 7.5 | 25 | 1321-3R25-B | 1321-3RA25-B |
| 7.5 | 10 | 35 | 1321-3R35-B | 1321-3RA35-B |
| 11 | 15 | 45 | 1321-3R45-B | 1321-3RA45-B |
| 15 | 20 | 55 | 1321-3R55-B | 1321-3RA55-B |

240V, 60 Hz, Three-Phase (Continued)

| PowerFlex 400 Ratings | | | Catalog No. | |
|-----------------------|----|------|--------------------------|-----------------------|
| kW | HP | Amps | IPOO (NEMA/UL Type Open) | IP11 (NEMA/UL Type 1) |
| 18.5 | 25 | 80 | 1321-3R80-B | 1321-3RA80-B |
| 22 | 30 | 80 | 1321-3R80-B | 1321-3RA80-B |
| 30 | 40 | 100 | 1321-3R100-B | 1321-3RA100-B |
| 37 | 50 | 130 | 1321-3R130-B | 1321-3RA130-B |

480V, 60 Hz, Three-Phase

| PowerFlex 400 Ratings | | | Catalog No. | |
|-----------------------|-----|------|--------------------------|-----------------------|
| kW | HP | Amps | IPOO (NEMA/UL Type Open) | IP11 (NEMA/UL Type 1) |
| 3% Impedance | | | | |
| 2.2 | 3.0 | 8.0 | 1321-3R8-C | 1321-3RA8-C |
| 4.0 | 5.0 | 12 | 1321-3R12-B | 1321-3RA12-B |
| 5.5 | 7.5 | 12 | 1321-3R12-B | 1321-3RA12-B |
| 7.5 | 10 | 18 | 1321-3R18-B | 1321-3RA18-B |
| 11 | 15 | 25 | 1321-3R25-B | 1321-3RA25-B |
| 15 | 20 | 35 | 1321-3R35-B | 1321-3RA35-B |
| 18.5 | 25 | 35 | 1321-3R35-B | 1321-3RA35-B |
| 22 | 30 | 45 | 1321-3R45-B | 1321-3RA45-B |
| 30 | 40 | 55 | 1321-3R55-B | 1321-3RA55-B |
| 37 | 50 | 80 | 1321-3R80-B | 1321-3RA80-B |
| 45 | 60 | 80 | 1321-3R80-B | 1321-3RA80-B |
| 55 | 75 | 100 | 1321-3R100-B | 1321-3RA100-B |
| 75 | 100 | 130 | 1321-3R130-B | 1321-3RA130-B |
| 90 | 125 | 160 | 1321-3R160-B | 1321-3RA160-B |
| 110 | 150 | 200 | 1321-3R200-B | 1321-3RA200-B |
| 132 | 200 | 250 | 1321-3RB250-B | 1321-3RAB250-B |
| 160 | 250 | 320 | 1321-3RB320-B | 1321-3RAB320-B |
| 200 | 300 | 400 | 1321-3RB400-B | 1321-3RAB400-B |
| 250 | 350 | 500 | 1321-3R500-B | 1321-3RA500-B |
| 5% Impedance | | | | |
| 2.2 | 3.0 | 8.0 | 1321-3R8-D | 1321-3RA8-D |
| 4.0 | 5.0 | 12 | 1321-3R12-C | 1321-3RA12-B |
| 5.5 | 7.5 | 12 | 1321-3R12-C | 1321-3RA12-C |
| 7.5 | 10 | 18 | 1321-3R18-C | 1321-3RA18-C |
| 11 | 15 | 25 | 1321-3R25-C | 1321-3RA25-C |
| 15 | 20 | 35 | 1321-3R35-C | 1321-3RA35-C |
| 18.5 | 25 | 35 | 1321-3R35-C | 1321-3RA35-C |
| 22 | 30 | 45 | 1321-3R45-C | 1321-3RA45-C |
| 30 | 40 | 55 | 1321-3R55-C | 1321-3RA55-C |
| 37 | 50 | 80 | 1321-3R80-C | 1321-3RA80-C |
| 45 | 60 | 80 | 1321-3R80-C | 1321-3RA80-C |
| 55 | 75 | 100 | 1321-3R100-C | 1321-3RA100-C |
| 75 | 100 | 130 | 1321-3R130-C | 1321-3RA130-C |
| 90 | 125 | 160 | 1321-3R160-C | 1321-3RA160-C |
| 110 | 150 | 200 | 1321-3R200-C | 1321-3RA200-C |
| 132 | 200 | 250 | 1321-3RB250-C | 1321-3RAB250-C |
| 160 | 250 | 320 | 1321-3RB320-C | 1321-3RAB320-C |
| 200 | 300 | 400 | 1321-3RB400-C | 1321-3RAB400-C |
| 250 | 350 | 500 | 1321-3R500-C | 1321-3RA500-C |

DC Series Bus Inductors (Loose)

200...240V, 60 Hz, Three-Phase

| PowerFlex 400 Ratings | | | Inductance (mH) | Catalog No. |
|-----------------------|-----|------|-----------------|--------------------------|
| kW | HP | Amps | | IP00 (NEMA/UL Type Open) |
| 2.2 | 3.0 | 12 | 0.92 | 1321-DC12-1 |
| 3.7 | 5.0 | 17.5 | 0.63 | 1321-DC18-1 |
| 5.5 | 7.5 | 24 | 0.85 | 1321-DC32-1 |
| 7.5 | 10 | 33 | 0.75 | 1321-DC40-1 |

380...480V, 60 Hz, Three-Phase

| PowerFlex 400 Ratings | | | Inductance (mH) | Catalog No. |
|-----------------------|-----|------|-----------------|--------------------------|
| kW | HP | Amps | | IP00 (NEMA/UL Type Open) |
| 2.2 | 3.0 | 6.0 | 3.68 | 1321-DC9-2 |
| 4.0 | 5.0 | 10.5 | 2.1 | 1321-DC12-2 |
| 5.5 | 7.5 | 12 | 3.75 | 1321-DC18-4 |
| 7.5 | 10 | 17 | 1.75 | 1321-DC25-4 |
| 11 | 15 | 22 | 2.68 | 1321-DC32-2 |
| 15 | 20 | 30 | 2.00 | 1321-DC40-4 |

EMC Filters (Loose)

200...240V, 50/60 Hz, Three-Phase

| PowerFlex 400 Ratings | | | Catalog No. |
|-----------------------|-----|------|-------------|
| kW | HP | Amps | |
| 2.2 | 3.0 | 12 | 22-RF034-CS |
| 3.7 | 5.0 | 17.5 | 22-RF034-CS |
| 5.5 | 7.5 | 24 | 22-RF034-CS |
| 7.5 | 10 | 33 | 22-RF034-CS |
| 11 | 15 | 49 | 22-RFD070 |
| 15 | 20 | 65 | 22-RFD100 |
| 18.5 | 25 | 75 | 22-RFD100 |
| 22 | 30 | 90 | 22-RFD150 |
| 30 | 40 | 120 | 22-RFD150 |
| 37 | 50 | 145 | 22-RFD180 |

380...480V, 50/60 Hz, Three-Phase

| PowerFlex 400 Ratings | | | Catalog No. |
|-----------------------|-----|------|-------------|
| kW | HP | Amps | |
| 2.2 | 3.0 | 6.0 | 22-RF018-CS |
| 4.0 | 5.0 | 10.5 | 22-RF018-CS |
| 5.5 | 7.5 | 12 | 22-RF018-CS |
| 7.5 | 10 | 17 | 22-RF018-CS |
| 11 | 15 | 22 | 22-RF026-CS |
| 15 | 20 | 30 | 22-RFD036 |
| 18.5 | 25 | 38 | 22-RFD050 |
| 22 | 30 | 45.5 | 22-RFD050 |
| 30 | 40 | 60 | 22-RFD070 |
| 37 | 50 | 72 | 22-RFD100 |
| 45 | 60 | 88 | 22-RFD100 |
| 55 | 75 | 105 | 22-RFD150 |

380...480V, 50/60 Hz, Three-Phase (Continued)

| PowerFlex 400 Ratings | | | Catalog No. |
|-----------------------|-----|------|-------------|
| kW | HP | Amps | |
| 75 | 100 | 142 | 22-RFD180 |
| 90 | 125 | 170 | 22-RFD208 |
| 110 | 150 | 208 | 22-RFD208 |
| 132 | 200 | 260 | 22-RFD323 |
| 160 | 250 | 310 | 22-RFD480 |
| 200 | 300 | 370 | 22-RFD480 |
| 250 | 350 | 460 | 22-RFD480 |

Isolation Transformers (Loose)

208V AC, 3 Phase, 60 Hz Secondary

| PowerFlex 400 Ratings | | | IP32 (NEMA/UL Type 3R) Isolation Transformer | |
|-----------------------|-----|------|--|-------------------|
| kW | HP | Amps | kVA | Catalog No. |
| | | | | 208 Volts Primary |
| 2.2 | 3.0 | 12 | 5.0 | 1321-3TW005-XX |
| 4.0 | 5.0 | 17.5 | 7.5 | 1321-3TW007-XX |
| 5.5 | 7.5 | 24 | 11 | 1321-3TW011-XX |
| 7.5 | 10 | 33 | 14 | 1321-3TW014-XX |
| 11 | 15 | 49 | 20 | 1321-3TW020-XX |
| 15 | 20 | 65 | 27 | 1321-3TW027-XX |
| 18.5 | 25 | 75 | 34 | 1321-3TW034-XX |

230V AC, 3 Phase, 60 Hz Secondary

| PowerFlex 400 Ratings | | | IP32 (NEMA/UL Type 3R) Isolation Transformer | | | |
|-----------------------|-----|------|--|-------------------|-------------------|-------------------|
| kW | HP | Amps | kVA | Catalog No. | | |
| | | | | 230 Volts Primary | 460 Volts Primary | 575 Volts Primary |
| 2.2 | 3.0 | 12 | 5.0 | 1321-3TW005-AA | 1321-3TW005-BA | 1321-3TW005-CA |
| 3.7 | 5.0 | 17.5 | 7.5 | 1321-3TW007-AA | 1321-3TW007-BA | 1321-3TW007-CA |
| 5.5 | 7.5 | 24 | 11 | 1321-3TW011-AA | 1321-3TW011-BA | 1321-3TW011-CA |
| 7.5 | 10 | 33 | 14 | 1321-3TW014-AA | 1321-3TW014-BA | 1321-3TW014-CA |
| 11 | 15 | 49 | 20 | 1321-3TW020-AA | 1321-3TW020-BA | 1321-3TW020-CA |
| 15 | 20 | 65 | 27 | 1321-3TW027-AA | 1321-3TW027-BA | 1321-3TW027-CA |
| 18.5 | 25 | 75 | 34 | 1321-3TW034-AA | 1321-3TW034-BA | 1321-3TW034-CA |
| 22 | 30 | 90 | 40 | 1321-3TW040-AA | 1321-3TW040-BA | 1321-3TW040-CA |
| 30 | 40 | 120 | 51 | 1321-3TW051-AA | 1321-3TW051-BA | 1321-3TW051-CA |
| 37 | 50 | 145 | 63 | 1321-3TH063-AA | 1321-3TH063-BA | - |

460V AC, 3 Phase, 60 Hz Secondary

| PowerFlex 400 Drive Ratings | | | IP32 (NEMA/UL Type 3R) Isolation Transformer | | | |
|-----------------------------|-----|------|--|-------------------|-------------------|-------------------|
| kW | HP | Amps | kVA | Catalog No. | | |
| | | | | 230 Volts Primary | 460 Volts Primary | 575 Volts Primary |
| 2.2 | 3.0 | 6.0 | 5.0 | 1321-3TW005-AB | 1321-3TW005-BB | 1321-3TW005-CB |
| 4.0 | 5.0 | 8.7 | 7.5 | 1321-3TW007-AB | 1321-3TW007-BB | 1321-3TW007-CB |
| 5.5 | 7.5 | 12 | 11 | 1321-3TW011-AB | 1321-3TW011-BB | 1321-3TW011-CB |
| 7.5 | 10 | 17 | 14 | 1321-3TW014-AB | 1321-3TW014-BB | 1321-3TW014-CB |
| 11 | 15 | 22 | 20 | 1321-3TW020-AB | 1321-3TW020-BB | 1321-3TW020-CB |
| 15 | 20 | 30 | 27 | 1321-3TW027-AB | 1321-3TW027-BB | 1321-3TW027-CB |
| 18.5 | 25 | 38 | 34 | 1321-3TW034-AB | 1321-3TW034-BB | 1321-3TW034-CB |

460V AC, 3 Phase, 60 Hz Secondary (Continued)

| PowerFlex 400 Drive Ratings | | | IP32 (NEMA/UL Type 3R) Isolation Transformer | | | |
|-----------------------------|-----|------|--|-------------------|-------------------|-------------------|
| kW | HP | Amps | kVA | Catalog No. | | |
| | | | | 230 Volts Primary | 460 Volts Primary | 575 Volts Primary |
| 22 | 30 | 45.5 | 40 | 1321-3TW040-AB | 1321-3TW040-BB | 1321-3TW040-CB |
| 30 | 40 | 60 | 51 | 1321-3TW051-AB | 1321-3TW051-BB | 1321-3TW051-CB |
| 37 | 50 | 72 | 63 | 1321-3TH063-AB | 1321-3TH063-BB | - |
| 45 | 60 | 88 | 75 | 1321-3TH075-AB | 1321-3TH075-BB | - |
| 55 | 75 | 105 | 93 | 1321-3TH093-AB | 1321-3TH093-BB | - |
| 75 | 100 | 142 | 118 | 1321-3TH118-AB | 1321-3TH118-BB | - |
| 90 | 125 | 170 | 145 | 1321-3TH145-AB | 1321-3TH145-BB | - |
| 110 | 150 | 208 | 175 | 1321-3TH175-AB | 1321-3TH175-BB | - |
| 132 | 200 | 260 | 200 | 1321-3TH220-AB | 1321-3TH220-BB | - |
| 160 | 250 | 310 | 245 | 1321-3TH275-AB | 1321-3TH275-BB | - |
| 200 | 300 | 370 | 305 | 1321-3TH330-AB | 1321-3TH330-BB | - |
| 250 | 350 | 460 | 390 | 1321-3TH440-AB | 1321-3TH440-BB | - |

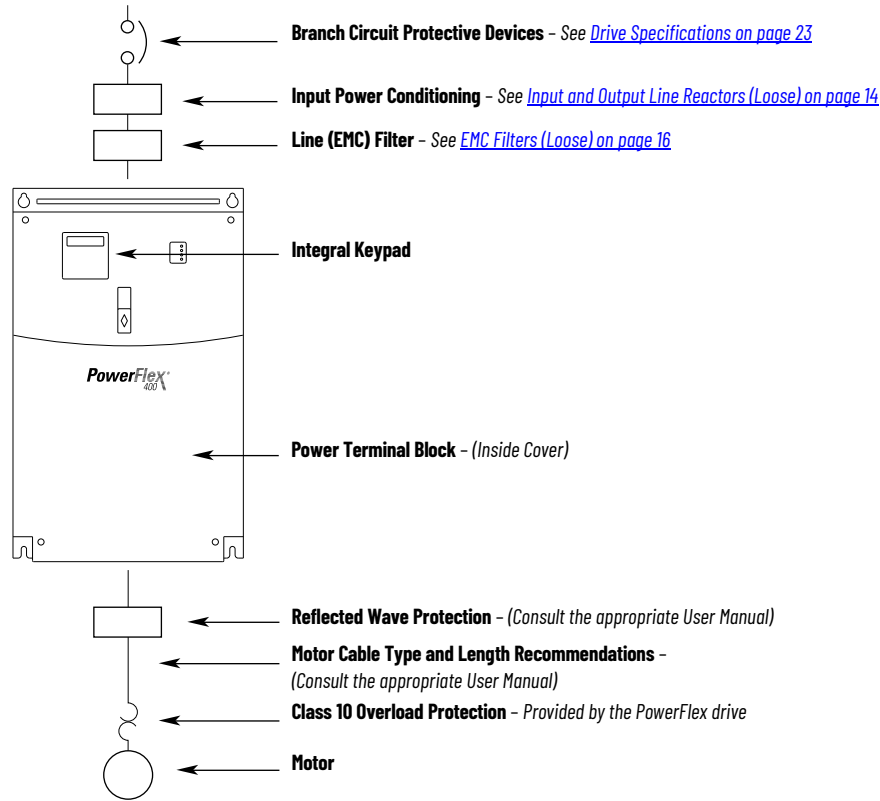
Power Wiring

PowerFlex 400 drives have the following built-in protective features to help simplify installation.

- Ground fault protection while starting and running ensures reliable operation
- Electronic motor overload protection increases motor life
- 6 kV transient protection provides increased robustness for 380...480V system voltages

There are many other factors that must be considered for optimal performance in any given application. The block diagram below highlights the primary installation considerations. See the PowerFlex 400 user manual, publication [22C-UM001](#), for detailed recommendations on input power conditioning, CE conformance (EMC filtering), FCC Compliance, reflected wave protection, motor cable types and motor cable distances.

