Technical Data

Original Instructions

PowerFlex 40P Adjustable Frequency AC Drives

Bulletin Number 22D

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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
Added Inclusive Language Acknowledgment	2
Updated functional safety rating	3, 8, 9, 10
Updated section PowerFlex 40P PC Programming Software	4
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Added 100-E contactors to table Drive Ratings - PowerFlex 40P	19...20
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Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

Product Overview

As part of the industry leading PowerFlex® family of AC drives, the PowerFlex 40P adjustable frequency AC drive addresses your needs for closed loop control and functional safety up to SIL 2/PL d in a compact and cost effective design. The PowerFlex 40P AC drive is based on the popular PowerFlex 40 AC drive platform and shares common options and accessories. Available in power ratings from 0.4...11 kW (0.5...15 HP) and in voltage classes of 240, 480, and 600 volts, PowerFlex 40P AC drives are designed to meet global OEM and end-user demands for flexibility, space savings, and ease of use. PowerFlex 40P AC drives are cost-effective solutions for speed control of applications such as diverters, smart conveyors, packaging machines, palletizers, drafting machines, ring spinning machines, and synthetic fiber spinning machines.



Flexible Packaging and Mounting Options

- Versatile packaging options allow for panel mount NEMA 1/IP30 as well as NEMA 4/IP66 (with like enclosure) using the plate/flange drives.
- Plate drives also allow for a reduction in overall enclosure size based on a 75% reduction in enclosed Watts.
- Installation can be a virtual snap using the DIN rail mounting feature on B frame drives. Panel mounting is also available, providing added flexibility.
- An optional IP30 (NEMA 1) conduit box is easily adapted to the standard IP20 (NEMA Type Open) product, providing increased environmental ratings.
- Zero Stacking is allowable for ambient temperatures up to 40 °C (104 °F), saving valuable panel space. 50 °C (122 °F) ambient temperatures are permitted with minimal spacing between drives.
- External filters are available for all PowerFlex 40P drive ratings to meet EN55011, Class A and B EMC requirements.

Start Up, Programming, and Operation

- PowerFlex 40P drive programming is achieved by the use of an external Human Interface Module (HIM) or via the resident Display Serial Interface (DSI) connection and the PC programming tool.
  - Connected Components Workbench™
  - DriveTools™ SP
- StepLogic® wizards available for DriveTools SP assist in setup of position or velocity StepLogic programming.
- An integral display and reset button allows user to change display parameters and reset the drive if a fault occurs.
- 4 digit display with 10 additional LED indicators provides an intuitive display of drive status and information.
- 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 (SCM) provides connectivity to any controller with a DF1 port.
- The 10 most common application parameters are contained in the Basic Program Group. Common parameters shared with PowerFlex 40 drives are in the Advanced Program Group, and additional position control and fibers parameters located in the Enhanced Program Group.
- A NEMA Type 4X remote and NEMA Type 1 hand-held LCD keypad provide additional programming and control flexibility, both featuring the popular CopyCat function.



PowerFlex 40P PC Programming Software

By using an SCM and Connected Components Workbench software or DriveTools SP software, programming can be greatly simplified.

Connected Components Workbench Software

- Supports plug and play connectivity through a standard USB connection.
- AppView® tool provides parameter groups for several of the most common applications.
- Create and save custom parameter groups using the CustomView™ tool.
- Supports PowerFlex drives, Micro800™ controllers, and PanelView™ component graphic terminals.

DriveTools SP Software

- Online and offline programming capability
- In-grid and dialog-based parameter editing
- Immediate visual indication of drive and communication status when viewing online drive
- Integrated HTML Help architecture

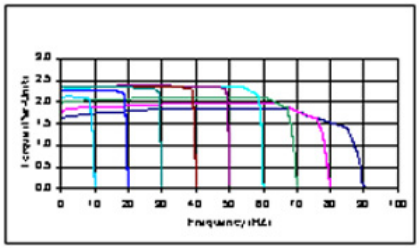
Optimized Performance

- Removable MOV to ground provides trouble-free operation when used on ungrounded distribution systems
- A relay pre-charge limits inrush current
- An integral brake transistor, available on all ratings, provides dynamic braking capability with simple low-cost brake resistors.
- DIP switch settable 24V DC sink or source control for control wiring flexibility
- 150% overload for 60 seconds or 200% overload for 3 seconds provides robust overload protection.
- Adjustable Pulse Width Modulated (PWM) frequency up to 16 kHz ensures quiet operation.



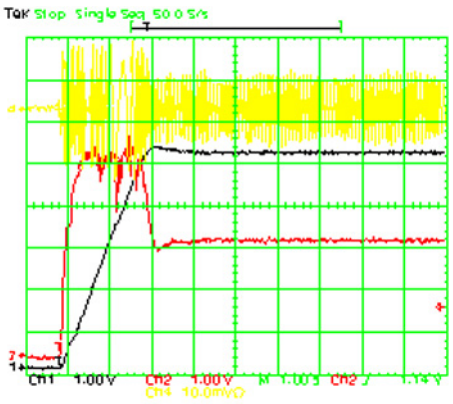
Sensorless Vector Control

- Sensorless vector control provides exceptional speed regulation and very high levels of torque across the entire speed range of the drive.
- The Autotune feature allows the PowerFlex 40P AC drive to adapt to individual motor characteristics.
- Closed loop with encoder feedback replaces slip compensation with trim for improved speed range and regulation.



Performance (Open Loop)

- This graph depicts the ability of a PowerFlex 40P drive to accelerate into at least 150% load.
- At 100% motor load, the drive runs the motor at synchronous speed.
- Excellent current regulation
- Linear acceleration
- Best in class digital input response time and repeatability

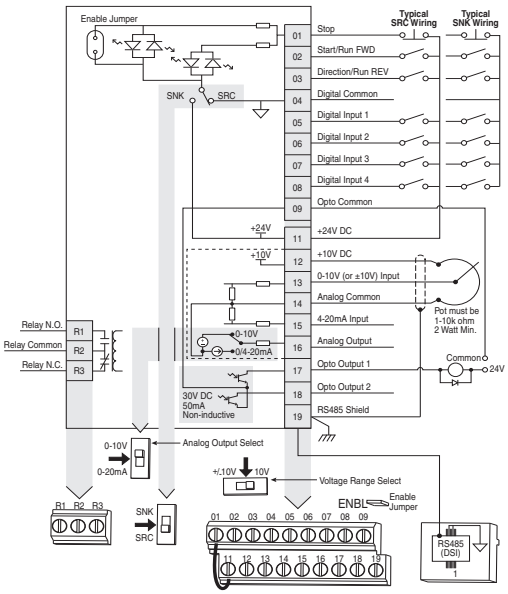


Control Performance



- V/Hz motor control
- Sensorless vector control with Autotune feature develops high torque over a wide speed range and adapts to individual motor characteristics.
  - Slip compensation or encoder trim
- Integral PID functionality enhances application flexibility.
- Position control regulator mode
- Timer, Counter, Basic Logic, and StepLogic functions can reduce hardware design costs and simplify control schemes.
  - **Timer function:** Relay or opto outputs are controlled by the drive performing the timer function. The timer is initiated by activating a digital input programmed as "Timer Start."
  - **Counter function:** Relay or opto outputs are controlled by the drive performing the counter function. The counter function is activated by a digital input programmed as "Counter Input."
  - **Basic Logic:** Relay or opto outputs are controlled by the status of digital inputs programmed as "Logic Inputs." Performs basic Boolean logic.
  - **Velocity and Position StepLogic**: Provides repeatable speed or position changes based on StepLogic application profile.

I/O



- Two semi-programmable digital inputs
  - Dedicated for start and stop
  - Simplifies wiring and troubleshooting
- Five fully programmable digital inputs provide application versatility
  - Standard 27 different settings, same as PowerFlex 40 AC drive providing application versatility
  - Additional 9 settings for Fibers and basic positioning enhancements
  - Reverse DI is now fully programmable via E202 [Digital Term 3]
- One programmable form C relay output and two opto outputs can be used to indicate various drive or motor conditions.
- One analog output is DIP Switch selectable for either voltage (0...10V) or current (0...20 mA). This scalable, 10-bit output is suitable for metering or as a speed reference for another drive.
- One analog input is DIP switch selectable for either voltage or current. Input is isolated from the rest of the drive I/O. Bipolar mode offers improved zero-cross performance.

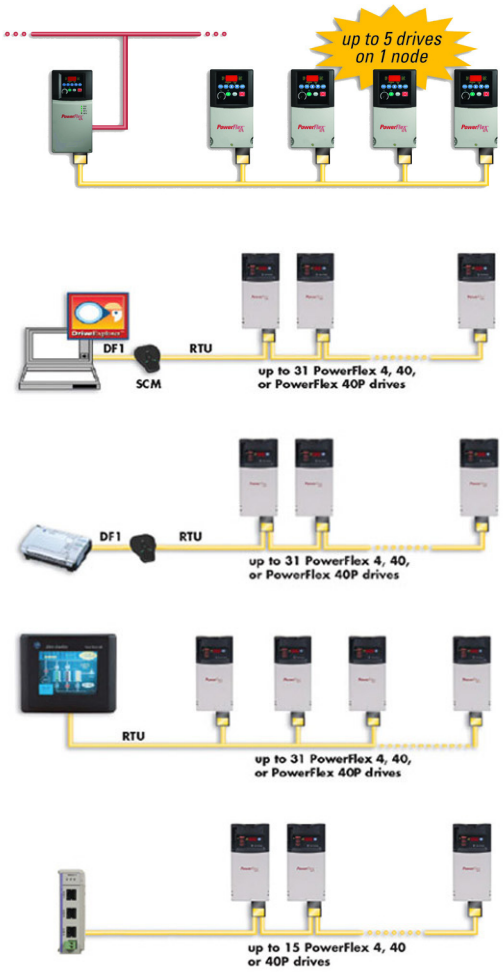
Communications



- Integral communication cards such as DeviceNet®, EtherNet/IP™, PROFIBUS DP, LonWorks, and ControlNet® can improve machine performance.
- The DSI wireless interface module (WIM) provides a wireless communication interface between a Pocket PC, laptop computer, or desktop computer equipped with Bluetooth wireless technology, and any Allen-Bradley® product supporting the DSI protocol.
- A field-installed option allows for future addition of stand-alone drives to a network.
- Online EDS file creation with RSNetWorx™ providing ease of set-up on a network.