Block Diagram

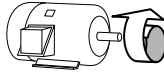




Power Terminal Block

Terminal Block Specifications

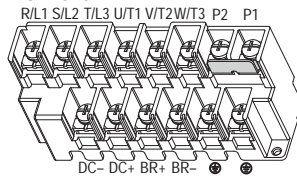
| Name | Frame | Description | Wire Size Range ⁽¹⁾ | | Recommended Torque | |
|----------------------|-------|---|---------------------------------|---------------------------------|--------------------------------|----------------------|
| | | | Maximum | Minimum | | |
| Power Terminal Block | C | All power terminals | 8.4 mm ² (8 AWG) | 1.3 mm ² (16 AWG) | 3.7 N•m (33 lb•in) | |
| | D | All power terminals | 33.6 mm ² (2 AWG) | 8.4 mm ² (8 AWG) | 5.1 N•m (45 lb•in) | |
| | E | 480V 37...45 kW (50...60 HP) | All power terminals | 33.6 mm ² (2 AWG) | 3.5 mm ² (12 AWG) | 5.6 N•m (49.5 lb•in) |
| | E | 240V 30...37 kW (40...50 HP) 480V 55...75 kW (75...100 HP) | All power terminals | 107.2 mm ² (4/0 AWG) | 53.5 mm ² (1/0 AWG) | 19.5 N•m (173 lb•in) |
| | F | All power terminals | 152.5 mm ² (300 MCM) | 85.0 mm ² (3/0 AWG) | 19.5 N•m (173 lb•in) | |
| | G | All power terminals | 152.5 mm ² (300 MCM) | 85.0 mm ² (3/0 AWG) | 29.4 N•m (260 lb•in) | |
| | H | All power terminals | 253.0 mm ² (500 MCM) | 127.0 mm ² (250 MCM) | 40.0 N•m (354 lb•in) | |
| I/O Terminal Block | All | Signal and control connections | 1.3 mm ² (16 AWG) | 0.13 mm ² (26 AWG) | 0.5...0.8 N•m (4.4...7 lb•in) | |

(1) Maximum/minimum sizes that the terminal block will accept - these are not recommendations. If national or local codes require sizes outside this range, lugs may be used.

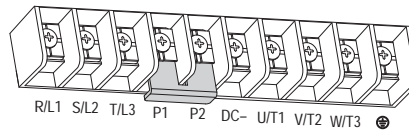
| Terminal ⁽¹⁾ | Description | | | |
|---|---|---|---|---|
| R/L1, S/L2, T/L3 | 3-Phase Input | | | |
| U/T1 | To Motor U/T1 | = |  | Switch any two motor leads to change forward direction. |
| V/T2 | To Motor V/T2 | | | |
| W/T3 | To Motor W/T3 | | | |
| P2, P1 | DC Bus Inductor Connection Drives are shipped with a jumper between Terminals P2 and P1. Remove this jumper only when a DC Bus Inductor will be connected. Drive will not power up without a jumper or inductor connected. | | |  |
| DC-, DC+ | DC Bus Connection (Frame C and H Drives) | | | |
| P2, DC- | DC Bus Connection (Frame D, E, F, and G Drives) | | | |
| BR+, BR- | Not Used | | | |
|  | Safety Ground - PE | | | |

⁽¹⁾ **Important:** Terminal screws may become loose during shipment. Ensure that all terminal screws are tightened to the recommended torque before applying power to the drive.

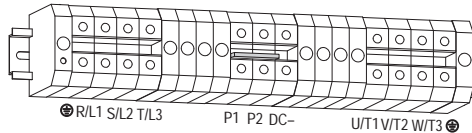
Frame C



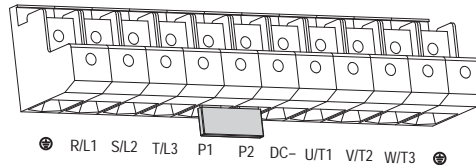
Frame D



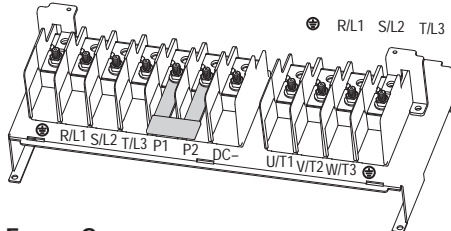
Frame E: 480V, 37-45kW (50-60HP)



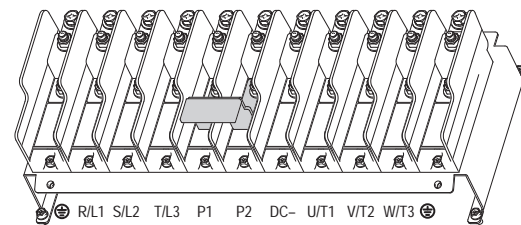
**Frame E: 240V, 30-37kW (40-50HP)
480V, 55-75kW (75-100HP)**



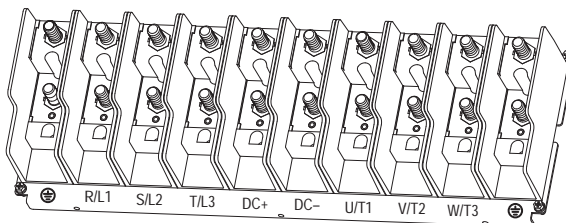
Frame F



Frame G

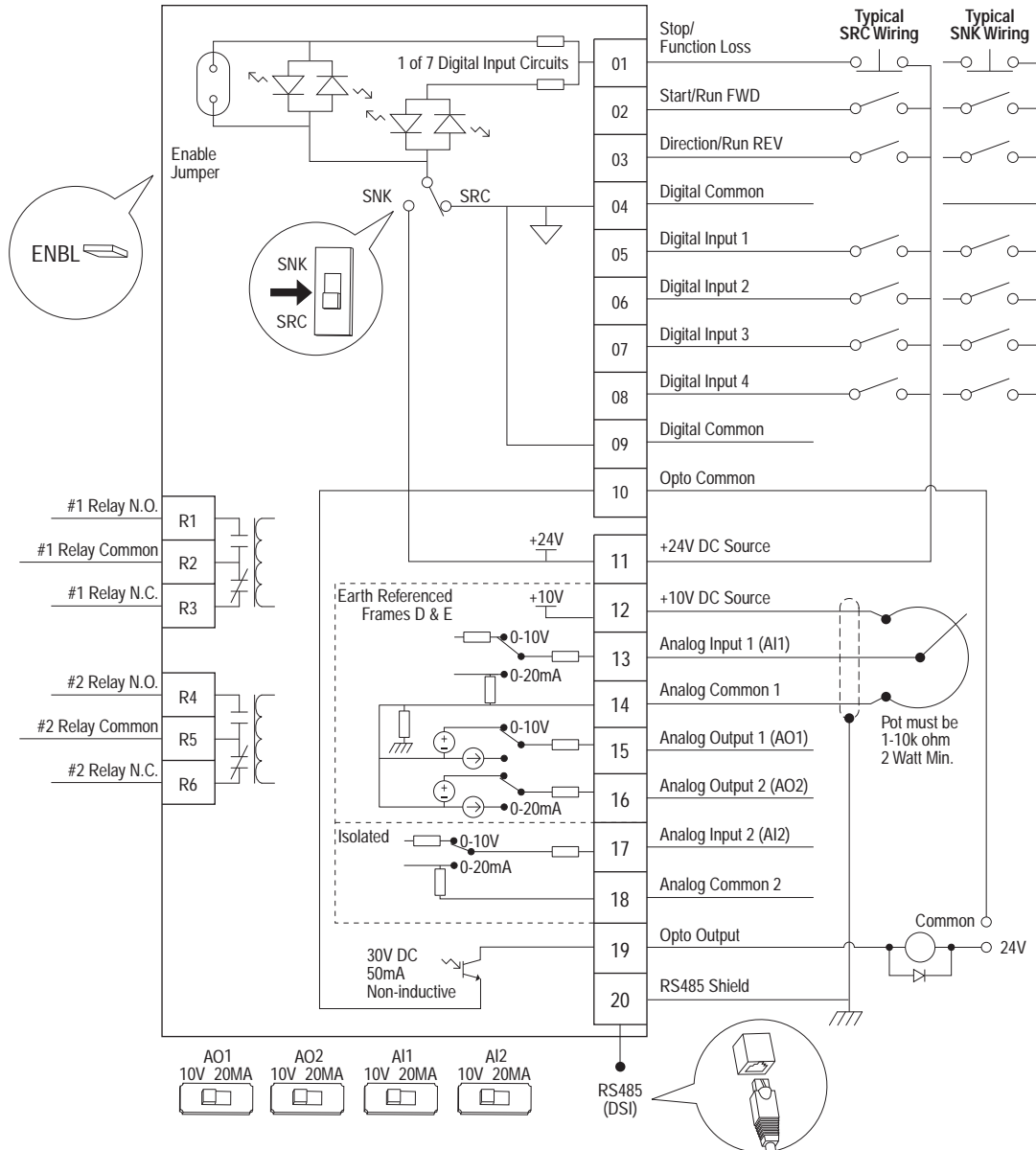


Frame H



Control Wiring

- The control logic is 24V DC and can be set for either Sink or Source control with a DIP switch setting.
- Control terminal screws are sized for a conventional blade screwdriver.
- I/O Terminals 1, 2 and 3 are semi-programmable and dedicated for Stop, Start, Reverse, and SW Enable inputs. These I/O Terminals can be programmed for 2-wire or 3-wire operation to meet application requirements.
- I/O Terminals 5, 6, 7 and 8 are fully programmable and provide added flexibility. Programmable functions include Local Control, Second Accel/Decel, Clear Fault, Preset Frequencies, RS-485 Control, Auxiliary Fault, and Purge.
- Speed can be controlled via (2) analog inputs. Both inputs can be configured for either voltage or current and can be used for applications such as PID. Voltage input can be programmed for bipolar operation.
- The drive is shipped with a jumper that is installed between I/O Terminals 01 and 11. This jumper can be removed when using I/O Terminal 01 as a Stop or Enable input.



Control I/O Terminal Designations

| No. | Signal | Default | Description | Parameter |
|-----|----------------------|----------------------|---|------------------------------|
| 01 | Stop / Function Loss | Coast | Factory-installed jumper or a normally closed input must be present for the drive to start. Program with P036 [Start Source]. | P036 |
| 02 | Start/Run FWD | - | HAND Mode: Command comes from Integral Keypad. AUTO Mode: I/O Terminal 02 is active. Program with P036 [Start Source]. | P036, P037 |
| 03 | Direction/Run REV | Rev Disabled | To enable reverse operation, program with A166 [Reverse Disable]. Program with P036 [Start Source]. | P036, P037, A166 |
| 04 | Digital Common | - | For digital inputs. Tied to I/O Terminal 09. Electronically isolated with digital inputs from analog I/O and opto output. | - |
| 05 | Digital Input 1 | Purge ⁽¹⁾ | Program with T051 [Digital In1 Sel]. | T051 |
| 06 | Digital Input 2 | Local | Program with T052 [Digital In2 Sel]. | T052 |
| 07 | Digital Input 3 | Clear Fault | Program with T053 [Digital In3 Sel]. | T053 |
| 08 | Digital Input 4 | Comm Port | Program with T054 [Digital In4 Sel]. | T054 |
| 09 | Digital Common | - | For digital inputs. Tied to I/O Terminal 04. Electronically isolated with digital inputs from analog I/O and opto output. | - |
| 10 | Opto Common | - | For opto-coupled outputs. Electronically isolated with opto output from analog I/O and digital inputs. | - |
| 11 | +24V DC | - | Drive supplied power for digital inputs. Referenced to Digital Common. Max Output: 100 mA. | |
| 12 | +10V DC | - | Drive supplied power for 0-10V external potentiometer. Referenced to Analog Common. Max Output: 15 mA. | P038 |
| 13 | Analog Input 1 | 0...10V | External 0...10V (unipolar), 0...20mA or 4...20mA input supply or potentiometer wiper. Default input is 0...10V. For current (mA) input, set A11 DIP switch to 20 mA. Program with T069 [Analog In 1 Sel]. Input Impedance: 100k ohm (Voltage Mode) 250 ohm (Current Mode) | T069, T070, T071, T072 |
| 14 | Analog Common 1 | - | Common for Analog Input 1 and Analog Output 1 and 2. Electrically isolated from digital I/O and opto output. | |
| 15 | Analog Output 1 | OutFreq 0...10 | Default analog output is 0-10V. For current (mA) value, set A01 DIP switch to 20 mA. Program with T082 [Analog Out1 Sel]. Max Load: 4...20mA = 525 ohm (10.5V) 0...10V = 1k ohm (10 mA) | P038, T051-T054, A152 |
| 16 | Analog Output 2 | OutCurr 0...10 | Default analog output is 0...10V. For a current (mA) value, set A02 DIP switch to 20 mA. Program with T085 [Analog Out2 Sel]. Max Load: 4...20mA = 525 ohm (10.5V) 0...10V = 1k ohm (10 mA) | T082, T084, T085, T086, T087 |
| 17 | Analog Input 2 | 0...10V | Optically isolated external 0...10V (unipolar), ±10V (bipolar), 0...20 mA or 4...20 mA input supply or potentiometer wiper. Default input is 0...10V. For current (mA) input, set A12 DIP switch to 20 mA. Program with T073 [Analog In 2 Sel]. Input Impedance: 100k ohm (Voltage Mode) 250 ohm (Current Mode) | T073, T074, T075, T076 |
| 18 | Analog Common 2 | - | For Analog Input 2. Electronically isolated from digital I/O and opto output. With Analog Input 2, provides one fully isolated analog input channel. | |
| 19 | Opto Output | At Frequency | Program with T065 [Opto Out Sel]. | T065, T066, T068 |
| 20 | RS-485 (DSI) Shield | - | Terminal connected to Safety Ground - PE when using the RS-485 (DSI) Communication Port. | |

(1) See the PowerFlex 400 user manual, publication [22C-UM001](#) for Important information regarding Stop commands and the [Digital Inx Sel] Purge option.

| No. | Signal | Default | Description | Parameter |
|--|-----------------|---------------|---|-----------|
| R1 | #1 Relay N.O. | Ready/Fault | Normally open contact for No. 1 output relay. | T055 |
| R2 | #1 Relay Common | - | Common for output relay. | |
| R3 | #1 Relay N.C. | Ready/Fault | Normally closed contact for No. 1 output relay. | T055 |
| R4 | #2 Relay N.O. | Motor Running | Normally open contact for No. 2 output relay. | T060 |
| R5 | #2 Relay Common | - | Common for output relay. | |
| R6 | #2 Relay N.C. | Motor Running | Normally closed contact for No. 2 output relay. | T060 |
| Selection DIP switches: Analog Input (A11 & A12) Analog Output (A01 & A02) | | 0...10V | Sets analog output to either voltage or current. Settings must match: A11 & T069 [Analog In 1 Sel] A12 & T073 [Analog In 2 Sel] A01 & T082 [Analog Out1 Sel] A02 & T085 [Analog Out2 Sel] | |
| Sink/source DIP switch | | Source (SRC) | Inputs can be wired as Sink (SNK) or Source (SRC) with DIP switch setting. | |

Specifications

User Installed Relay Board Terminal Designations

| No. | Signal | Default | Description | Parameter |
|-----|-----------------|-------------|---|-----------|
| 3A | #3 Relay N.O. | Ready/Fault | Normally open contact for Number 3 Output Relay | R221 |
| 3B | #3 Relay Common | - | Common for Number 3 Output Relay | |
| 4A | #4 Relay N.O. | Ready/Fault | Normally open contact for Number 4 Output Relay | R224 |
| 4B | #4 Relay Common | - | Common for Number 4 Output Relay | |
| 5A | #5 Relay N.O. | Ready/Fault | Normally open contact for Number 5 Output Relay | R227 |
| 5B | #5 Relay Common | - | Common for Number 5 Output Relay | |
| 6A | #6 Relay N.O. | Ready/Fault | Normally open contact for Number 6 Output Relay | R230 |
| 6B | #6 Relay Common | - | Common for Number 6 Output Relay | |
| 7A | #7 Relay N.O. | Ready/Fault | Normally open contact for Number 7 Output Relay | R233 |
| 7B | #7 Relay Common | - | Common for Number 7 Output Relay | |
| 8A | #8 Relay N.O. | Ready/Fault | Normally open contact for Number 8 Output Relay | R236 |
| 8B | #8 Relay Common | - | Common for Number 8 Output Relay | |

Drive Specifications

Drive Ratings




| Catalog No. | Output Ratings | | | Input Ratings | | | Branch Circuit Protection | | | | Power Dissipation |
|---|----------------|-------|-------|---------------|-------|------|---------------------------|--|------------|--|-------------------|
| | kW (HP) | Amps | | Voltage Range | kVA | Amps | Fuses | 140M Motor Protectors ^{(1) (2)} | Contactors | Min. Enclosure Volume ⁽³⁾ (in. ³) | IP20 Open Watts |
| | | 45 °C | 50 °C | | | | | | | | |
| 200...240V AC - 3-Phase Input, 0...230V 3-Phase Output | | | | | | | | | | | |
| 22C-B012N103 | 2.2 (3.0) | 12 | 12 | 180...265 | 6.5 | 15.5 | 20 | 140M-F8E-C16 | 100-C23 | 5098 | 146 |
| 22C-B017N103 | 3.7 (5.0) | 17.5 | 17.5 | 180...265 | 8.8 | 21 | 30 | 140M-F8E-C25 | 100-C37 | 5098 | 207 |
| 22C-B024N103 | 5.5 (7.5) | 24 | 24 | 180...265 | 10.9 | 26.1 | 35 | 140M-F8E-C32 | 100-C37 | 5098 | 266 |
| 22C-B033N103 | 7.5 (10) | 33 | 33 | 180...265 | 14.4 | 34.6 | 45 | 140M-F8E-C45 | 100-C45 | 5098 | 359 |
| 22C-B049A103 | 11 (15) | 49 | 49 | 180...265 | 21.3 | 51 | 70 | - | 100-C60 | - | 488 |
| 22C-B065A103 | 15 (20) | 65 | 65 | 180...265 | 28.3 | 68 | 90 | - | 100-C85 | - | 650 |
| 22C-B075A103 | 18.5 (25) | 75 | 75 | 180...265 | 32.5 | 78 | 100 | - | 100-D95 | - | 734 |
| 22C-B090A103 | 22 (30) | 90 | 81 | 180...265 | 38.3 | 92 | 125 | - | 100-D110 | - | 778 |
| 22C-B120A103 | 30 (40) | 120 | 120 | 180...265 | 51.6 | 124 | 175 | - | 100-D180 | - | 1055 |
| 22C-B145A103 | 37 (50) | 145 | 130 | 180...265 | 62.4 | 150 | 200 | - | 100-D180 | - | 1200 |
| 380...480V AC - 3-Phase Input, 0...460V 3-Phase Output | | | | | | | | | | | |
| 22C-D6P0N103 | 2.2 (3.0) | 6 | 6 | 340...528 | 6.3 | 7.5 | 10 | 140M-D8E-C10 | 100-C09 | 5098 | 105 |
| 22C-D010N103 | 4.0 (5.0) | 10.5 | 10.5 | 340...528 | 10.9 | 13 | 20 | 140M-D8E-C16 | 100-C16 | 5098 | 171 |
| 22C-D012N103 | 5.5 (7.5) | 12 | 12 | 340...528 | 11.9 | 14.2 | 20 | 140M-D8E-C16 | 100-C23 | 5098 | 200 |
| 22C-D017N103 | 7.5 (10) | 17 | 17 | 340...528 | 15.3 | 18.4 | 25 | 140M-D8E-C20 | 100-C23 | 5098 | 267 |
| 22C-D022N103 | 11 (15) | 22 | 22 | 340...528 | 19.2 | 23 | 30 | 140M-F8E-C32 | 100-C30 | 5098 | 329 |
| 22C-D030N103 | 15 (20) | 30 | 27 | 340...528 | 25.8 | 31 | 40 | 140M-F8E-C32 | 100-C37 | 5098 | 435 |
| 22C-D038A103 | 18.5 (25) | 38 | 38 | 340...528 | 33.3 | 40 | 50 | 140M-F8E-C45 | 100-C60 | 9086 | 606 |
| 22C-D045A103 | 22 (30) | 45.5 | 45.5 | 340...528 | 39.1 | 47 | 60 | - | 100-C60 | - | 738 |
| 22C-D060A103 | 30 (40) | 60 | 54 | 340...528 | 53.3 | 64 | 80 | - | 100-C85 | - | 764 |
| 22C-D072A103 | 37 (50) | 72 | 72 | 340...528 | 60.7 | 73 | 100 | - | 100-C85 | - | 1019 |
| 22C-D088A103 | 45 (60) | 88 | 88 | 340...528 | 74.9 | 90 | 125 | - | 100-D110 | - | 1245 |
| 22C-D105A103 | 55 (75) | 105 | 105 | 340...528 | 89 | 107 | 150 | - | 100-D140 | - | 1487 |
| 22C-D142A103 | 75 (100) | 142 | 128 | 340...528 | 124.8 | 150 | 200 | - | 100-D180 | - | 2043 |
| 22C-D170A103 | 90 (125) | 170 | 170 | 340...528 | 142 | 170 | 250 | - | 100-D250 | - | 2617 |

Drive Ratings (Continued)

| | | | | | | | | | | | |
|--------------|-----------|-----|-----|---------|-----|-----|-----|---|----------|---|------|
| 22C-D208A103 | 110 (150) | 208 | 208 | 340-528 | 167 | 200 | 250 | - | 100-D250 | - | 3601 |
| 22C-D260A103 | 132 (200) | 260 | 260 | 340-528 | 196 | 235 | 300 | - | 100-D300 | - | 3711 |
| 22C-D310A103 | 160 (250) | 310 | 290 | 340-528 | 242 | 290 | 400 | - | 100-D420 | - | 4208 |
| 22C-D370A103 | 200 (300) | 370 | 370 | 340-528 | 304 | 365 | 500 | - | 100-D420 | - | 4916 |
| 22C-D460A103 | 250 (350) | 460 | 410 | 340-528 | 387 | 465 | 600 | - | 100-D630 | - | 6167 |

- (1) The AIC ratings of the Bulletin 140M Motor Protector Circuit Breakers may vary. See the Use of Motor Protection Circuit Breakers with Variable-Frequency Drives Application Techniques, publication [140M-AT002](#).
- (2) 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, corner ground, or high-resistance ground systems.
- (3) When using a Manual Self-Protected (Type E) Combination Motor Controller, the drive must be installed in a ventilated or non-ventilated enclosure with the minimum volume specified in this column. Application specific thermal considerations may require a larger enclosure.

Certifications

| Category | Specification | |
|-----------------------------|---|--|
| Agency Certification |  | Listed to UL508C and CAN/CSA-22.2 Listed to UL508C for plenums |
| |  | Radiocommunications Act:1992 (including Amendments up to 2018) Radiocommunications (Electromagnetic Compatibility) Standard 2017 Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2017 |
| |  | Marked for all applicable European Directives EMC Directive (2014/30/EU) EN 61800-3 LVD Directive (2014/35/EU) EN 61800-5-1 |
| | The drive is also designed to meet the appropriate portions of the following specifications: NFPA 70 - US National Electrical Code NEMA ICS 3.1 - Safety standards for Construction and Guide for Selection, Installation, and Operation of Adjustable Speed Drive Systems. IEC 146 - International Electrical Code. | |
| Protection | Bus Overvoltage Trip: | 200...240V AC Input: 405V DC bus voltage (equivalent to 290V AC incoming line) 380...460V AC Input: 810V DC bus voltage (equivalent to 575V AC incoming line) |
| | Bus Undervoltage Trip: | 200...240V AC Input: 210V DC bus voltage (equivalent to 150V AC incoming line) 380...480V AC Input: 390V DC bus voltage (equivalent to 275V AC incoming line) |
| | Power Ride-Thru: | 100 ms |
| | Logic Control Ride-Thru: | 0.5 s min, 2 s typical |
| | Electronic Motor Overload Protection: | Provides class 10 motor overload protection according to NEC article 430 and motor over-temperature protection according to NEC article 430.126 (A) (2). UL 508C File 29572. |
| | Overcurrent: | 200% hardware limit, 300% instantaneous fault |
| | Ground Fault Trip: | Phase-to-ground on drive output |
| | Short Circuit Trip: | Phase-to-phase on drive output |
| Environment | Altitude: | 1000 m (3300 ft) max without derating. Above 1000 m (3300 ft) derate 3% for every 305 m (1000 ft). |
| | Max Surrounding Air Temperature without derating: IP20, NEMA/UL Type Open: IP30, NEMA/UL Type 1: | -10...+50 °C (14...122 °F) -10...+45 °C (14...113 °F) |
| | Cooling Method: | Fan: All drive ratings |
| | Storage Temperature: | -40...+85 °C (-40...+185 °F) |
| | 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. |
| | Relative Humidity: | 0...95% noncondensing |
| | Shock (operating): | 15G peak for 11 ms duration (±1.0 ms) |
| | Vibration (operating): | 1G peak, 5...2000 Hz |
| | Seismic Rating | Meets the seismic requirements of the 2003 International Building Code as specified by AC156. |

Certifications (Continued)

| Category | Specification | | |
|--|---|--|--|
| Electrical | Voltage Tolerance: | 200...240V ±10% 380...480V ±10% | |
| | Frequency Tolerance: | 48...63 Hz | |
| | Input Phases: | Three-phase input provides full rating. Single-phase operation provides 35% rated current. | |
| | Displacement Power Factor: | 0.98 across entire speed range | |
| | Efficiency: | 97.5% at rated amps, nominal line voltage | |
| | Transistor Type: | Isolated Gate Bipolar (IGBT) | |
| | Internal DC Bus Choke: 200-240V AC Input: 380-480V AC Input: | 11...37 kW (15...50 HP) Panel Mount Drives 18.5...160 kW (25...150 HP) Panel Mount Drives | |
| Internal AC Line Reactor 380-480V AC Input: | 200...250 kW (300...350 HP) Panel Mount Drives | | |
| Control | Method: | Sinusoidal PWM, Volts/Hertz | |
| | Carrier Frequency Frames C and D: Frames E and F: | 2...10 kHz, Drive rating based on 4 kHz 2...8 kHz, Drive rating based on 4 kHz | |
| | Frequency Accuracy Digital Input: Analog Input: Analog Output: | Within ±0.05% of set output frequency Within 0.5% of max output frequency, 10-Bit resolution ±2% of full scale, 10-Bit resolution | |
| | Speed Regulation - Open Loop with Slip Compensation: | ±1% of base speed across a 60:1 speed range | |
| | Output Frequency: | 0...320 Hz (programmable) | |
| | Stop Modes: | Multiple programmable stop modes including - Ramp, Coast, DC-Brake, Ramp-to-Hold and S-curve. | |
| | Accel/Decel: | Two independently programmable accel and decel times. Each time may be programmed from 0...600 s in 0.1 s increments. | |
| | Drive Overload: | 110% Overload capability for up to 1 min | |
| | Electronic Motor Overload Protection | Provides class 10 motor overload protection according to NEC article 430 and motor over-temperature protection according to NEC article 430.126 (A) (2). UL 508C File 29572. | |
| | Control Inputs | Digital: | Quantity: |
| Type Source Mode (SRC): Sink Mode (SNK): | | | 18...24V = ON, 0...6V = OFF 0...6V = ON, 18...24V = OFF |
| Analog: | | Quantity: | (1) Isolated, -10...10V or 4...20 mA (1) Non-isolated, 0...10V or 4...20 mA |
| | | Specification Resolution: 0...10V DC Analog: 4...20mA Analog: External Pot: | 10-bit 100k ohm input impedance 250 ohm input impedance 1...10k ohm, 2 W min |
| Control Outputs | Relay: | Quantity: | (2) Programmable Form C (6) Optional Programmable Form A (Drive Frames D through H Only) |
| | | Specification Resistive Rating: Inductive Rating: | 3.0 A @ 30V DC, 3.0 A @ 125V, 3.0 A @ 240V AC 0.5 A @ 30V DC, 0.5 A @ 125V, 0.5 A @ 240V AC |
| | Opto: | Quantity: | (1) Programmable |
| | | Specification: | 30V DC, 50 mA Non-inductive |
| | Analog: | Quantity: Specification Resolution: 0...10V DC Analog: 4...20mA Analog: | (2) Non-Isolated, 0...10V, or 4...20 mA 10-bit 1k ohm min 525 ohm max |
| Keypad | Display: | Integral 2 line by 16 character LCD with (5) LED Indicators | |
| | Languages: | English, Français, Español, Italiano, Deutsch, Português, Nederlands | |

Certifications (Continued)

| Category | Specification | |
|---------------|---------------------------------|--|
| Communication | Type: | Serial (RS-485) |
| | Supported Protocols (Standard): | Drive Serial Interface (DSI) Modbus RTU Metasys N2 P1-Floor Level Network (FLN) |
| | Supported Protocols (Optional): | BACnet DeviceNet EtherNet/IP PROFIBUS DP ControlNet LonWorks |
| | Software (Optional): | Windows Based Pocket PC/Windows Mobile 2003 |

Parameter List

| Parameter Number | Parameter Name | Description | Factory Default |
|----------------------------|-------------------|--|--|
| Basic Display Group | | | |
| b001 | Output Freq | Output frequency present at T1, T2 & T3 (U, V & W) | Read-only |
| b002 | Commanded Freq | Value of the active frequency command | Read-only |
| b003 | Output Current | Output current present at T1, T2 & T3 (U, V & W) | Read-only |
| b004 | Output Voltage | Output voltage present at T1, T2 & T3 (U, V & W) | Read-only |
| b005 | DC Bus Voltage | Present DC bus voltage level | Read-only |
| b006 | Drive Status | Present operating condition of the drive | Read-only |
| b007 | Fault 1 Code | A code that represents a drive fault | Read-only |
| b008 | Process Display | The output frequency scaled by parameter A160 [Process Factor] | Read-only |
| b010 | Output Power | Output power present at T1, T2 & T3 (U, V & W) | Read-only |
| b011 | Elapsed MWh | Accumulated output energy of the drive | Read-only |
| b012 | Elapsed Run Time | Accumulated time that the drive has output power since the last A195 [Reset Meters] | Read-only |
| b013 | Torque Current | Displays the torque portion of the output current | Read-only |
| b014 | Drive Temp | Present operating temperature of the drive power section | Read-only |
| b015 | Elapsed kWh | 0.0...100.0 kWh | Read-only |
| Basic Program Group | | | |
| P031 | Motor NP Volts | 20...drive rated volts | Based on Drive Rating |
| P032 | Motor NP Hertz | 15...320 Hz | 60 Hz |
| P033 | Motor OL Current | 0.0 Amps to (Drive Rated Amps x 2) in units of 0.1 Amps | Drive Rated Amps |
| P034 | Minimum Freq | 0.0...320.0 Hz | 0.0 Hz |
| P035 | Maximum Freq | 0.0...320.0 Hz | 60 Hz |
| P036 | Start Source | 7 settings; Keypad, 3-Wire, 2-Wire, 2-Wire Level Sensitive, 2-Wire High Speed, Comm Port, 2-Wire Level Sensitive with Enable | 2-Wire Level Sensitive |
| P037 | Stop Mode | 8 settings; Ramp Clear Fault, Coast Clear Fault, DC Brake Clear Fault, DC Brake w/Shutoff Clear Fault, Ramp, Coast, DC Brake, DC Brake w/Shutoff | Coast, CF (Clear Fault) |
| P038 | Speed Reference | 6 settings; Drive Keypad, Internal Freq, Analog Input 1, Analog Input 2, Preset Freq, Communications Port | Analog In1 |
| P039 | Accel Time 1 | 0.00...600.00 seconds | 20.00 Secs (0.3...150 HP) 60.00 Secs (200...350 HP) |
| P040 | Decel Time 1 | 0.00...600.00 seconds | 20.00 Secs (0.3...150 HP) 60.00 Secs (200...350 HP) |
| P041 | Reset To Defaults | Used to reset drive to factory default settings | Ready/Idle |
| P042 | Auto Mode | 4 settings; No Function, Hand-Off-Auto, Local/Remote, Auto/Manual | Hnd-Off-Auto |
| P043 | Motor OL Ret | 2 settings; Disabled, Enabled | Disabled |

Parameter List (Continued)

| Parameter Number | Parameter Name | Description | Factory Default |
|-----------------------------|------------------|--|-----------------------------------|
| Terminal Block Group | | | |
| T051 | Digital In1 Sel | 29 settings; Not Used, Purge, Auto Mode, Local, Comm Port, PID Disable, PID Hold, PID Reset, Preset Freq, Aux Fault, Clear Fault, RampStop Clear Fault, CoastStop Clear Fault, DCInjStop Clear Fault, Anlg1 InCtrl, Anlg2 InCtrl, MOP Up, MOP Down, Acc & Dec 2, Current Lmt2, Force DC, Mtr I-Lock 1, Mtr I-Lock 2, Mtr I-Lock 3, Mtr I-Lock 4, Cmd Reverse, Logic In 1, Logic In 2, Damper Input | Purge |
| T052 | Digital In2 Sel | | Local |
| T053 | Digital In3 Sel | | Clear Fault |
| T054 | Digital In4 Sel | | Comm Port |
| T055 | Relay Out1 Sel | 20 settings; Ready/Fault, At Frequency, MotorRunning, Hand Active, Motor Overld, Ramp Reg, Above Freq, Above Cur, Above DCVolt, Above Anlg 2, Above PF Ang, Anlg In Loss, ParamControl, Retries Exst, NonRec Fault, Reverse, Logic In 1, Logic In 2, Aux Motor, Fault | Ready/Fault |
| T056 | Relay Out1 Level | 0.0...9999 | 0.0 |
| T058 | Relay 1 On Time | 0.0...600.0 s | 0.0 s |
| T059 | Relay 1 Off Time | 0.0...600.0 s | 0.0 s |
| T060 | Relay Out2 Sel | 20 settings; Ready/Fault, At Frequency, MotorRunning, Hand Active, Motor Overld, Ramp Reg, Above Freq, Above Cur, Above DCVolt, Above Anlg 2, Above PF Ang, Anlg In Loss, ParamControl, Retries Exst, NonRec Fault, Reverse, Logic In 1, Logic In 2, Aux Motor, Fault | MotorRunning |
| T061 | Relay Out2 Level | 0.0...9999 | 0.0 |
| T063 | Relay 2 On Time | 0.0...600.0 s | 0.0 s |
| T064 | Relay 2 Off Time | 0.0...600.0 s | 0.0 s |
| T065 | Opto Out Sel | 19 settings; Ready/Fault, At Frequency, MotorRunning, Hand Active, Motor Overld, Ramp Reg, Above Freq, Above Cur, Above DCVolt, Above Anlg 2, Above PF Ang, Anlg In Loss, ParamControl, Retries Exst, NonRec Fault, Reverse, Logic In 1, Logic In 2, Fault | At Frequency |
| T066 | Opto Out Level | 0.0...9999 | 0.0 |
| T068 | Opto Out Logic | 2 settings; NO (Normally Open), NC (Normally Closed) | NO (Normally Open) |
| T069 | Analog In 1 Sel | 6 settings; Current Mode (0...20 mA), Current Mode (4...20 mA), Voltage Mode - Unipolar (0...10V), Current Mode Square Root (0...20 mA), Current Mode Square Root (4...20 mA), Voltage Mode Square Root - Unipolar (0...10V) | Voltage Mode - Unipolar (0...10V) |
| T070 | Analog In 1 Lo | 0.0...100.0% | 0.0% |
| T071 | Analog In 1 Hi | 0.0...100.0% | 100.0% |
| T072 | Analog In 1 Loss | 7 settings; Disabled, Fault, Stop, Zero Ref, Min Freq Ref, Max Freq Ref, Preset Freq0 | Disabled |
| T073 | Analog In 2 Sel | 8 settings; Current Mode (0...20 mA), Current Mode (4...20 mA), Voltage Mode - Unipolar (0...10V), Voltage Mode - Bipolar (-10...+10V), Current Mode Square Root (0...20 mA), Current Mode Square Root (4...20 mA), Voltage Mode Square Root - Unipolar (0...10V), Voltage Mode Square Root - Bipolar (-10...+10V) | Voltage Mode - Unipolar (0...10V) |
| T074 | Analog In 2 Lo | 0.0...100.0% | 0.0% |
| T075 | Analog In 2 Hi | 0.0...100.0% | 100.0% |
| T076 | Analog In 2 Loss | 7 settings; Disabled, Fault, Stop, Zero Ref, Min Freq Ref, Max Freq Ref, Preset Freq0 | Disabled |
| T077 | Sleep-Wake Sel | 5 settings; Disabled, Analog In 1, Analog In 2, Commanded Freq, Ind Slp Wake | Disabled |
| T078 | Sleep Level | 0.0...100.0% | 10.0% |
| T079 | Sleep Time | 0.0...600.0 s | 0.0 s |
| T080 | Wake Level | 0.0...100.0% | 15.0% |
| T081 | Wake Time | 0.0...600.0 s | 0.0 s |
| T082 | Analog Out1 Sel | 30 settings; OutFreq 0...10, OutCurr 0...10, OutTorq 0...10, OutVolt 0...10, OutPowr 0...10, Setpnt 0...10, TstData 0...10, OutFreq 0...20, OutCurr 0...20, OutTorq 0...20, OutVolt 0...20, OutPowr 0...20, Setpnt 0...20, TstData 0...20, OutFreq 4...20, OutCurr 4...20, OutTorq 4...20, OutVolt 4...20, OutPowr 4...20, Setpnt 4...20, TstData 4...20, MinFreq 0...10, MinFreq 0...20, MinFreq 4...20, AnlgIn1 0...10, AnlgIn1 0...20, AnlgIn1 4...20, AnlgIn2 0...10, AnlgIn2 0...20, AnlgIn2 4...20 | OutFreq 0...10 |
| T083 | Analog Out1 High | 0.0...800% | 100% |
| T084 | Anlg Out1 Setpt | 0.0...100.0% | 0.0% |
| T085 | Analog Out2 Sel | 30 settings; OutFreq 0...10, OutCurr 0...10, OutTorq 0...10, OutVolt 0...10, OutPowr 0...10, Setpnt 0...10, TstData 0...10, OutFreq 0...20, OutCurr 0...20, OutTorq 0...20, OutVolt 0...20, OutPowr 0...20, Setpnt 0...20, TstData 0...20, OutFreq 4...20, OutCurr 4...20, OutTorq 4...20, OutVolt 4...20, OutPowr 4...20, Setpnt 4...20, TstData 4...20, MinFreq 0...10, MinFreq 0...20, MinFreq 4...20, AnlgIn1 0...10, AnlgIn1 0...20, AnlgIn1 4...20, AnlgIn2 0...10, AnlgIn2 0...20, AnlgIn2 4...20 | OutCurr 0...10 |
| T086 | Analog Out2 High | 0.0...800% | 100% |
| T087 | Anlg Out2 Setpt | 0.0...100.0% | 0.0% |
| T088 | Anlg Loss Delay | 0.0...20.0 Secs | 0.0 s |
| T089 | Analog In Filter | 0...14 | 0 |