Communication Options

- PowerFlex 40P AC drives are compatible with any device that acts as a RTU Master and supports standard 03, 06, and 16 RTU commands.
- Configure a network using PowerFlex 40P AC drives with optional communication cards for high performance and flexible configuration capabilities.
  - DeviceNet
  - EtherNet/IP
  - PROFIBUS DP
  - LonWorks
  - ControlNet
- A multi-drive solution can be reached using a single PowerFlex 40P AC drive DeviceNet option, with the ability for up to five drives to reside on one node.
- Integral RS-485 communications enable the drives to be used in a multi-drop network configuration. A serial converter module (SCM) provides connectivity to any controller with a DF1 port. The SCM can be eliminated if the controller acts as a RTU master.



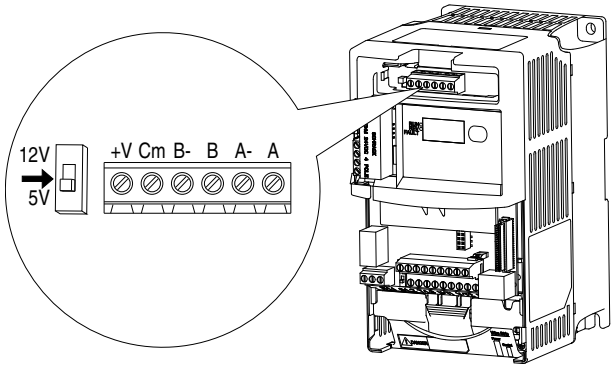
PowerFlex 40P AC Drive Advanced Features

Closed Loop

Encoder/Pulse Train Input Standard

The PowerFlex 40P AC drive allows for configurable closed loop control for either speed or position feedback for improved speed regulation, basic position control, or other pulse inputs for motor control.

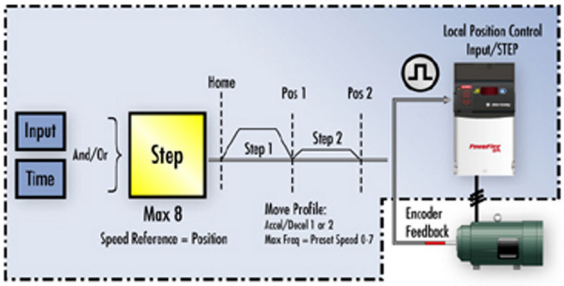
- Improved speed regulation
- Basic position control



Basic Position Control

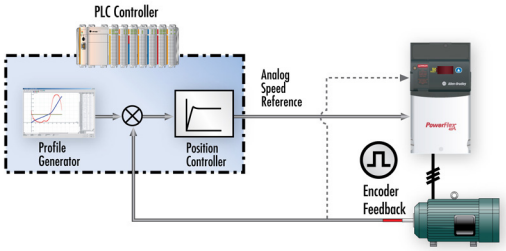
Local Position Control

- Position regulator with StepLogic
  - 8 positions (local logic)
  - Infinite if write to single step over multiple field bus networks (external logic)



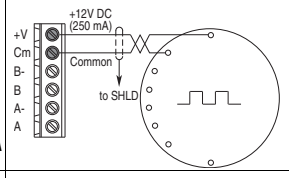
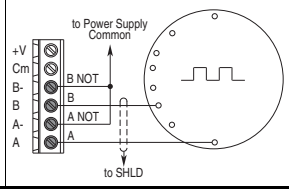
Outer Position Control Loop

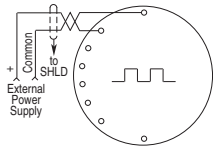
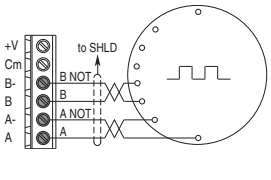
- Analog input bipolar mode offers improved zero-cross performance.
- Simple motion control applications with more complex position profiles
- Speed reference is supplied to drive via analog input or over multiple field bus network options.
- Speed ratio is available for simple draw applications.



Feedback Details

- Line driver type incremental encoder quadrature (dual channel) or single channel
  - 5/12V DC supply, 10 mA min per channel
  - Single-ended or differential (A, B channel)
  - Duty cycle of 50%, +10%
- Pulse train input
  - Configurable input voltage 5V/12V/24V DC autodetect
  - Frequency controlled PWM
- Allowable pulse frequency DC up to 250 kHz

I/O	Connection Example
Encoder Power – Internal Drive Power Internal (drive) 12V DC, 250 mA	
Encoder Signal – Single-ended, Dual Channel	

I/O	Connection Example
Encoder Power – External Power Source	
Encoder Signal – Differential, Dual Channel	

Improved Ride Through

Operation Down to 1/2 Line Voltage



The PowerFlex 40P AC drive allows for the selection of 1/2 DC bus operation, for use in critical applications where continued drive output is desired even in the event of brown out or low voltage conditions. The PowerFlex 40P AC drive also supports enhanced inertia ride-through for additional low voltage mitigation.