Parameter List (Continued)

| Parameter Number | Parameter Name | Description | Factory Default |
|-------------------------------|------------------|---|------------------------|
| T090 | Sleep Sel | 8 settings; AI1 > SlpLvl, AI1 < SlpLvl, AI2 > SlpLvl, AI2 < SlpLvl, OFrq>SlpLvl, OFrq<SlpLvl, CFrq>SlpLvl, CFrq<SlpLvl | AI1 > SlpLvl |
| T091 | Wake Sel | 16 settings; AI1 > WakLvl, AI1 < WakLvl, AI2 > WakLvl, AI2 < WakLvl, OFrq>WakLvl, OFrq<WakLvl, FB-SP>WakLvl, SP-FB>WakLvl, AI1 > WakDev, AI1 < WakDev, AI2 > WakDev, AI2 < WakDev, OFrq>WakDev, OFrq<WakDev, FB-SP>WakDev, SP-FB>WakDev | AI1 > WakLvl |
| <i>Communications Group</i> | | | |
| C101 | Language | 7 settings; English, Francais, Espanol, Italiano, Deutsch, Portugues, Nederlands | English |
| C102 | Comm Format | 7 settings; RTU 8-N-1, RTU 8-E-1, RTU 8-O-1, RTU 8-N-2, RTU 8-E-2, RTU 8-O-2, MetaSys N2, P1 8-N-1, P1 8-E-1, P1 8-O-1 | RTU 8-N-1 |
| C103 | Comm Data Rate | 6 settings; 1200, 2400, 4800, 9600, 19.2K, 38.4K | 9600 |
| C104 | Comm Node Addr | 1...247 | 100 |
| C105 | Comm Loss Action | 6 settings; Fault, Coast Stop, Stop, Continu Last, Run Preset 0, Kypd Inc/Dec | Fault |
| C106 | Comm Loss Time | 0.1...60.0 s | 5.0 s |
| C107 | Comm Write Mode | 2 settings; Save, RAM Only | Save |
| C108 | Start Source 2 | 7 settings; Keypad, 3-Wire, 2-Wire, 2-Wire Level Sensitive, 2-Wire High Speed, Comm Port, 2-Wire Level Sensitive with Enable | 2-Wire Level Sensitive |
| C109 | Speed Ref 2 | 6 settings; Drive Keypad, Internal Freq, Analog Input 1, Analog Input 2, Preset Freq, Communications Port | Analog Input 1 |
| Advanced Program Group | | | |
| A141 | Purge Frequency | 0.0...320.0 Hz | 5.0 Hz |
| A142 | Internal Freq | 0.00...320.00 Hz | 60.00 Hz |
| A143 | Preset Freq 0 | 0.0...320.0 Hz | 0.0 Hz |
| A144 | Preset Freq 1 | | 5.0 Hz |
| A145 | Preset Freq 2 | | 10.0 Hz |
| A146 | Preset Freq 3 | | 20.0 Hz |
| A147 | Accel Time 2 | 0.00...600.00 s | 30.00 s |
| A148 | Decel Time 2 | 0.01...600.00 s | 30.00 s |
| A149 | S Curve % | 0...100% | 20% |
| A150 | PID Trim Hi | 0.0...320.0 Hz | 60.0 Hz |
| A151 | PID Trim Lo | 0.0...320.0 Hz | 0.0 Hz |
| A152 | PID Ref Sel | 9 settings; PID Disabled, PID Setpoint, Analog In 1, Analog In 2, Comm Port, Setpnt Trim, A-In 1 Trim, A-In 2 Trim, Comm Trim | PID Disabled |
| A153 | PID Feedback Sel | 9 settings; Analog In 1, Analog In 2, Comm Port, ACT1 - ACT2, ACT1 + ACT2, ACT1 * ACT2, ACT1 / ACT2, Min AI, A2, Max AI, A2 | Analog In 1 |
| A154 | PID Prop Gain | 0.00...99.99 | 1.00 |
| A155 | PID Integ Time | 0.0...999.9 s | 2.0 s |
| A156 | PID Diff Rate | 0.00...99.99 (1/s) | 0.00 (1/s) |
| A157 | PID Setpoint | 0.0...100.0% | 0.0% |
| A158 | PID Deadband | 0.0...10.0% | 0.0% |
| A159 | PID Preload | 0.0...320.0 Hz | 0.0 Hz |
| A160 | Process Factor | 0.1...999.9 | 30.0 |
| A163 | Auto Rstrt Tries | 0...9 | 0 |
| A164 | Auto Rstrt Delay | 0.0...160.0 s | 1.0 s |
| A165 | Start At PowerUp | 2 settings; Disabled, Enabled | Disabled |
| A166 | Reverse Disable | 2 settings; Rev Enabled, Rev Disabled | Rev Disabled |
| A167 | Flying Start En | 2 settings; Disabled, Enabled | Disabled |
| A168 | PWM Frequency | 2.0...10.0 kHz (Frame C and D drives); 20 to 8.0 kHz (Frame E, F, G and H drives) | 4.0 kHz |
| A169 | PWM Mode | 2 settings; Space Vector, 2-Phase | 2-Phase |
| A170 | Boost Select | 16 settings Frames C-F; Custom V/Hz, 30.0 VT, 35.0 VT, 40.0 VT, 45.0 VT, 0.0 no IR, 0.0, 2.5, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, 20.0, "Kepco" Curve 16 settings Frames G-H; Custom V/Hz, 30.0 VT, 35.0 VT, 40.0 VT, 45.0 VT, 0.0 no IR, 0.0, 0.2, 0.5, 0.8, 1.0, 2.0, 3.0, 4.0, 5.0, "Kepco" Curve | 45.0, VT |
| A171 | Start Boost | 0.0...25.0% | 2.5% |
| A172 | Break Voltage | 0.0...100.0% | 25.0% |

Parameter List (Continued)

| Parameter Number | Parameter Name | Description | Factory Default |
|------------------|------------------|---|---------------------------|
| A173 | Break Frequency | 0.0...320.0 Hz | 15.0 Hz |
| A174 | Maximum Voltage | 20...Drive Rated Volts | Drive Rated Volts |
| A175 | Slip Hertz @ FLA | 0.0...10.0 Hz | 2.0 Hz |
| A176 | DC Brake Time | 0.0...99.9 Secs | 0.0 s |
| A177 | DC Brake Level | 0.0...(Drive Rated Amps x 1.5) | (Drive Rated Amps x 0.05) |
| A178 | DC Brk Time@Strt | 0.0...99.9 s | 0.0 s |
| A179 | Current Limit 1 | 0.0...(Drive Rated Amps x 1.5) | (Drive Rated Amps x 1.1) |
| A180 | Current Limit 2 | | |
| A181 | Motor OL Select | 3 settings; No Derate, Min Derate, Max Derate | No Derate |
| A182 | Drive OL Mode | 4 settings; Disable, Reduce CLim, Reduce PWM, Both-PWM 1st | Both-PWM 1st |
| A183 | SW Current Trip | 0.0...(Drive Rated Amps x 1.8) | 0.0 |
| A184 | Load Loss Level | 0.0...Drive Rated Amps | 0.0 |
| A185 | Load Loss Time | 0...9999 s | 0 s |
| A186 | Stall Fault Time | 6 settings; 60 s, 120 s, 240 s, 360 s, 480 s, Flt Disabled | 60 s |
| A187 | Bus Reg Mode | 2 settings; Disabled, Enabled | Enabled |
| A188 | Skip Frequency 1 | 0...320 Hz | 0 Hz |
| A189 | Skip Freq Band 1 | 0.0...30.0 Hz | 0.0 Hz |
| A190 | Skip Frequency 2 | 0...320 Hz | 0 Hz |
| A191 | Skip Freq Band 2 | 0.0...30.0 Hz | 0.0 Hz |
| A192 | Skip Frequency 3 | 0...320 Hz | 1 Hz |
| A193 | Skip Freq Band 3 | 0.0...30.0 Hz | 0.0 Hz |
| A194 | Compensation | 4 settings; Disabled, Electrical, Mechanical, Both | Electrical |
| A195 | Reset Meters | 3 settings; Ready/Idle, Reset MWh, Reset Time | Ready/Idle |
| A196 | Testpoint Sel | 1024...65535 | 1024 |
| A197 | Fault Clear | 3 settings; Ready/Idle, Reset Fault, Clear Buffer | Ready/Idle |
| A198 | Program Lock | 4 settings; Unlocked, Locked-All parameters, Locked-Edit via network, Locked-P035 & A170 only | Unlocked |
| A199 | Motor NP Poles | 2...40 | 4 |
| A200 | Motor NP FLA | 0.1...(Drive Rated Amps x 2) | Drive Rated Amps |
| A203 | Wake Deviation | 0.0...100.0% | 0.0% |
| A204 | ACT1 Input | 3 settings; Analog In 1, Analog In 2, Current | Analog In 1 |
| A205 | ACT2 Input | 3 settings; Analog In 1, Analog In 2, Current | Analog In 1 |
| A206 | ACT1 Minimum | 0.0...200.0% | 0.0% |
| A207 | ACT1 Maximum | 0.0...200.0% | 100.0% |
| A208 | ACT2 Minimum | 0.0...200.0% | 0.0% |
| A209 | ACT2 Maximum | 0.0...200.0% | 100.0% |

Aux Relay Card Group

| | | | |
|------|------------------|--|-----------|
| R221 | Relay Out3 Sel | 19 settings; Ready/Fault, At Frequency, MotorRunning, Hand Active, Motor Overld, Ramp Reg, Above Freq, Above Cur, Above DCVolt, Above Anlg 2, Above PF Ang, Anlg In Loss, ParamControl, Retries Exst, NonRec Fault, Reverse, Logic In 1, Logic In 2, Aux Motor | Aux Motor |
| R224 | Relay Out4 Sel | | |
| R227 | Relay Out5 Sel | | |
| R230 | Relay Out6 Sel | | |
| R233 | Relay Out7 Sel | | |
| R236 | Relay Out8 Sel | | |
| R222 | Relay Out3 Level | 0.0...9999 | 0.0 |
| R225 | Relay Out4 Level | | |
| R228 | Relay Out5 Level | | |
| R231 | Relay Out6 Level | | |
| R234 | Relay Out7 Level | | |
| R237 | Relay Out8 Level | | |
| R239 | Aux Motor Mode | 2 settings; Disabled, Enabled | Disabled |
| R240 | Aux Motor Qty | 6 settings; 1 Aux Mtr, 2 Aux Mtr, 3 Aux Mtr, 1 Mtr + Swap, 2 Mtr + Swap, 3 Mtr + Swap | 1 Aux Mtr |

Parameter List (Continued)

| Parameter Number | Parameter Name | Description | Factory Default |
|-------------------------------|-------------------|----------------|-----------------|
| R241 | Aux 1 Start Freq | 0.0...320.0 Hz | 50.0 Hz |
| R244 | Aux 2 Start Freq | | |
| R247 | Aux 3 Start Freq | | |
| R242 | Aux 1 Stop Freq | 0.0...320.0 Hz | 25.0 Hz |
| R245 | Aux 2 Stop Freq | | |
| R248 | Aux 3 Stop Freq | | |
| R243 | Aux 1 Ref Add | 0.0...100.0% | 0.0% |
| R246 | Aux 2 Ref Add | | |
| R249 | Aux 3 Ref Add | | |
| R250 | Aux Start Delay | 0.0...999.9 s | 5.0 s |
| R251 | Aux Stop Delay | 0.0...999.9 s | 3.0 s |
| R252 | Aux Prog Delay | 0.00...60.00 s | 0.50 s |
| R253 | Aux AutoSwap Tme | 0.0...999.9 Hr | 0.0 Hr |
| R254 | Aux AutoSwap Lvl | 0.0...100.0% | 50.0% |
| Advanced Display Group | | | |
| d301 | Control Source | 0...99 | Read Only |
| d302 | Contrl In Status | 0...1 | Read Only |
| d303 | Comm Status | 0...1111 | Read Only |
| d304 | PID Setpnt Displ | 0.0...100.0% | 0.0% |
| d305 | Analog In 1 | 0.0...120.0% | 0.0% |
| d306 | Analog In 2 | | |
| d307 | Fault 1 Code | 0...122 | Read Only |
| d308 | Fault 2 Code | | |
| d309 | Fault 3 Code | | |
| d330 | Fault 4 Code | | |
| d331 | Fault 5 Code | | |
| d332 | Fault 6 Code | | |
| d333 | Fault 7 Code | | |
| d334 | Fault 8 Code | | |
| d335 | Fault 9 Code | | |
| d336 | Fault 10 Code | | |
| d310 | Fault 1 Time-hr | 0...32767 Hr | Read Only |
| d312 | Fault 2 Time-hr | | |
| d314 | Fault 3 Time-hr | | |
| d337 | Fault 4 Time-hr | | |
| d339 | Fault 5 Time-hr | | |
| d341 | Fault 6 Time-hr | | |
| d343 | Fault 7 Time-hr | | |
| d345 | Fault 8 Time-hr | | |
| d347 | Fault 9 Time-hr | | |
| d349 | Fault 10 Time-hr | | |
| d311 | Fault 1 Time-min | 0.0...60.0 Min | Read Only |
| d313 | Fault 2 Time-min | | |
| d315 | Fault 3 Time-min | | |
| d338 | Fault 4 Time-min | | |
| d340 | Fault 5 Time-min | | |
| d342 | Fault 6 Time-min | | |
| d344 | Fault 7 Time-min | | |
| d346 | Fault 8 Time-min | | |
| d348 | Fault 9 Time-min | | |
| d350 | Fault 10 Time-min | | |

Parameter List (Continued)