- Selectable 1/2 line voltage operation
- Increased power loss ride-through

Optimized for Common DC Bus Installations

Enhanced Control of Internal Pre-charge

Common DC bus offers additional inherent breaking capabilities by utilizing all the drives/loads on the bus for energy absorption offering higher efficiency and cost savings. The PowerFlex 40P AC drive has been optimized for use in common DC bus or shared DC bus installations.

- Configurable pre-charge control using digital inputs
- Direct DC Bus connection to power terminal blocks

Safety Inside using DriveGuard Safe-Torque-off Option

With the DriveGuard® option, the Safe-Torque-Off function (up to SIL 2/PL d) achieves both safety and productivity with zone control and cost savings through the reduction of components. The PowerFlex 40P AC drive with the Allen-Bradley DriveGuard relay board option is a certified safety solution for AC drive control per EN ISO 13849-1, EN 61800-5-2, EN 62061, and EN 61508.



DriveGuard®

Series B, 20-DG01

Application-specific Features

Beverage and Brewing Industry

- Embedded encoder in a compact and cost effective design
  - Reduction in dedicated sensors to track product position during production cycle
  - More process reliability and control, allowing for different process control "recipes" to be changed on the fly
  - Local logic capability with position/speed based on StepLogic
- Safety inside (Safe-Torque-Off functionality, up to SIL 2/PL d)
  - Zone control
  - Reduction in components/cost using DriveGuard safety relay option
- Applications:
  - Smart conveyors
  - Simple indexing (mixers and so on)
  - Palletizers

Fibers and Textiles Industry

- Fibers Firmware Features
  - Output frequency up to 500 Hz
  - Synchronized input ramps
  - Speed ratio over comms
  - Traverse and P-Jump
  - 4 Accel/Decel
- ½ DC bus operation and improved ride through
  - Continuous output under brown out conditions
  - Inherent breaking and ride through with the use of drives/loads in application
- Encoder/Pulse train input.
- Plate drive – 75% reduction in enclosed Watts
- Mount to an external heat sink
- Applications:
  - Drafting machines
  - Ring spinning machines
  - Roving machines
  - Carding machines
  - Draw/twist machines
  - Fiber winder control
  - Synthetic fiber spinning machines



Automotive Industry

- Embedded encoder in a compact and cost effective design
  - Sensorless vector with encoder feedback provides increased reliability
  - Position regulator: Reduction in sensors that are required to control process
  - Local logic (StepLogic) for time or digital input based positioning
- Safety inside (Safe-Torque-Off functionality, up to SIL 2/PL d)
  - Zone control
  - Reduced component count to achieve Category 3 / PL d according to EN ISO 13849-1 and SIL 2 according to EN 61800-5-2, EN 62061, and EN 61508.

- Applications:
  - Smart conveyors
  - Simple indexing applications
  - Variable frequency drive applications requiring Category 3 / PL d according to EN ISO 13849-1 and SIL 2 according to EN 61800-5-2, EN 62061, and EN 61508.

Material Handling

- Embedded encoder in a compact and cost effective design
  - Sensorless vector with encoder feedback provide increased reliability
  - Position regulator: Reduction in sensors required to control process
  - Local logic (StepLogic) for time or digital input based positioning
- Safety inside (Safe-Torque-Off functionality, up to SIL 2/PL d)
  - Zone control
  - Reduced component count to achieve Category 3 / PL d according to EN ISO 13849-1 and SIL 2 according to EN 61800-5-2, EN 62061, and EN 61508.
- Applications:
  - Palletizers
  - Packaging equipment
  - Smart conveyors



Catalog Number Explanation

Position	1-3	4	5	6-8	9	10	11	12	13-14
	22D	–	B	2P3	N	1	0	4	AA
	a		b	c	d	e	f	g	h

a

Drive	
Code	Type
22D	PowerFlex 40P

b

Voltage Rating		
Code	Voltage	Phase
B	240V AC	3
D	480V AC	3
E	600V AC	3

c1

Rating		
200…240V 3-phase Input		
Code	Amps	kW (HP)
2P3	2.3	0.4 (0.5)
5P0	5.0	0.75 (1.0)
8P0	8.0	1.5 (2.0)
012	12	2.2 (3.0)
017	17.5	3.7 (5.0)
024	24	5.5 (7.5)
033	33	7.5 (10)

c2

Rating		
380…480V 3-phase Input		
Code	Amps	kW (HP)
1P4	1.4	0.4 (0.5)
2P3	2.3	0.75 (1.0)
4P0	4.0	1.5 (2.0)
6P0	6.0	2.2 (3.0)
010	10.5	4.0 (5.0)
012	12	5.5 (7.5)
017	17	7.5 (10)
024	24	11 (15)

c3

Rating		
460…600V 3-phase Input		
Code	Amps	kW (HP)
1P7	1.7	0.75 (1.0)
3P0	3.0	1.5 (2.0)
4P2	4.2	2.2 (3.0)
6P6	6.6	4.0 (5.0)
9P9	9.9	5.5 (7.5)
012	12	7.5 (10)
019	19	11 (15)

d

Enclosure	
Code	Enclosure
N	Panel Mount - IP20 (NEMA Type Open)
F	Flange Mount - IP20 (NEMA Type Open)
H	Plate Drive - IP20 (NEMA Type Open)

e

HIM	
Code	HIM Version
1	Display/Fault Reset Only
2	Display/Fault Reset Only (Plate Drive)

f

Emission Class	
Code	EMC Filter
0	No Filter

g

Version	
Code	Version
4	Standard

h

Optional	
Code	Purpose
AA…ZZ	Reserved for custom firmware

PowerFlex 40P Standard Drives

240V AC, 3-phase Drives (50/60 Hz, No Filter)

Drive Ratings				Catalog Number		
kW	HP	Output Current (A)	Frame Size	IP20/NEMA Type Open	IP20 Plate Drive	IP20 Flange Mount(1)
0.4	0.5	2.3	B	22D-B2P3N104	22D-B2P3H204	22D-B2P3F104
0.75	1.0	5.0	B	22D-B5P0N104	22D-B5P0H204	22D-B5P0F104
1.5	2.0	9.0	B	22D-B8P0N104	22D-B8P0H204	22D-B8P0F104
2.2	3.0	12	B	22D-B012N104	22D-B012H204	22D-B012F104
3.7	5.0	17.5	B	22D-B017N104	22D-B017H204	22D-B017F104
5.5	7.5	24	C	22D-B024N104	22D-B024H204	22D-B024F104
7.5	10	33	C	22D-B033N104	22D-B033H204	22D-B033F104

(1) Meets IP 40/54/65 (NEMA 1/12/4/4X) when installed in an enclosure of like rating.

480V AC, 3-phase Drives (50/60 Hz, No Filter)

Drive Ratings				Catalog Number		
kW	HP	Output Current (A)	Frame Size	IP20/NEMA Type Open	IP20 Plate Drive	IP20 Flange Mount(1)
0.4	0.5	1.4	B	22D-D1P4N104	22D-D1P4H204	22D-D1P4F104
0.75	1.0	2.3	B	22D-D2P3N104	22D-D2P3H204	22D-D2P3F104
1.5	2.0	4.0	B	22D-D4P0N104	22D-D4P0H204	22D-D4P0F104
2.2	3.0	6.0	B	22D-D6P0N104	22D-D6P0H204	22D-D6P0F104
4.0	5.0	10.5	B	22D-D010N104	22D-D010H204	22D-D010F104
5.5	7.5	12	C	22D-D012N104	22D-D012H204	22D-D012F104
7.5	10	17	C	22D-D017N104	22D-D017H204	22D-D017F104
11	15	24	C	22D-D024N104	22D-D024H204	22D-D024F104

(1) Meets IP 40/54/65 (NEMA 1/12/4/4X) when installed in an enclosure of like rating.

600V AC, 3-phase Drives (50/60 Hz, No Filter)

Drive Ratings				Catalog Number		
kW	HP	Output Current (A)	Frame Size	IP20/NEMA Type Open	IP20 Plate Drive	IP20 Flange Mount(1)
0.75	1.0	1.7	B	22D-E1P7N104	22D-E1P7H204	22D-E1P7F104
1.5	2.0	3.0	B	22D-E3P0N104	22D-E3P0H204	22D-E3P0F104
2.2	3.0	4.2	B	22D-E4P2N104	22D-E4P2H204	22D-E4P2F104
4.0	5.0	6.6	B	22D-E6P6N104	22D-E6P6H204	22D-E6P6F104
5.5	7.5	9.9	c	22D-E9P9N104	22D-E9P9H204	22D-E9P9F104
7.5	10	12	C	22D-E012N104	22D-E012H204	22D-E012F104
11	15	19	C	22D-E019N104	22D-E019H204	22D-E019F104

(1) Meets IP40/IP54/IP65 (NEMA 1/12/4/4X) when installed in an enclosure of like rating.

User Installed Options

IP30/NEMA 1/UL Type 1 Conversion Kit

Item	Description	Drive Frame	Catalog Number
IP30/NEMA 1/UL Type 1 Kit	Field installed kit. Converts drive to IP30/NEMA 1/UL Type 1 enclosure. Includes conduit box with mounting screws and plastic top panel.	B	22-JBAB
		C	22-JBAC
IP30/NEMA 1/UL Type 1 Kit with Communication Option	Field installed kit. Converts drive to IP30/NEMA 1/UL Type 1 enclosure. Includes communication option conduit box with mounting screws and plastic top panel.	B	22-JBCB
		C	22-JBCC

Human Interface Module Option Kits and Accessories

Item	Description	Catalog Number
Remote HIM – Panel Mount	LCD display, remote panel mount, digital speed control, CopyCat capable, IP66 (NEMA Type 4X/12) indoor use only. Includes 2.0 m (6.6 ft) cable. The 22-HIM-C2S is smaller than the 22-HIM-C2 and cannot be used as a direct replacement.	22-HIM-C2S
Remote HIM – Handheld	LCD display, remote handheld, digital speed control, full numeric keypad, CopyCat capable, IP30 (NEMA Type 1). Includes 1.0 m (3.3 ft) cable, Panel mount with optional bezel kit	22-HIM-A3
Bezel Kit	Panel mount for LCD Display, Remote handheld unit, IP30 (NEMA Type 1). Includes a 22-RJ45CBL-C20 cable.	22-HIM-B1
DSI HIM Cable	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	Windows-based software packages for programming and configuring Allen-Bradley drives and other Rockwell Automation products. Compatibility: Microsoft Windows® Server 2012, Windows Server 2012 R2, Windows Server 2016, Windows Server 2019, Windows 10 IoT Enterprise 2016 LTSB 64-bit, Windows 10 IoT Enterprise 2019 LTSC, Windows 10, and Windows 11. All supported operating systems require .NET Framework 3.5 SPI to be installed. You can download Connected Components Workbench Standard Edition software for free at rok.auto/pcdc. To purchase Connected Components Workbench Developer Edition software, visit rok.auto/ccw.
DriveExecutive™ Software (Download as part of the DriveTools SP software package)	Windows-based software package that provides an intuitive means for monitoring or configuring Allen-Bradley drives and communications adapters online and offline. Compatibility: Microsoft Windows 7, Windows 10, and Windows Server 2019