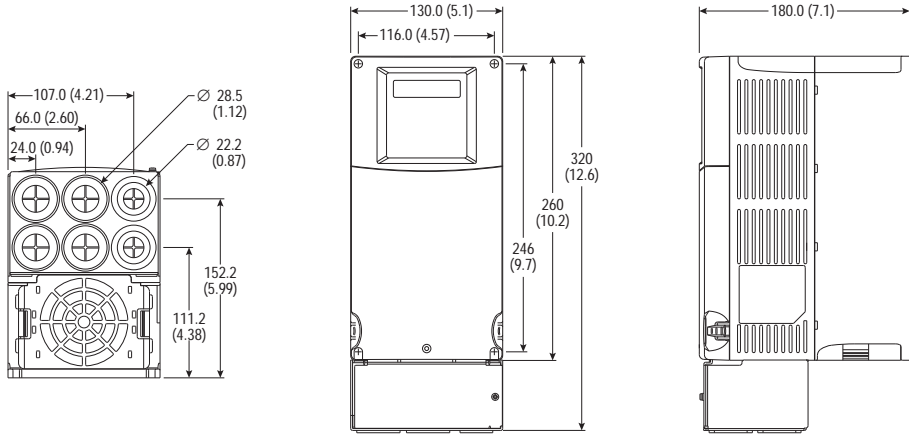
| Parameter Number | Parameter Name | Description | Factory Default |
|------------------|------------------|---|-----------------|
| d316 | Elapsed Time-hr | 0...32767 | Read Only |
| d317 | Elapsed Time-min | 0.0...60.0 Min | Read Only |
| d318 | Output Powr Fctr | 0.0...180.0 deg | Read Only |
| d319 | Testpoint Data | 0...FFFF | Read Only |
| d320 | Control SW Ver | 1.00...99.99 | Read Only |
| d321 | Drive Type | Used by Rockwell Automation Field service personnel | |
| d322 | Output Speed | 0.0...100.0% | Read Only |
| d323 | Output RPM | 0...24000 RPM | Read Only |
| d324 | Fault Frequency | 0.00...320.00 Hz | Read Only |
| d325 | Fault Current | 0.0...(Drive Rated Amps x 2) | Read Only |
| d326 | Fault Bus Volts | 0...820V DC | Read Only |
| d327 | Status @ Fault | 0...1 | Read Only |
| d328 | PID Fdbk Display | -200.0...200.0% | Read Only |
| d329 | DC Bus Ripple V | 0...(410 for 240V AC Drives, 820 for 46V AC Drives)V DC | Read Only |

Approximate Dimensions

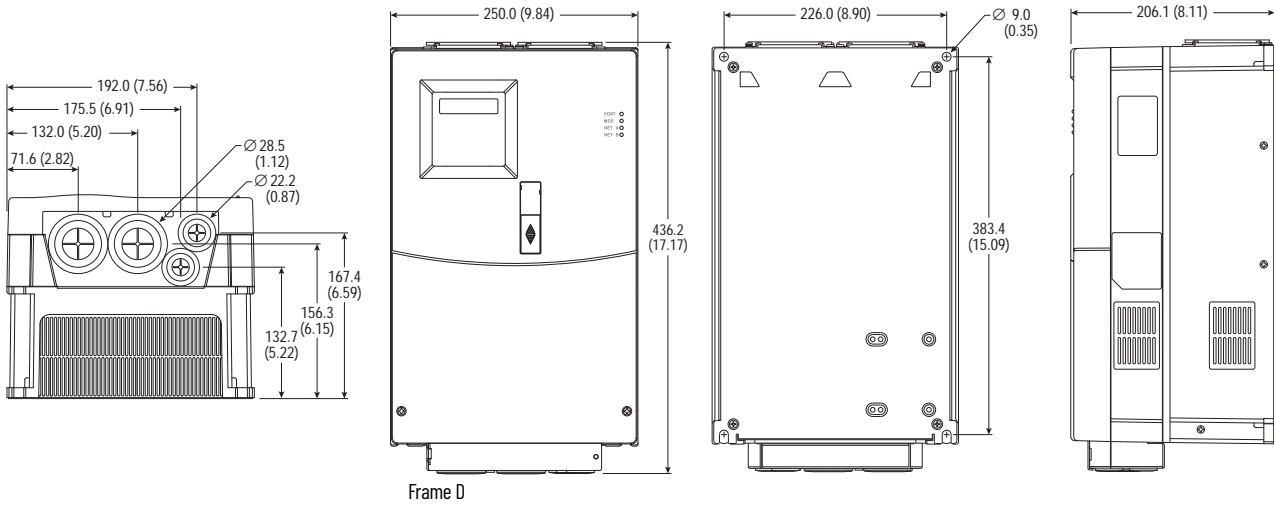
Ratings are in kW and (HP)

| Frame | 240V AC - 3-Phase | | 480V AC - 3-Phase | |
|-------|------------------------|-----------------------|-------------------------------------|--------------------------------|
| C | 2.2 (3.0) 3.7 (5.0) | 5.5 (7.5) 7.5 (10) | 2.2 (3.0) 4.0 (5.0) 5.5 (7.5) | 7.5 (10) 11 (15) 15 (20) |
| D | 11 (15) 15 (20) | 18.5 (25) 22 (30) | 18.5 (25.0) 22.0 (30.0) | 30 (40) |
| E | 30 (40) 37 (50) | | 37.0 (50.0) 45.0 (60.0) | 55 (75) 75 (100) |
| F | - | | 90 (125) | 110 (150) |
| G | - | | 132 (200) | 160 (250) |
| H | - | | 200 (300) | 250 (350) |

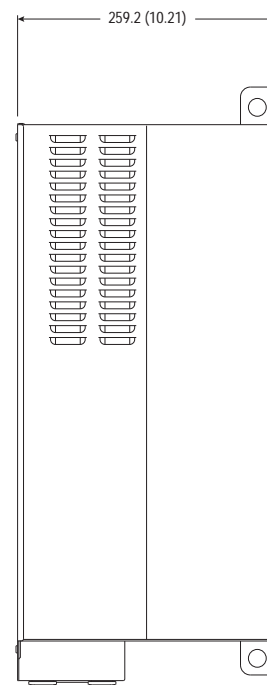
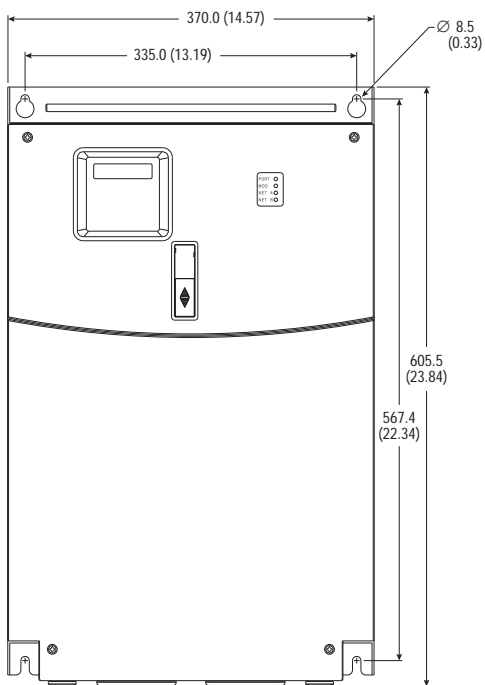
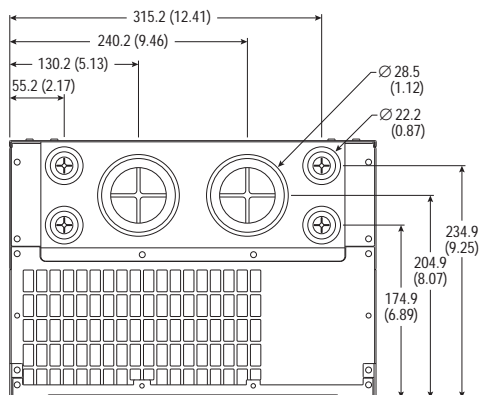
Panel Mount Drive



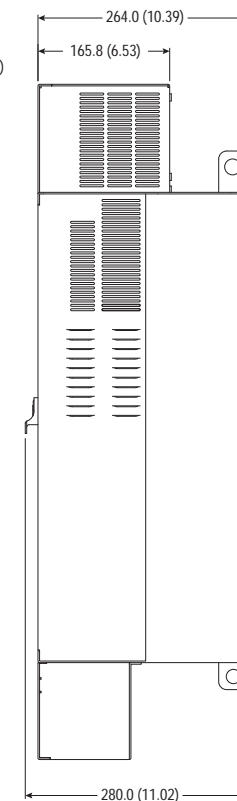
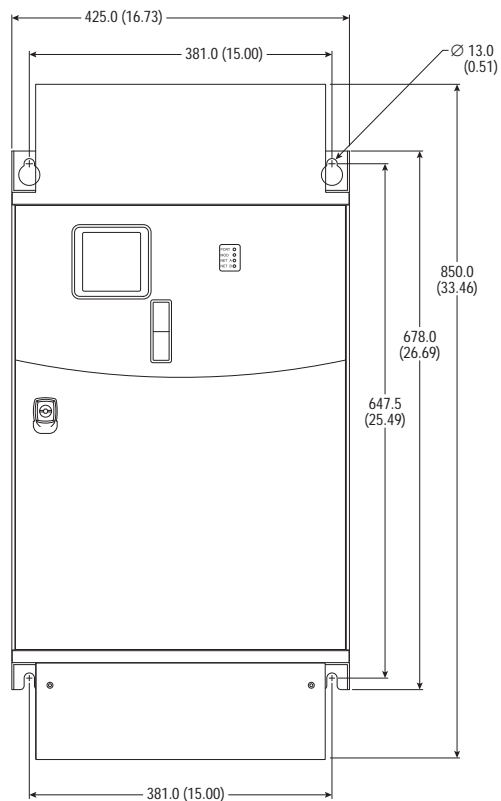
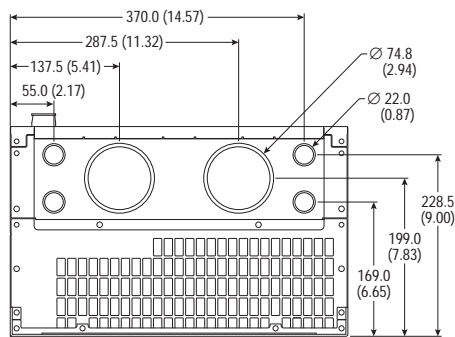
Frame C
(Shown with IP30, NEMA/UL Type 1 conversion kit.)



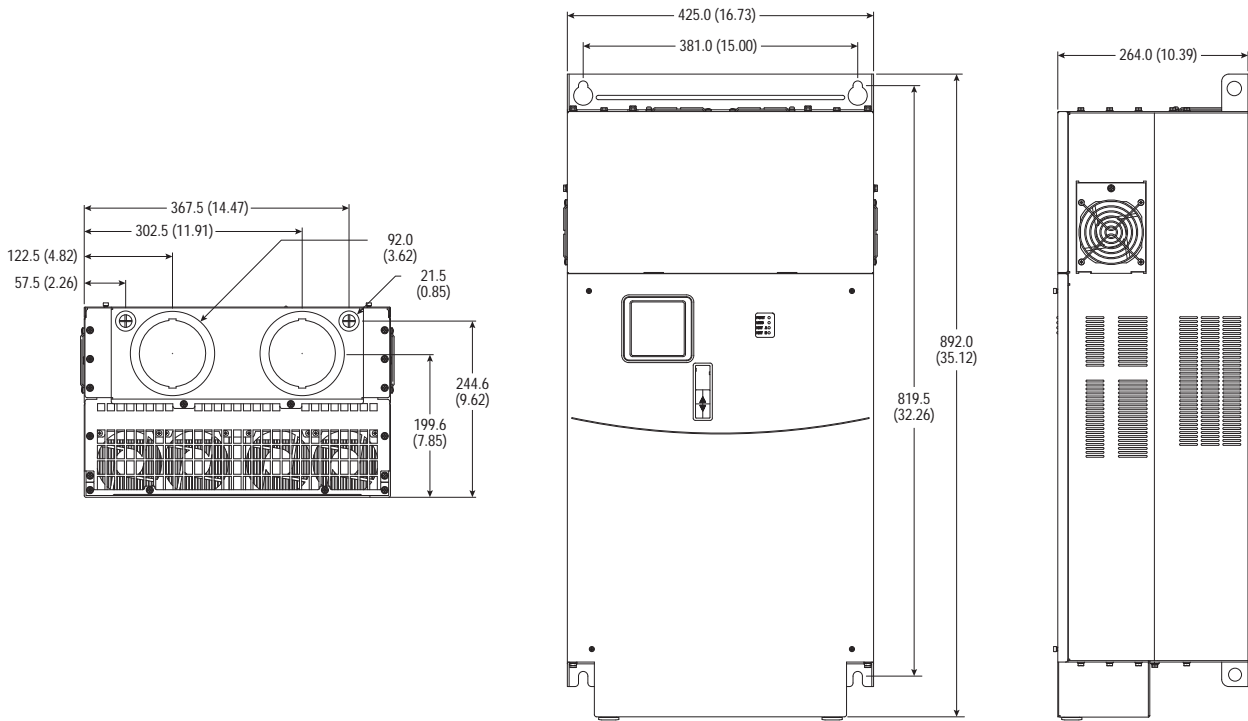
Frame D



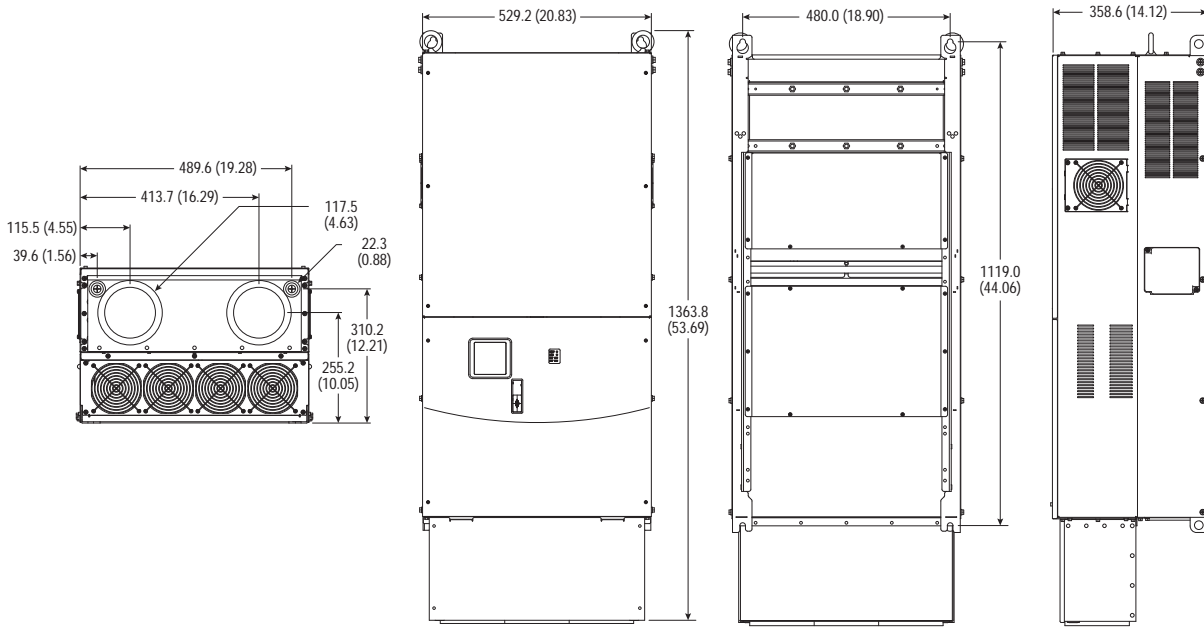
Frame E



Frame F

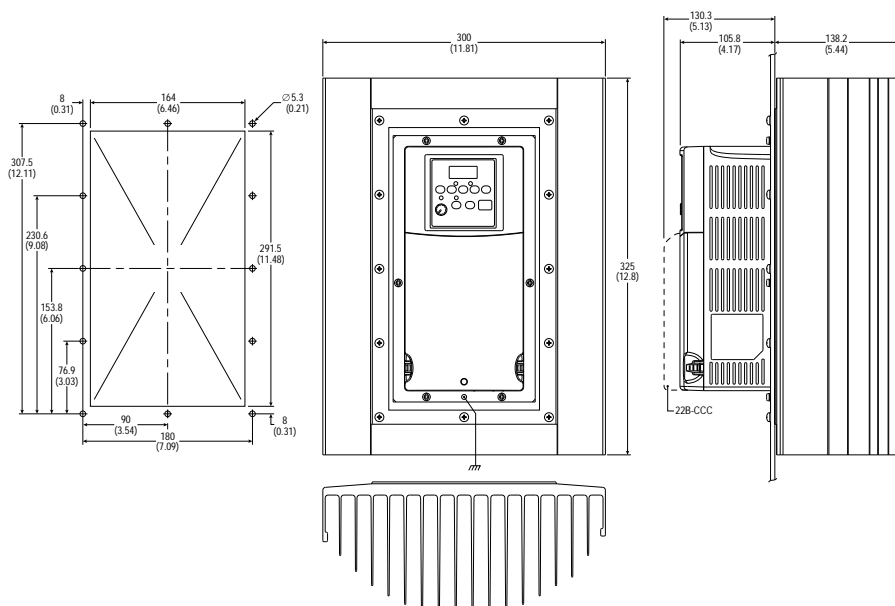


Frame G



Frame H

Flange Mount Drive

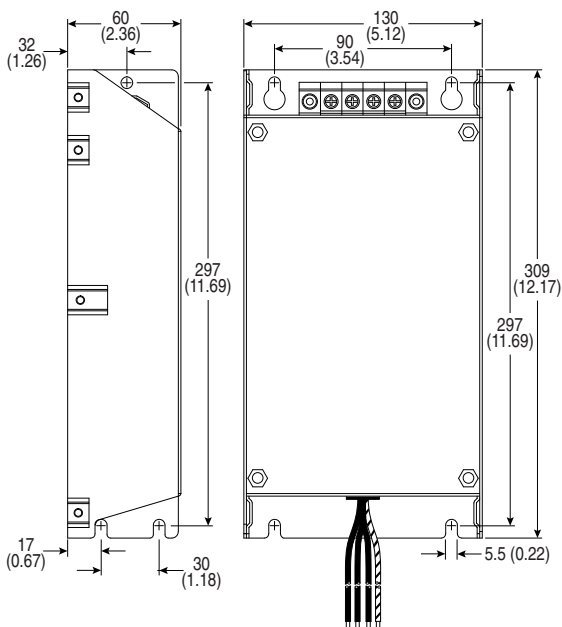


Frame C – Flange Mount

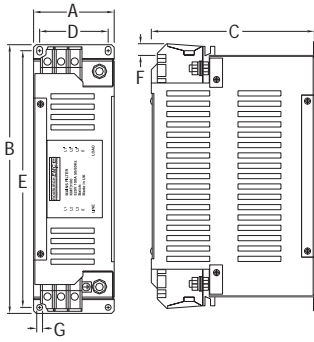
EMC Line Filters

Catalog Numbers: 22-RF018-CS, 22-RF026-CS, 22-RF034-CS

Dimensions are in millimeters and (inches)

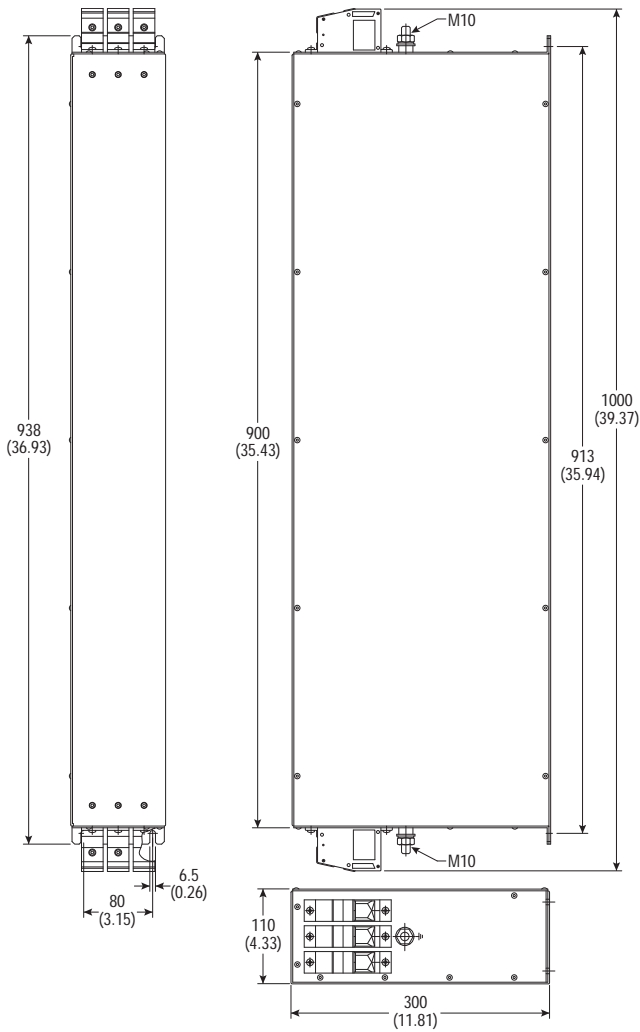


Catalog Numbers: 22-RFD036, 22-RFD050, 22-RFD070, 22-RFD100, 22-RFD150, 22-RFD180



| Catalog No. | A | B | C | D | E | F | G |
|-------------|------------|-------------|------------|------------|-------------|-------------|----------|
| 22-RFD036 | 74 (2.91) | 272 (10.71) | 161 (6.34) | 60 (2.36) | 258 (10.16) | 7.5 (0.30) | 7 (0.28) |
| 22-RFD050 | 93 (3.66) | 312 (12.28) | 190 (7.48) | 79 (3.11) | 298 (11.73) | 13.5 (0.53) | 7 (0.28) |
| 22-RFD070 | 93 (3.66) | 312 (12.28) | 190 (7.48) | 79 (3.11) | 298 (11.73) | 13.5 (0.53) | 7 (0.28) |
| 22-RFD100 | 93 (3.66) | 312 (12.28) | 190 (7.48) | 79 (3.11) | 298 (11.73) | 13.5 (0.53) | 7 (0.28) |
| 22-RFD150 | 126 (4.96) | 312 (12.28) | 224 (8.82) | 112 (4.41) | 298 (11.73) | 19.5 (0.77) | 7 (0.28) |
| 22-RFD180 | 126 (4.96) | 312 (12.28) | 224 (8.82) | 112 (4.41) | 298 (11.73) | 27 (1.06) | 7 (0.28) |

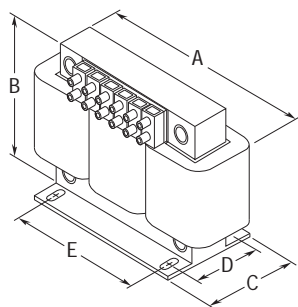
Catalog Number: 22-RFD208



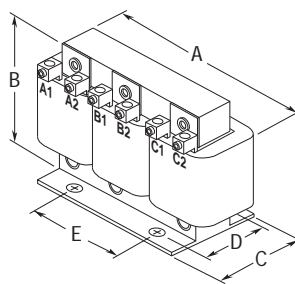
Line Reactors

Dimensions are in millimeters and (inches).

Weights are in kilograms and (pounds).



IP00 (Open) –
45 Amps (fundamental) and Below



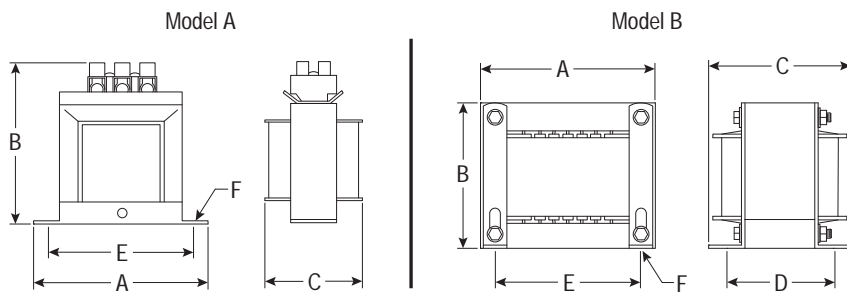
IP00 (Open) –
55 Amps (fundamental) and Above

| Catalog No. | A | B | C | D | E | Weight |
|--------------|-------------|-------------|-------------|------------|------------|------------|
| 1321-3R8-C | 152 (6.00) | 122 (4.80) | 86 (3.40) | 67 (2.62) | 51 (2.00) | 5.0 (11) |
| 1321-3R8-D | 152 (6.00) | 122 (4.80) | 86 (3.40) | 63 (2.48) | 51 (2.00) | 5.9 (13) |
| 1321-3R12-A | 152 (6.00) | 127 (5.00) | 84 (3.30) | 53 (2.10) | 51 (2.00) | 4.1 (9) |
| 1321-3R12-B | 152 (6.00) | 127 (5.00) | 76 (3.00) | 53 (2.10) | 51 (2.00) | 4.5 (10) |
| 1321-3R12-C | 152 (6.00) | 127 (5.00) | 91 (3.60) | 69 (2.73) | 51 (2.00) | 8.2 (18) |
| 1321-3R18-B | 152 (6.00) | 135 (5.30) | 89 (3.50) | 63 (2.48) | 51 (2.00) | 5.5 (12) |
| 1321-3R18-C | 183 (7.20) | 146 (5.76) | 92 (3.63) | 66 (2.60) | 76 (3.00) | 7.3 (16) |
| 1321-3R25-A | 183 (7.20) | 146 (5.76) | 85 (3.35) | 60 (2.35) | 76 (3.00) | 4.9 (11) |
| 1321-3R25-B | 183 (7.20) | 146 (5.76) | 85 (3.35) | 60 (2.35) | 76 (3.00) | 6.3 (14) |
| 1321-3R25-C | 183 (7.20) | 146 (5.76) | 105 (4.10) | 79 (3.10) | 76 (3.00) | 8.1 (18) |
| 1321-3R35-A | 193 (7.60) | 146 (5.76) | 91 (3.60) | 66 (2.60) | 76 (3.00) | 6.3 (14) |
| 1321-3R35-B | 183 (7.20) | 147 (5.80) | 95 (3.75) | 79 (3.10) | 76 (3.00) | 7.3 (16) |
| 1321-3R35-C | 229 (9.00) | 187 (7.35) | 118 (4.66) | 80 (3.16) | 76 (3.00) | 13.6 (30) |
| 1321-3R45-A | 229 (9.00) | 187 (7.35) | 118 (4.66) | 80 (3.16) | 76 (3.00) | 10.4 (23) |
| 1321-3R45-B | 229 (9.00) | 184 (7.25) | 118 (4.66) | 80 (3.16) | 76 (3.00) | 12.7 (28) |
| 1321-3R45-C | 229 (9.00) | 187 (7.35) | 135 (5.30) | 93 (3.66) | 76 (3.00) | 17.7 (39) |
| 1321-3R55-A | 229 (9.00) | 187 (7.35) | 118 (4.66) | 80 (3.16) | 76 (3.00) | 10.9 (24) |
| 1321-3R55-B | 229 (9.00) | 187 (7.35) | 118 (4.66) | 80 (3.16) | 76 (3.00) | 12.3 (27) |
| 1321-3R55-C | 229 (9.00) | 184 (7.25) | 142 (5.60) | 99 (3.90) | 76 (3.00) | 18.6 (41) |
| 1321-3R80-A | 274 (10.80) | 216 (8.50) | 139 (5.47) | 88 (3.47) | 92 (3.63) | 19.5 (43) |
| 1321-3R80-B | 274 (10.80) | 216 (8.50) | 139 (5.47) | 88 (3.47) | 92 (3.63) | 23.1 (51) |
| 1321-3R80-C | 274 (10.80) | 210 (8.26) | 156 (6.16) | 106 (4.16) | 92 (3.63) | 25.0 (55) |
| 1321-3R100-A | 274 (10.80) | 217 (8.55) | 139 (5.47) | 84 (3.30) | 92 (3.63) | 21.3 (47) |
| 1321-3R100-B | 274 (10.80) | 210 (8.25) | 144 (5.66) | 93 (3.66) | 92 (3.63) | 23.1 (51) |
| 1321-3R100-C | 274 (10.80) | 210 (8.25) | 156 (6.16) | 106 (4.16) | 92 (3.63) | 33.6 (74) |
| 1321-3R130-A | 229 (9.00) | 179 (7.04) | 118 (4.66) | 80 (3.16) | 76 (3.00) | 13.2 (29) |
| 1321-3R130-B | 274 (10.80) | 213 (8.40) | 144 (5.66) | 93 (3.66) | 92 (3.63) | 25.9 (57) |
| 1321-3R130-C | 279 (11.00) | 216 (8.50) | 156 (6.16) | 106 (4.16) | 92 (3.63) | 29.0 (64) |
| 1321-3R160-A | 274 (10.80) | 216 (8.50) | 172 (6.80) | 80 (3.16) | 92 (3.63) | 19.0 (42) |
| 1321-3R160-B | 279 (11.00) | 216 (8.50) | 178 (7.00) | 88 (3.47) | 92 (3.63) | 23.0 (51) |
| 1321-3R160-C | 287 (11.30) | 216 (8.50) | 229 (9.00) | 118 (4.66) | 92 (3.63) | 33.0 (72) |
| 1321-3R200-B | 274 (10.80) | 216 (8.50) | 210 (8.30) | 112 (4.41) | 92 (3.63) | 31.0 (67) |
| 1321-3R200-C | 274 (10.80) | 216 (8.50) | 254 (10.00) | 150 (5.91) | 92 (3.63) | 46.0 (100) |
| 1321-3R250-B | 366 (14.40) | 292 (11.50) | 292 (11.50) | 192 (7.56) | 117 (4.60) | 53.5 (118) |
| 1321-3R250-C | 366 (14.40) | 286 (11.25) | 260 (10.25) | 167 (6.56) | 117 (4.60) | 57.0 (125) |
| 1321-3R320-B | 274 (10.80) | 229 (9.00) | 254 (10.00) | 165 (6.50) | 92 (3.63) | 46.3 (102) |
| 1321-3R320-C | 366 (14.40) | 286 (11.25) | 267 (10.50) | 192 (7.56) | 117 (4.60) | 72.6 (160) |
| 1321-3R400-B | 381 (15.00) | 286 (11.25) | 292 (11.50) | 179 (7.06) | 117 (4.60) | 53.5 (118) |
| 1321-3R400-C | 366 (14.40) | 286 (11.25) | 318 (12.50) | 192 (7.56) | 117 (4.60) | 67.6 (149) |
| 1321-3R500-B | 366 (14.40) | 292 (11.50) | 292 (11.50) | 192 (7.56) | 117 (4.60) | 53.5 (118) |
| 1321-3R500-C | 366 (14.40) | 286 (11.25) | 254 (10.00) | 141 (5.56) | 117 (4.60) | 54.4 (120) |

Bus Inductors

Dimensions are in millimeters and (inches).

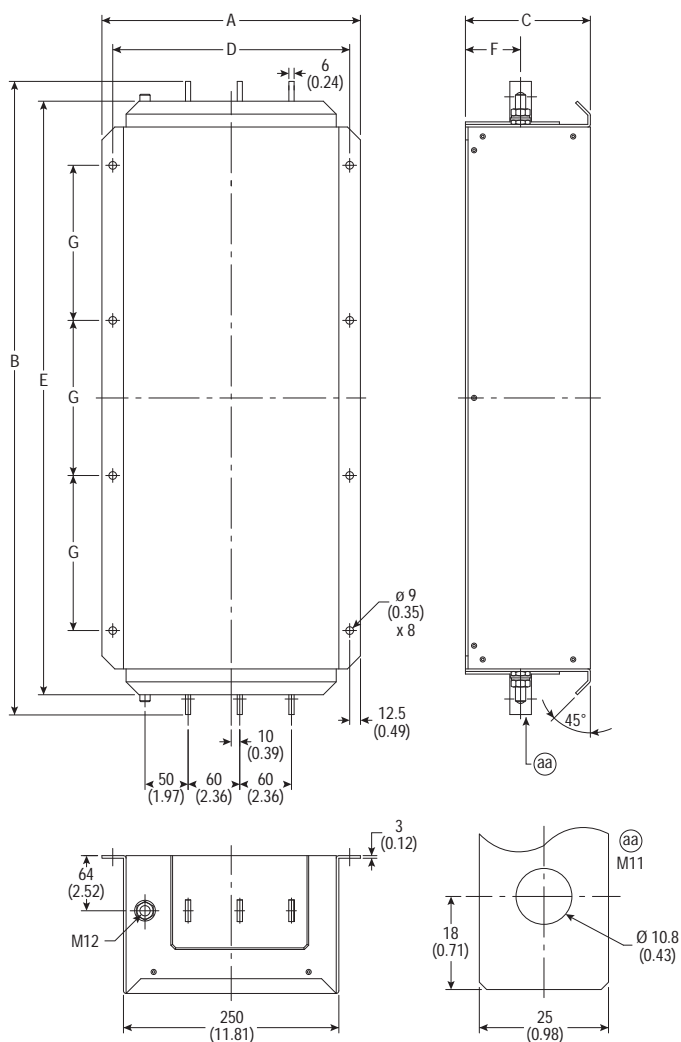
Weights are in kilograms and (pounds).



| Catalog Number | Model | A | B | C | D | E | F | Weight |
|----------------|-------|------------|------------|------------|-----------|------------|------------------|------------|
| 1321-DC9-2 | A | 95 (3.75) | 83 (3.25) | 51 (2.00) | — | 80 (3.13) | 4.7 (0.19) | — |
| 1321-DC12-1 | A | 95 (3.75) | 83 (3.25) | 44 (1.75) | — | 80 (3.13) | 4.7 (0.19) | — |
| 1321-DC12-2 | B | 97 (3.81) | 114 (4.50) | 72 (2.82) | 51 (2.00) | 80 (3.13) | 5x8 (0.20x0.33) | 5.9 (13.0) |
| 1321-DC18-1 | A | 95 (3.75) | 83 (3.25) | 51 (2.00) | — | 80 (3.13) | 4.7 (0.19) | — |
| 1321-DC18-4 | B | 118 (4.63) | 133 (5.25) | 102 (4.00) | 64 (2.50) | 95 (3.75) | 5x8 (0.20x0.33) | 3.6 (8.0) |
| 1321-DC25-4 | B | 97 (3.81) | 114 (4.50) | 76 (3.00) | 64 (2.50) | 80 (3.13) | 5x8 (0.20x0.33) | 5.9 (13.0) |
| 1321-DC32-1 | B | 97 (3.81) | 114 (4.50) | 84 (3.32) | 64 (2.50) | 80 (3.13) | 5x8 (0.20x0.33) | 2.3 (5.0) |
| 1321-DC32-2 | B | 118 (4.63) | 133 (5.25) | 108 (4.25) | 76 (3.00) | 95 (3.75) | 5x8 (0.20x0.33) | 4.5 (10.0) |
| 1321-DC40-2 | B | 97 (3.81) | 114 (4.50) | 95 (3.75) | 76 (3.00) | 80 (3.13) | 5x8 (0.20x0.33) | 3.2 (7.0) |
| 1321-DC40-4 | B | 165 (6.50) | 166 (6.55) | 152 (6.00) | 86 (3.38) | 135 (5.31) | 7x13 (0.28x0.52) | 9.5 (21.0) |

Configured Drives Programs

Catalog Numbers: 22-RFD323 and 22-RFD480



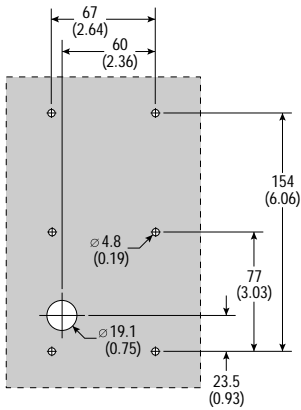
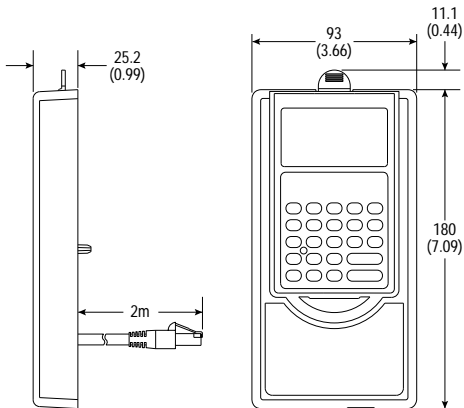
| Catalog No. | A | B | C | D | E | F | G |
|-------------|-------------|-------------|------------|-------------|-------------|-----------|------------|
| 22-RFD323 | 300 (11.81) | 735 (28.94) | 145 (5.71) | 275 (10.83) | 689 (27.13) | 64 (2.52) | 180 (7.09) |
| 22-RFD480 | 300 (11.81) | 882 (34.72) | 145 (5.71) | 275 (10.83) | 836 (32.91) | 64 (2.52) | 240 (9.45) |

Human Interface Module (HIM) Dimensions

NEMA/UL Type 1 Bezel

- Dimensions are in millimeters and (inches)

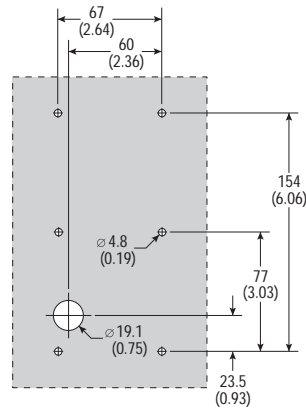
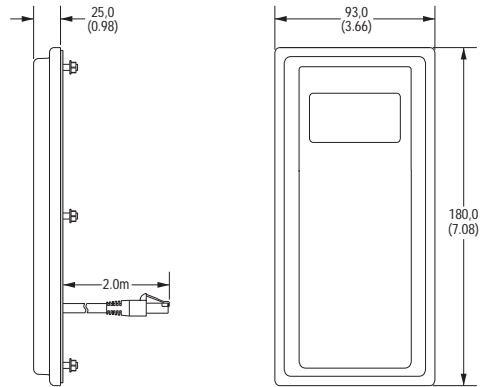
Catalog Number: 22-HIM-B1



NEMA/UL Type 4X/12 Remote (Panel Mount) Small HIM

- Dimensions are in millimeters and (inches)

Catalog Number: 22-HIM-C2S



PowerFlex 400 Packaged Product Overview

Description

The Configured Drives program allows users to create Disconnect and Contactor Bypass packages based on their specific needs and requirements. A limited factory installed option set is offered to optimize package configurations while providing a versatile and cost-effective solution. Configurations feature wall mount construction and are available in different NEMA/UL ratings.