Spare Parts

Item	Description	Catalog Number
Fan Replacement Kits	PowerFlex 40P Frame B, 1 fan	SK-U1-FAN1-B1
	PowerFlex 40P Frame B, 2 fans	SK-U1-FAN2-B1
	PowerFlex 40P Frame C, 1 fan	SK-U1-FAN1-C1
	PowerFlex 40P Frame C, 1 fan, 15 HP	SK-U1-FAN1-C2
Cover Replacement Kits	PowerFlex 40P Frame B with power terminal guard	SK-U1-DCVR3-B1
	PowerFlex 40P Frame C with power terminal guard	SK-U1-DCVR3-C1
	PowerFlex 40P Frame B and C encoder terminal cover	SK-U1-DCVR4-EN

Other Options

Item	Description	Catalog Number
DriveGuard Safe-Off Option (Series B)	Field installed kit. Used with suitable safety components to help provide protection against restart.	20A-DG01

Communication Option Kits

Item	Description	Catalog No.
Universal Serial Bus (USB) Converter Module	Provides serial communication via DF1 protocol for use with DriveTools SP software. Includes 2.0 m (6.6 ft) USB cable, 20-HIM-H10 cable, and 22-HIM-H10 cable.	1203-USB
DSI Cable	2.0 m (6.6 ft) RJ45 to RJ45 cable, male to male connectors	22-RJ45CBL-C20
Splitter Cable	RJ45 one port to two port splitter cable	AK-U0-RJ45-SC1
Splitter Cable	120 Ω resistor embedded in an RJ45 connector (2 pieces)	AK-U0-RJ45-TR1
Terminal Block	RJ45 2-position terminal block (5 pieces) with two 120 Ω terminating resistors (loose).	AK-U0-RJ45-TB2P
Communication Adapter	Embedded communication option for use with the PowerFlex family of drives. Requires a communication adapter cover when used with Frame B and C PowerFlex 40P drives (ordered separately) • ControlNet • DeviceNet • EtherNet/IP • LonWorks • PROFIBUS DP	22-COMM-C 22-COMM-D 22-COMM-E 22-COMM-L 22-COMM-P
External DSI Communications Kit	External mounting kit for 22-COMM adapters	20-XCOMM-DC-BASE

Communication Option Kits (Continued)

Item	Description	Catalog No.
External Comms Power Supply	Optional 100...240V AC powers supply for external DSI communications kit	20-XCOMM-AC-PS1
Compact I/O™ Module	Provides 3 channels that can be individually configured for Single, Multi-drive, and Modbus RTU modes.	1769-SM2
Communication Adapter Cover	Houses the communication adapter for Frame B and C drives. This cover adds 25 mm (0.98 in.) to the overall depth of the drive. • PowerFlex 40P Drive Frame B • PowerFlex 40P Drive Frame C	 22D-CCB(1) 22D-CCC(1)

(1) If NEMA 1/IP30 is required, you must also order the conversion kit:
- 22-JBCB (for Frame B drives)
- 22-JBCC (for Frame C drives)

Dynamic Brake Resistors

Drive Ratings			Minimum Resistance	Catalog Number(1)(2)	Fuse Protection(3)		
Input Voltage	kW	HP	Ohms		BR-	DC+/BR+	DC-
240V 50/60 Hz 3-phase	0.4	0.5	48	AK-R2-091P500	PV-12A10F	1000GH-016	1000GH-016
	0.75	1.0	48	AK-R2-091P500	PV-12A10F	1000GH-016	1000GH-016
	1.5	2.0	48	AK-R2-091P500	PV-12A10F	1000GH-025	1000GH-025
	2.2	3.0	32	AK-R2-047P500	PV-20A10F	1000GH-032	1000GH-032
	3.7	5.0	19	AK-R2-047P500	PV-30A10F	1000GH-040	1000GH-040
	5.5	7.5	13	AK-R2-030P1K2	PV-50A10F	1000GH-050	1000GH-050
	7.5	10	10	AK-R2-030P1K2	PV-63A10F	1000GH-063	1000GH-063
480V 50/60 Hz 3-phase	0.4	0.5	97	AK-R2-360P500	PV-12A10F	1000GH-016	1000GH-016
	0.75	1.0	97	AK-R2-360P500	PV-12A10F	1000GH-016	1000GH-016
	1.5	2.0	97	AK-R2-360P500	PV-12A10F	1000GH-016	1000GH-016
	2.2	3.0	97	AK-R2-120P1K2	PV-12A10F	1000GH-016	1000GH-016
	4.0	5.0	77	AK-R2-120P1K2	PV-15A10F	1000GH-032	1000GH-032
	5.5	7.5	55	AK-R2-120P1K2	PV-20A10F	1000GH-040	1000GH-040
	7.5	10	39	AK-R2-120P1K2	PV-30A10F	1000GH-040	1000GH-040
	11	15	24	AK-R2-120P1K2(4)	PV-50A10F	1000GH-050	1000GH-050
600V 50/60 Hz 3-phase	0.75	1.0	120	AK-R2-360P500	PV-10A10F	1000GH-016	1000GH-016
	1.5	2.0	120	AK-R2-360P500	PV-10A10F	1000GH-016	1000GH-016
	2.2	3.0	82	AK-R2-120P1K2	PV-15A10F	1000GH-016	1000GH-016
	4.0	5.0	82	AK-R2-120P1K2	PV-15A10F	1000GH-025	1000GH-025
	5.5	7.5	51	AK-R2-120P1K2	PV-20A10F	1000GH-025	1000GH-025
	7.5	10	51	AK-R2-120P1K2	PV-20A10F	1000GH-032	1000GH-032
	11	15	51	AK-R2-120P1K2(4)	PV-20A10F	1000GH-040	1000GH-040