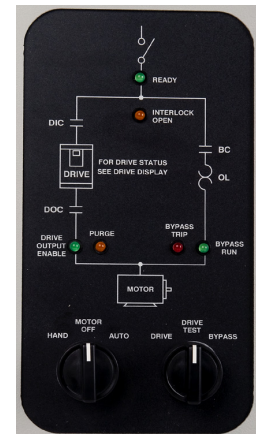
Main Input Disconnect/Circuit Breaker

- Door interlocked main input device
 - Disconnect switch with Class J fuses
 - Thermal magnetic molded case circuit breaker
- High AIC Rating for direct connection to high capacity power distribution lines
 - 100,000 AIC rating with fused disconnect
 - 65,000 AIC rating with circuit breaker



3 Contactor Full Feature Bypass with Disconnect/Circuit Breaker

- Door interlocked main input device
 - Disconnect switch with Class J fuses
 - Thermal magnetic molded case circuit breaker
- 3 contactor manual bypass with Drive/Drive Test/Bypass modes
- Bypass control and status display with indicating LEDs
- Class 20 motor overload protection in bypass circuit
- Selector switch for Hand/Off/Auto
- Remote start capability when in bypass mode

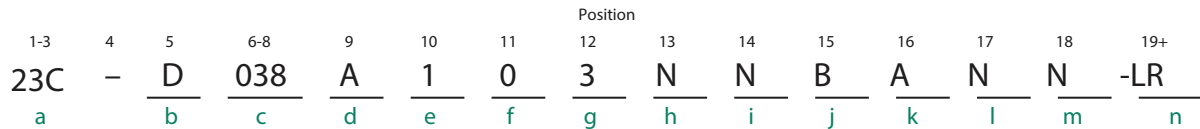


3 Contactor Basic Bypass with Disconnect

- Door interlocked main input disconnect
- 3 contactor manual bypass with Drive/Off/Drive Test/Bypass modes
- User-powered (24V AC) "Drive/Bypass" enable relay is provided for remote shut down



Catalog Number Explanation



a

| Drive | |
|-------|---------------|
| Code | Type |
| 23C | PowerFlex 400 |

b

| Voltage Rating | | |
|----------------|---------|-----|
| Code | Voltage | Ph. |
| X | 208V AC | 3 |
| D | 480V AC | 3 |

c1

| Rating | | | |
|------------------|---------------------|-----------|-------|
| 208V, 60Hz Input | | | |
| Code | Amps ⁽¹⁾ | kW (Hp) | Frame |
| 012 | 12 | 2.2 (3.0) | C |
| 017 | 16.8 | 3.7 (5.0) | C |
| 024 | 24 | 5.5 (7.5) | C |
| 033 | 30.8 | 7.5 (10) | C |
| 049 | 46.2 | 11 (15) | D |
| 065 | 64 | 15 (20) | D |
| 075 | 75 | 18.5 (25) | D |
| 090 | 88 | 22 (30) | D |
| 120 | 114 | 30 (40) | E |
| 145 | 143 | 37 (50) | E |

⁽¹⁾ Configured drive amp ratings may differ from stand-alone drive ratings. Configured drives sized per NEC motor amps.

c2

| Rating | | | |
|------------------|---------------------|-----------|-------|
| 460V, 60Hz Input | | | |
| Code | Amps ⁽¹⁾ | kW (Hp) | Frame |
| 6P0 | 4.8 | 2.2 (3.0) | C |
| 010 | 7.6 | 4.0 (5.0) | C |
| 012 | 11 | 5.5 (7.5) | C |
| 017 | 14 | 7.5 (10) | C |
| 022 | 21 | 11 (15) | C |
| 030 | 27 | 15 (20) | C |
| 038 | 34 | 18.5 (25) | D |
| 045 | 40 | 22 (30) | D |
| 060 | 52 | 30 (40) | D |
| 072 | 65 | 37 (50) | E |
| 088 | 77 | 45 (60) | E |
| 105 | 96 | 55 (75) | E |
| 142 | 124 | 75 (100) | E |
| 170 | 156 | 90 (125) | F |
| 208 | 180 | 110 (150) | F |
| 260 | 240 | 132 (200) | G |
| 310 | 302 | 160 (250) | G |
| 370 | 361 | 200 (300) | H |
| 460 | 414 | 250 (350) | H |

⁽¹⁾ Configured amp ratings may differ from stand-alone drive ratings. Configured drives sized per NEC motor amps.

d

| Enclosure | |
|-----------|-------------------------------------|
| Code | Enclosure |
| A | NEMA/UL Type 1 |
| H | NEMA/UL Type 12 with Fan and Filter |
| X | NEMA/UL Type 3R ⁽¹⁾ |
| E | NEMA/UL Type 4 ⁽¹⁾ |

⁽¹⁾ Designed for maximum ambient temperature of 40° C with no direct sunlight exposure.

e

| HIM | |
|------|------------------|
| Code | Interface Module |
| 1 | Fixed Keypad |

f

| Emission Class | |
|----------------|--------------|
| Code | Rating |
| 0 | Not Filtered |

g

| Version | |
|---------|---------------------|
| Code | Version |
| 3 | RS485 |
| B | BACnet Adapter |
| C | ControlNet Adapter |
| D | DeviceNet Adapter |
| E | EtherNet/IP Adapter |
| L | LonWorks Adapter |
| P | PROFIBUS DP Adapter |

h

| Code | Rating |
|------|----------|
| N | Reserved |

i

| Code | Rating |
|------|----------|
| N | Reserved |

j

| Package | |
|---------|---|
| Code | Description |
| A | Main Input Disconnect |
| B | 3 Contactor Full Feature Bypass with Disconnect |
| C | 3 Contactor Basic Bypass with Disconnect ⁽¹⁾ |
| M | Main Input Circuit Breaker ⁽²⁾ |
| N | 3 Contactor Full Feature Bypass with Circuit Breaker |

⁽¹⁾ Available only with NEMA/UL Type 1 enclosure (Position d = A).

⁽²⁾ Available with all ratings in NEMA/UL Type 12, 3R, or 4 enclosures (Position d = H, X, or E) and 160-250 kW (250-350 Hp) ratings in NEMA/UL Type 1 enclosures (Position d = A).

k

| Control | |
|---------|--------------|
| Code | Description |
| A | Single Motor |

l

| Code | Rating |
|------|----------|
| N | Reserved |

m

| Code | Rating |
|------|----------|
| N | Reserved |

n

| Options | |
|---------|---|
| Code | Description |
| -LR | 3% Input Line Reactor ⁽¹⁾ |
| -E5 | Space Heater - Local Power ⁽²⁾ |

⁽¹⁾ 3% Input Line Reactor not available for all package styles. Consult product selection tables for additional detail.

⁽²⁾ Available with NEMA/UL Type 3R and 4 enclosures only.

PowerFlex 400 NEMA/UL Type 1 Enclosure (Position d = A)

208V AC, Main Input Disconnect

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = A) | |
|---------------|-----|----------------------------|------------|-----------------------------------|--|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | |
| 2.2 | 3.0 | 12 | C | 23C-X012A103NNAANN | |
| 3.7 | 5.0 | 16.8 | C | 23C-X017A103NNAANN | |
| 5.5 | 7.5 | 24 | C | 23C-X024A103NNAANN | |
| 7.5 | 10 | 30.8 | C | 23C-X033A103NNAANN | |
| 11 | 15 | 46.2 | D | 23C-X049A103NNAANN | |
| 15 | 20 | 64 | D | 23C-X065A103NNAANN | |
| 18.5 | 25 | 75 | D | 23C-X075A103NNAANN | |
| 22 | 30 | 88 | D | 23C-X090A103NNAANN | |
| 30 | 40 | 114 | E | 23C-X120A103NNAANN | |
| 37 | 50 | 143 | E | 23C-X145A103NNAANN | |

208V AC, 3 Contactor Full Feature Bypass with Disconnect

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = B) | |
|---------------|-----|----------------------------|------------|-----------------------------------|--|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | |
| 2.2 | 3.0 | 12 | C | 23C-X012A103NNBANN | |
| 3.7 | 5.0 | 16.8 | C | 23C-X017A103NNBANN | |
| 5.5 | 7.5 | 24 | C | 23C-X024A103NNBANN | |
| 7.5 | 10 | 30.8 | C | 23C-X033A103NNBANN | |
| 11 | 15 | 46.2 | D | 23C-X049A103NNBANN | |
| 15 | 20 | 64 | D | 23C-X065A103NNBANN | |
| 18.5 | 25 | 75 | D | 23C-X075A103NNBANN | |
| 22 | 30 | 88 | D | 23C-X090A103NNBANN | |
| 30 | 40 | 114 | E | 23C-X120A103NNBANN | |
| 37 | 50 | 143 | E | 23C-X145A103NNBANN | |

460V AC, Main Input Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = A) | | Circuit Breaker (Position j = M) |
|---------------|-----|----------------------------|------------|-----------------------------------|--|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | | Catalog No. |
| 2.2 | 3.0 | 4.8 | C | 23C-D6P0A103NNAANN | | - |
| 4.0 | 5.0 | 7.6 | C | 23C-D010A103NNAANN | | - |
| 5.5 | 7.5 | 11 | C | 23C-D012A103NNAANN | | - |
| 7.5 | 10 | 14 | C | 23C-D017A103NNAANN | | - |
| 11 | 15 | 21 | C | 23C-D022A103NNAANN | | - |
| 15 | 20 | 27 | C | 23C-D030A103NNAANN | | - |
| 18.5 | 25 | 34 | D | 23C-D038A103NNAANN | | - |
| 22 | 30 | 40 | D | 23C-D045A103NNAANN | | - |
| 30 | 40 | 52 | D | 23C-D060A103NNAANN | | - |
| 37 | 50 | 65 | E | 23C-D072A103NNAANN | | - |
| 45 | 60 | 77 | E | 23C-D088A103NNAANN | | - |
| 55 | 75 | 96 | E | 23C-D105A103NNAANN | | - |
| 75 | 100 | 124 | E | 23C-D142A103NNAANN | | - |
| 90 | 125 | 156 | F | 23C-D170A103NNAANN | | - |
| 110 | 150 | 180 | F | 23C-D208A103NNAANN | | - |
| 132 | 200 | 240 | G | 23C-D260A103NNAANN | | - |
| 160 | 250 | 302 | G | - | | 23C-D310A103NNMANN |
| 200 | 300 | 361 | H | - | | 23C-D370A103NNMANN |
| 250 | 350 | 414 | H | - | | 23C-D460A103NNMANN |

460V AC, 3 Contactor Full Feature Bypass with Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = B) | Circuit Breaker (Position j = N) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 4.8 | C | 23C-D6POA103NNBANN | - |
| 4.0 | 5.0 | 7.6 | C | 23C-D010A103NNBANN | - |
| 5.5 | 7.5 | 11 | C | 23C-D012A103NNBANN | - |
| 7.5 | 10 | 14 | C | 23C-D017A103NNBANN | - |
| 11 | 15 | 21 | C | 23C-D022A103NNBANN | - |
| 15 | 20 | 27 | C | 23C-D030A103NNBANN | - |
| 18.5 | 25 | 34 | D | 23C-D038A103NNBANN | - |
| 22 | 30 | 40 | D | 23C-D045A103NNBANN | - |
| 30 | 40 | 52 | D | 23C-D060A103NNBANN | - |
| 37 | 50 | 65 | E | 23C-D072A103NNBANN | - |
| 45 | 60 | 77 | E | 23C-D088A103NNBANN | - |
| 55 | 75 | 96 | E | 23C-D105A103NNBANN | - |
| 75 | 100 | 124 | E | 23C-D142A103NNBANN | - |
| 90 | 125 | 156 | F | 23C-D170A103NNBANN | - |
| 110 | 150 | 180 | F | 23C-D208A103NNBANN | - |
| 132 | 200 | 240 | G | 23C-D260A103NNBANN | - |
| 160 | 250 | 302 | G | - | 23C-D310A103NNNANN |
| 200 | 300 | 361 | H | - | 23C-D370A103NNNANN |
| 250 | 350 | 414 | H | - | 23C-D460A103NNNANN |

460V AC, 3 Contactor Basic Bypass with Disconnect

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = C) |
|---------------|-----|----------------------------|------------|-----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. |
| 2.2 | 3.0 | 4.8 | C | 23C-D6POA103NNCANN |
| 4.0 | 5.0 | 7.6 | C | 23C-D010A103NNCANN |
| 5.5 | 7.5 | 11 | C | 23C-D012A103NNCANN |
| 7.5 | 10 | 14 | C | 23C-D017A103NNCANN |
| 11 | 15 | 21 | C | 23C-D022A103NNCANN |
| 15 | 20 | 27 | C | 23C-D030A103NNCANN |
| 18.5 | 25 | 34 | D | 23C-D038A103NNCANN |
| 22 | 30 | 40 | D | 23C-D045A103NNCANN |
| 30 | 40 | 52 | D | 23C-D060A103NNCANN |
| 37 | 50 | 65 | E | 23C-D072A103NNCANN |
| 45 | 60 | 77 | E | 23C-D088A103NNCANN |
| 55 | 75 | 96 | E | 23C-D105A103NNCANN |
| 75 | 100 | 124 | E | 23C-D142A103NNCANN |

PowerFlex 400 NEMA/UL Type 12 Enclosure (Position d = H)

208V AC, Main Input Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = A) | Circuit Breaker (Position j = M) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 12 | C | 23C-X012H103NNAANN | 23C-X012H103NNMANN |
| 3.7 | 5.0 | 16.8 | C | 23C-X017H103NNAANN | 23C-X017H103NNMANN |
| 5.5 | 7.5 | 24 | C | 23C-X024H103NNAANN | 23C-X024H103NNMANN |
| 7.5 | 10 | 30.8 | C | 23C-X033H103NNAANN | 23C-X033H103NNMANN |
| 11 | 15 | 46.2 | D | 23C-X049H103NNAANN | 23C-X049H103NNMANN |
| 15 | 20 | 64 | D | 23C-X065H103NNAANN | 23C-X065H103NNMANN |
| 18.5 | 25 | 75 | D | 23C-X075H103NNAANN | 23C-X075H103NNMANN |
| 22 | 30 | 88 | D | 23C-X090H103NNAANN | 23C-X090H103NNMANN |
| 30 | 40 | 114 | E | 23C-X120H103NNAANN | 23C-X120H103NNMANN |
| 37 | 50 | 143 | E | 23C-X145H103NNAANN | 23C-X145H103NNMANN |

208V AC, 3 Contactor Full Feature Bypass with Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = B) | Circuit Breaker (Position j = N) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 12 | C | 23C-X012H103NNBANN | 23C-X012H103NNNANN |
| 3.7 | 5.0 | 16.8 | C | 23C-X017H103NNBANN | 23C-X017H103NNNANN |
| 5.5 | 7.5 | 24 | C | 23C-X024H103NNBANN | 23C-X024H103NNNANN |
| 7.5 | 10 | 30.8 | C | 23C-X033H103NNBANN | 23C-X033H103NNNANN |
| 11 | 15 | 46.2 | D | 23C-X049H103NNBANN | 23C-X049H103NNNANN |
| 15 | 20 | 64 | D | 23C-X065H103NNBANN | 23C-X065H103NNNANN |
| 18.5 | 25 | 75 | D | 23C-X075H103NNBANN | 23C-X075H103NNNANN |
| 22 | 30 | 88 | D | 23C-X090H103NNBANN | 23C-X090H103NNNANN |
| 30 | 40 | 114 | E | 23C-X120H103NNBANN | 23C-X120H103NNNANN |
| 37 | 50 | 143 | E | 23C-X145H103NNBANN | 23C-X145H103NNNANN |

460V AC, Main Input Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = A) | Circuit Breaker (Position j = M) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 4.8 | C | 23C-D6POH103NNAANN | 23C-D6POH103NNMANN |
| 4.0 | 5.0 | 7.6 | C | 23C-D010H103NNAANN | 23C-D010H103NNMANN |
| 5.5 | 7.5 | 11 | C | 23C-D012H103NNAANN | 23C-D012H103NNMANN |
| 7.5 | 10 | 14 | C | 23C-D017H103NNAANN | 23C-D017H103NNMANN |
| 11 | 15 | 21 | C | 23C-D022H103NNAANN | 23C-D022H103NNMANN |
| 15 | 20 | 27 | C | 23C-D030H103NNAANN | 23C-D030H103NNMANN |
| 18.5 | 25 | 34 | D | 23C-D038H103NNAANN | 23C-D038H103NNMANN |
| 22 | 30 | 40 | D | 23C-D045H103NNAANN | 23C-D045H103NNMANN |
| 30 | 40 | 52 | D | 23C-D060H103NNAANN | 23C-D060H103NNMANN |
| 37 | 50 | 65 | E | 23C-D072H103NNAANN | 23C-D072H103NNMANN |
| 45 | 60 | 77 | E | 23C-D088H103NNAANN | 23C-D088H103NNMANN |
| 55 | 75 | 96 | E | 23C-D105H103NNAANN | 23C-D105H103NNMANN |
| 75 | 100 | 124 | E | 23C-D142H103NNAANN | 23C-D142H103NNMANN |
| 90 | 125 | 156 | F | 23C-D170H103NNAANN | 23C-D170H103NNMANN |
| 110 | 150 | 180 | F | 23C-D208H103NNAANN | 23C-D208H103NNMANN |

460V AC, 3 Contactor Full Feature Bypass with Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = B) | Circuit Breaker (Position j = N) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 4.8 | C | 23C-D6POH103NNBANN | 23C-D6POH103NNNANN |
| 4.0 | 5.0 | 7.6 | C | 23C-D010H103NNBANN | 23C-D010H103NNNANN |
| 5.5 | 7.5 | 11 | C | 23C-D012H103NNBANN | 23C-D012H103NNNANN |
| 7.5 | 10 | 14 | C | 23C-D017H103NNBANN | 23C-D017H103NNNANN |
| 11 | 15 | 21 | C | 23C-D022H103NNBANN | 23C-D022H103NNNANN |
| 15 | 20 | 27 | C | 23C-D030H103NNBANN | 23C-D030H103NNNANN |
| 18.5 | 25 | 34 | D | 23C-D038H103NNBANN | 23C-D038H103NNNANN |
| 22 | 30 | 40 | D | 23C-D045H103NNBANN | 23C-D045H103NNNANN |
| 30 | 40 | 52 | D | 23C-D060H103NNBANN | 23C-D060H103NNNANN |
| 37 | 50 | 65 | E | 23C-D072H103NNBANN | 23C-D072H103NNNANN |
| 45 | 60 | 77 | E | 23C-D088H103NNBANN | 23C-D088H103NNNANN |
| 55 | 75 | 96 | E | 23C-D105H103NNBANN | 23C-D105H103NNNANN |
| 75 | 100 | 124 | E | 23C-D142H103NNBANN | 23C-D142H103NNNANN |
| 90 | 125 | 156 | F | 23C-D170H103NNBANN | 23C-D170H103NNNANN |
| 110 | 150 | 180 | F | 23C-D208H103NNBANN | 23C-D208H103NNNANN |

PowerFlex 400 NEMA/UL Type 3R Enclosure (Position d = X)

208V AC, Main Input Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = A) | Circuit Breaker (Position j = M) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 12 | C | 23C-X012X103NNAANN | 23C-X012X103NNMANN |
| 3.7 | 5.0 | 16.8 | C | 23C-X017X103NNAANN | 23C-X017X103NNMANN |
| 5.5 | 7.5 | 24 | C | 23C-X024X103NNAANN | 23C-X024X103NNMANN |
| 7.5 | 10 | 30.8 | C | 23C-X033X103NNAANN | 23C-X033X103NNMANN |
| 11 | 15 | 46.2 | D | 23C-X049X103NNAANN | 23C-X049X103NNMANN |
| 15 | 20 | 64 | D | 23C-X065X103NNAANN | 23C-X065X103NNMANN |
| 18.5 | 25 | 75 | D | 23C-X075X103NNAANN | 23C-X075X103NNMANN |
| 22 | 30 | 88 | D | 23C-X090X103NNAANN | 23C-X090X103NNMANN |
| 30 | 40 | 114 | E | 23C-X120X103NNAANN | 23C-X120X103NNMANN |
| 37 | 50 | 143 | E | 23C-X145X103NNAANN | 23C-X145X103NNMANN |

208V AC, 3 Contactor Full Feature Bypass with Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = B) | Circuit Breaker (Position j = N) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 12 | C | 23C-X012X103NNBANN | 23C-X012X103NNNANN |
| 3.7 | 5.0 | 16.8 | C | 23C-X017X103NNBANN | 23C-X017X103NNNANN |
| 5.5 | 7.5 | 24 | C | 23C-X024X103NNBANN | 23C-X024X103NNNANN |
| 7.5 | 10 | 30.8 | C | 23C-X033X103NNBANN | 23C-X033X103NNNANN |
| 11 | 15 | 46.2 | D | 23C-X049X103NNBANN | 23C-X049X103NNNANN |
| 15 | 20 | 64 | D | 23C-X065X103NNBANN | 23C-X065X103NNNANN |
| 18.5 | 25 | 75 | D | 23C-X075X103NNBANN | 23C-X075X103NNNANN |
| 22 | 30 | 88 | D | 23C-X090X103NNBANN | 23C-X090X103NNNANN |
| 30 | 40 | 114 | E | 23C-X120X103NNBANN | 23C-X120X103NNNANN |
| 37 | 50 | 143 | E | 23C-X145X103NNBANN | 23C-X145X103NNNANN |

460V AC, Main Input Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = A) | Circuit Breaker (Position j = M) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 4.8 | C | 23C-D6POX103NNAANN | 23C-D6POX103NNMANN |
| 4.0 | 5.0 | 7.6 | C | 23C-D010X103NNAANN | 23C-D010X103NNMANN |
| 5.5 | 7.5 | 11 | C | 23C-D012X103NNAANN | 23C-D012X103NNMANN |
| 7.5 | 10 | 14 | C | 23C-D017X103NNAANN | 23C-D017X103NNMANN |
| 11 | 15 | 21 | C | 23C-D022X103NNAANN | 23C-D022X103NNMANN |
| 15 | 20 | 27 | C | 23C-D030X103NNAANN | 23C-D030X103NNMANN |
| 18.5 | 25 | 34 | D | 23C-D038X103NNAANN | 23C-D038X103NNMANN |
| 22 | 30 | 40 | D | 23C-D045X103NNAANN | 23C-D045X103NNMANN |
| 30 | 40 | 52 | D | 23C-D060X103NNAANN | 23C-D060X103NNMANN |
| 37 | 50 | 65 | E | 23C-D072X103NNAANN | 23C-D072X103NNMANN |
| 45 | 60 | 77 | E | 23C-D088X103NNAANN | 23C-D088X103NNMANN |
| 55 | 75 | 96 | E | 23C-D105X103NNAANN | 23C-D105X103NNMANN |
| 75 | 100 | 124 | E | 23C-D142X103NNAANN | 23C-D142X103NNMANN |
| 90 | 125 | 156 | F | 23C-D170X103NNAANN | 23C-D170X103NNMANN |
| 110 | 150 | 180 | F | 23C-D208X103NNAANN | 23C-D208X103NNMANN |

460V AC, 3 Contactor Full Feature Bypass with Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = B) | Circuit Breaker (Position j = N) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 4.8 | C | 23C-D6POX103NNBANN | 23C-D6POX103NNNANN |
| 4.0 | 5.0 | 7.6 | C | 23C-D010X103NNBANN | 23C-D010X103NNNANN |
| 5.5 | 7.5 | 11 | C | 23C-D012X103NNBANN | 23C-D012X103NNNANN |
| 7.5 | 10 | 14 | C | 23C-D017X103NNBANN | 23C-D017X103NNNANN |
| 11 | 15 | 21 | C | 23C-D022X103NNBANN | 23C-D022X103NNNANN |
| 15 | 20 | 27 | C | 23C-D030X103NNBANN | 23C-D030X103NNNANN |
| 18.5 | 25 | 34 | D | 23C-D038X103NNBANN | 23C-D038X103NNNANN |
| 22 | 30 | 40 | D | 23C-D045X103NNBANN | 23C-D045X103NNNANN |
| 30 | 40 | 52 | D | 23C-D060X103NNBANN | 23C-D060X103NNNANN |
| 37 | 50 | 65 | E | 23C-D072X103NNBANN | 23C-D072X103NNNANN |
| 45 | 60 | 77 | E | 23C-D088X103NNBANN | 23C-D088X103NNNANN |
| 55 | 75 | 96 | E | 23C-D105X103NNBANN | 23C-D105X103NNNANN |
| 75 | 100 | 124 | E | 23C-D142X103NNBANN | 23C-D142X103NNNANN |
| 90 | 125 | 156 | F | 23C-D170X103NNBANN | 23C-D170X103NNNANN |
| 110 | 150 | 180 | F | 23C-D208X103NNBANN | 23C-D208X103NNNANN |

PowerFlex 400 NEMA/UL Type 4 Enclosure (Position d = E)

208V AC, Main Input Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = A) | Circuit Breaker (Position j = M) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 12 | C | 23C-X012E103NNAANN | 23C-X012E103NNMANN |
| 3.7 | 5.0 | 16.8 | C | 23C-X017E103NNAANN | 23C-X017E103NNMANN |
| 5.5 | 7.5 | 24 | C | 23C-X024E103NNAANN | 23C-X024E103NNMANN |
| 7.5 | 10 | 30.8 | C | 23C-X033E103NNAANN | 23C-X033E103NNMANN |
| 11 | 15 | 46.2 | D | 23C-X049E103NNAANN | 23C-X049E103NNMANN |
| 15 | 20 | 64 | D | 23C-X065E103NNAANN | 23C-X065E103NNMANN |
| 18.5 | 25 | 75 | D | 23C-X075E103NNAANN | 23C-X075E103NNMANN |
| 22 | 30 | 88 | D | 23C-X090E103NNAANN | 23C-X090E103NNMANN |
| 30 | 40 | 114 | E | 23C-X120E103NNAANN | 23C-X120E103NNMANN |
| 37 | 50 | 143 | E | 23C-X145E103NNAANN | 23C-X145E103NNMANN |

208V AC, 3 Contactor Full Feature Bypass with Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = B) | Circuit Breaker (Position j = N) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 12 | C | 23C-X012E103NNBANN | 23C-X012E103NNNANN |
| 3.7 | 5.0 | 16.8 | C | 23C-X017E103NNBANN | 23C-X017E103NNNANN |
| 5.5 | 7.5 | 24 | C | 23C-X024E103NNBANN | 23C-X024E103NNNANN |
| 7.5 | 10 | 30.8 | C | 23C-X033E103NNBANN | 23C-X033E103NNNANN |
| 11 | 15 | 46.2 | D | 23C-X049E103NNBANN | 23C-X049E103NNNANN |
| 15 | 20 | 64 | D | 23C-X065E103NNBANN | 23C-X065E103NNNANN |
| 18.5 | 25 | 75 | D | 23C-X075E103NNBANN | 23C-X075E103NNNANN |
| 22 | 30 | 88 | D | 23C-X090E103NNBANN | 23C-X090E103NNNANN |
| 30 | 40 | 114 | E | 23C-X120E103NNBANN | 23C-X120E103NNNANN |
| 37 | 50 | 143 | E | 23C-X145E103NNBANN | 23C-X145E103NNNANN |

460V AC, Main Input Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = A) | Circuit Breaker (Position j = M) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 4.8 | C | 23C-D6P0E103NNAANN | 23C-D6P0E103NNMANN |
| 4.0 | 5.0 | 7.6 | C | 23C-D010E103NNAANN | 23C-D010E103NNMANN |
| 5.5 | 7.5 | 11 | C | 23C-D012E103NNAANN | 23C-D012E103NNMANN |
| 7.5 | 10 | 14 | C | 23C-D017E103NNAANN | 23C-D017E103NNMANN |
| 11 | 15 | 21 | C | 23C-D022E103NNAANN | 23C-D022E103NNMANN |
| 15 | 20 | 27 | C | 23C-D030E103NNAANN | 23C-D030E103NNMANN |
| 18.5 | 25 | 34 | D | 23C-D038E103NNAANN | 23C-D038E103NNMANN |
| 22 | 30 | 40 | D | 23C-D045E103NNAANN | 23C-D045E103NNMANN |
| 30 | 40 | 52 | D | 23C-D060E103NNAANN | 23C-D060E103NNMANN |
| 37 | 50 | 65 | E | 23C-D072E103NNAANN | 23C-D072E103NNMANN |
| 45 | 60 | 77 | E | 23C-D088E103NNAANN | 23C-D088E103NNMANN |
| 55 | 75 | 96 | E | 23C-D105E103NNAANN | 23C-D105E103NNMANN |
| 75 | 100 | 124 | E | 23C-D142E103NNAANN | 23C-D142E103NNMANN |
| 90 | 125 | 156 | F | 23C-D170E103NNAANN | 23C-D170E103NNMANN |
| 110 | 150 | 180 | F | 23C-D208E103NNAANN | 23C-D208E103NNMANN |

460V AC, 3 Contactor Full Feature Bypass with Disconnect/Circuit Breaker

| Drive Ratings | | | Frame Size | Fused Disconnect (Position j = B) | Circuit Breaker (Position j = N) |
|---------------|-----|----------------------------|------------|-----------------------------------|----------------------------------|
| kW | HP | Output Current Amps (40°C) | | Catalog No. | Catalog No. |
| 2.2 | 3.0 | 4.8 | C | 23C-D6P0E103NNBANN | 23C-D6P0E103NNNANN |
| 4.0 | 5.0 | 7.6 | C | 23C-D010E103NNBANN | 23C-D010E103NNNANN |
| 5.5 | 7.5 | 11 | C | 23C-D012E103NNBANN | 23C-D012E103NNNANN |
| 7.5 | 10 | 14 | C | 23C-D017E103NNBANN | 23C-D017E103NNNANN |
| 11 | 15 | 21 | C | 23C-D022E103NNBANN | 23C-D022E103NNNANN |
| 15 | 20 | 27 | C | 23C-D030E103NNBANN | 23C-D030E103NNNANN |
| 18.5 | 25 | 34 | D | 23C-D038E103NNBANN | 23C-D038E103NNNANN |
| 22 | 30 | 40 | D | 23C-D045E103NNBANN | 23C-D045E103NNNANN |
| 30 | 40 | 52 | D | 23C-D060E103NNBANN | 23C-D060E103NNNANN |
| 37 | 50 | 65 | E | 23C-D072E103NNBANN | 23C-D072E103NNNANN |
| 45 | 60 | 77 | E | 23C-D088E103NNBANN | 23C-D088E103NNNANN |
| 55 | 75 | 96 | E | 23C-D105E103NNBANN | 23C-D105E103NNNANN |
| 75 | 100 | 124 | E | 23C-D142E103NNBANN | 23C-D142E103NNNANN |
| 90 | 125 | 156 | F | 23C-D170E103NNBANN | 23C-D170E103NNNANN |
| 110 | 150 | 180 | F | 23C-D208E103NNBANN | 23C-D208E103NNNANN |

Factory Installed Options

Internal Communication Adapters

| Description | Catalog Code (Position 12) |
|-------------|----------------------------|
| RS485 | 3 |
| BACnet | B |
| ControlNet | C |
| DeviceNet | D |
| EtherNet/IP | E |
| LonWorks | L |
| PROFIBUS DP | P |

Options

| Description | Catalog Code (Position 12) |
|------------------------|----------------------------|
| 3% Input Line Reactor | -LR ⁽¹⁾ |
| Enclosure Space Heater | -E5 ⁽²⁾ |

(1) 3% input line reactor not available for all package styles

(2) Available with NEMA/UL Type 3R and four enclosures only.

Notes:

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

| Resource | Description |
|--|---|
| EtherNet/IP Network Devices User Manual, ENET-UM006 | Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network. |
| Ethernet Reference Manual, ENET-RM002 | Describes basic Ethernet concepts, infrastructure components, and infrastructure features. |
| System Security Design Guidelines Reference Manual, SECURE-RM001 | Provides guidance on how to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment. |
| Industrial Components Preventive Maintenance, Enclosures, and Contact Ratings Specifications, publication IC-TD002 | Provides a quick reference tool for Allen-Bradley industrial automation controls and assemblies. |
| Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control, publication SGI-1.1 | Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components. |
| Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1 | Provides general guidelines for installing a Rockwell Automation industrial system. |
| Product Certifications website, rok.auto/certifications . | Provides declarations of conformity, certificates, and other certification details. |

You can view or download publications at rok.auto/literature.

Rockwell Automation Support

Use these resources to access support information.

| | | |
|---|--|--|
| Technical Support Center | Find help with how-to videos, FAQs, chat, user forums, and product notification updates. | rok.auto/support |
| Knowledgebase | Access Knowledgebase articles. | rok.auto/knowledgebase |
| Local Technical Support Phone Numbers | Locate the telephone number for your country. | rok.auto/phonesupport |
| Literature Library | Find installation instructions, manuals, brochures, and technical data publications. | rok.auto/literature |
| Product Compatibility and Download Center (PCDC) | Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes. | rok.auto/pcdc |

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Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.





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