(1) The resistors listed in this table are rated for 5% duty cycle.
(2) Use of Rockwell Automation resistors is always recommended. The resistors that are listed have been carefully selected to optimize performance in various applications. Alternative resistors can be used, however, care must be taken when making a selection. See the PowerFlex Dynamic Braking Resistor Calculator Application Technique, publication PFLEX-AT001.
(3) For IEC applications, DC Fuse is mandatory when these terminals are connected. Connect the fuse close to the terminal. Use the specified part number. PV-xxxxxx fuse is from Bussman. 1000GH-xxx fuse is from Hinode.
(4) Requires two resistors that are wired in parallel.

Input Line Reactors

240V, 50/60 Hz, 3-phase, 3% Impedance

kW	HP	Fundamental Amps	Maximum Continuous Amps	Inductance (mh)	Watts Loss (W)	Catalog Number
0.4	0.5	4.0	6.0	12	21	1321-3R4-B
0.75	1.0	8.0	12	3.0	29	1321-3R4-B
1.5	2.0	8.0	12	1.5	19.5	1321-3R8-B
2.2	3.0	12	18	1.25	26	1321-3R12-A
3.7	5.0	18	27	0.8	36	1321-3R18-A
5.5	7.5	25	37.5	0.5	48	1321-3R25-A
7.5	10	35	52.5	0.4	49	1321-3R35-A

480V, 50/60 Hz, 3-phase, 3% Impedance

kW	HP	Fundamental Amps	Maximum Continuous Amps	Inductance (mh)	Watts Loss (W)	Catalog Number
0.4	0.5	2.0	3.0	20	11.3	1321-3R2-B
0.75	1.0	4.0	6.0	9.0	20	1321-3R4-C
1.5	2.0	4.0	6.0	6.5	20	1321-3R4-B
2.2	3.0	8.0	12	5.0	25.3	1321-3R8-C
4.0	5.0	12	18	2.5	31	1321-3R8-B
5.5	7.5	12	18	2.5	31	1321-3R12-B
7.5	10	18	27	1.5	43	1321-3R18-B
11	15	25	37.5	1.2	52	1321-3R25-B

600V, 50/60 Hz, 3-phase, 3% Impedance

kW	HP	Fundamental Amps	Maximum Continuous Amps	Inductance (mh)	Watts Loss (W)	Catalog Number
0.75	1.0	2.0	3.0	20	11.3	1321-3R2-B
1.5	2.0	4.0	6.0	6.5	20	1321-3R4-C
2.2	3.0	4.0	6.0	6.5	20	1321-3R4-B
4.0	5.0	8.0	12	5.0	25.3	1321-3R8-C
5.5	7.5	12	18	2.5	31	1321-3R12-B
7.5	10	12	18	2.5	31	1321-3R12-B
11	15	18	27	1.5	43	1321-3R18-B

EMC Filters

Drive Ratings			Catalog Number	
Input Voltage	kW	HP	S Type Filter[1]	L Type Filter[2]
240V 50/60 Hz 3-phase	0.4	0.5	22-RF021-BS[3]	22-RF021-BL[3]
	0.75	1.0	22-RF021-BS[3]	22-RF021-BL[3]
	1.5	2.0	22-RF021-BS[3]	22-RF021-BL[3]
	2.2	3.0	22-RF021-BS[3]	22-RF021-BL[3]
	3.7	5.0	22-RF021-BS[3]	22-RF021-BL[3]
	5.5	7.5	22-RF034-CS	22-RF034-CL
	7.5	10	22-RF034-CS	22-RF034-CL

EMC Filters (Continued)

Drive Ratings			Catalog Number	
Input Voltage	**kW**	**HP**	**S Type Filter[1]**	**L Type Filter[2]**
480V 50/60 Hz 3-phase	0.4	0.5	22-RF012-BS	22-RF012-BL
	0.75	1.0	22-RF012-BS	22-RF012-BL
	1.5	2.0	22-RF012-BS	22-RF012-BL
	2.2	3.0	22-RF012-BS	22-RF012-BL
	4.0	5.0	22-RF012-BS	22-RF012-BL
	5.5	7.5	22-RF018-CS[3]	22-RF018-CL
	7.5	10	22-RF018-CS[3]	22-RF018-CL
	11	15	22-RF026-CS[3]	22-RF026-CL
600V 50/60 Hz 3-phase	0.75	1.0	–	22-RF8P0-BL
	1.5	2.0	–	22-RF8P0-BL
	2.2	3.0	–	22-RF8P0-BL
	4.0	5.0	–	22-RF8P0-BL
	5.5	7.5	–	22-RF015-CL
	7.5	10	–	22-RF015-CL
	11	15	–	22-RF024-CL

(1) This filter is suitable for use with a cable length of up to 10 m (32.8 ft) for Class A and 1 m (3.28 ft) for Class B environments.

(2) This filter is suitable for use with a cable length of up to 100 m (328 ft) for Class A and 5 m (16.4 ft) for Class B environments.

(3) Filter must be series C or later

Installation Considerations

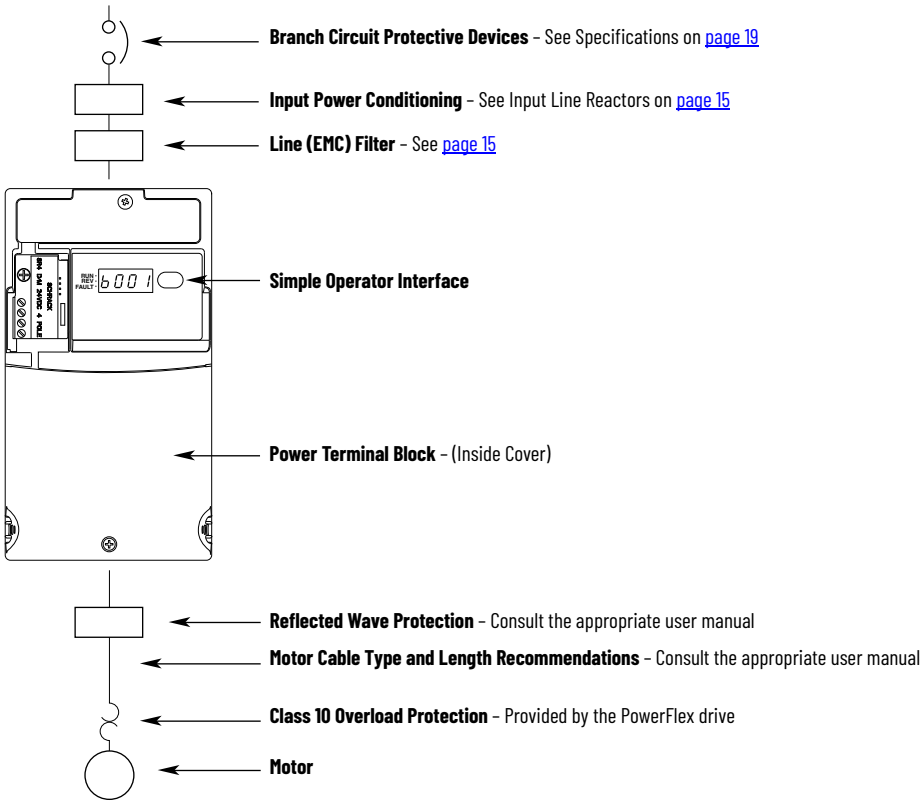
Power Wiring

PowerFlex 40P 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
- 6kV 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 40P Adjustable Frequency AC Drive User Manual, publication 22D-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

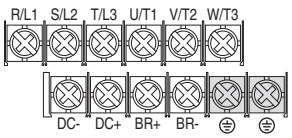
Terminal Block Specifications

Name	Frame	Description	Wire Size Range[1]		Recommended Torque
			Maximum	Minimum	
Power Terminal Block	B	All power terminals	5.3 mm^2 (10 AWG)	1.3 mm^2 (16 AWG)	1.7...2.2 N•m (16...19 lb•in)
	C	All power terminals	8.4 mm^2 (8 AWG)	1.3 mm^2 (16 AWG)	2.9...3.7 N•m (26...33 lb•in)

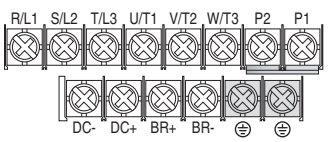
(1) Maximum/minimum sizes that the terminal block will accept - These are not recommendations.

Terminal[1]	Description
R/L1, S/L2	1-phase Input[2]
R/L1, S/L2, T/L3	3-phase Input
U/T1	To Motor U/T1
V/T2	To Motor V/T2 = Switch any two motor leads to change forward direction.
W/T3	To Motor W/T3
P2, P1	DC Bus Inductor Connection (C Frame drives only) The C Frame drive is shipped with a jumper between Terminals P2 and P1. Remove this jumper only when a DC Bus Inductor is connected. The drive does not power up without a jumper or inductor connected.
DC+, DC–	DC Bus Connection (Frame C Drives)
BR+, BR–	Dynamic Brake Resistor Connection
⏚	Safety Ground - PE

B Frame



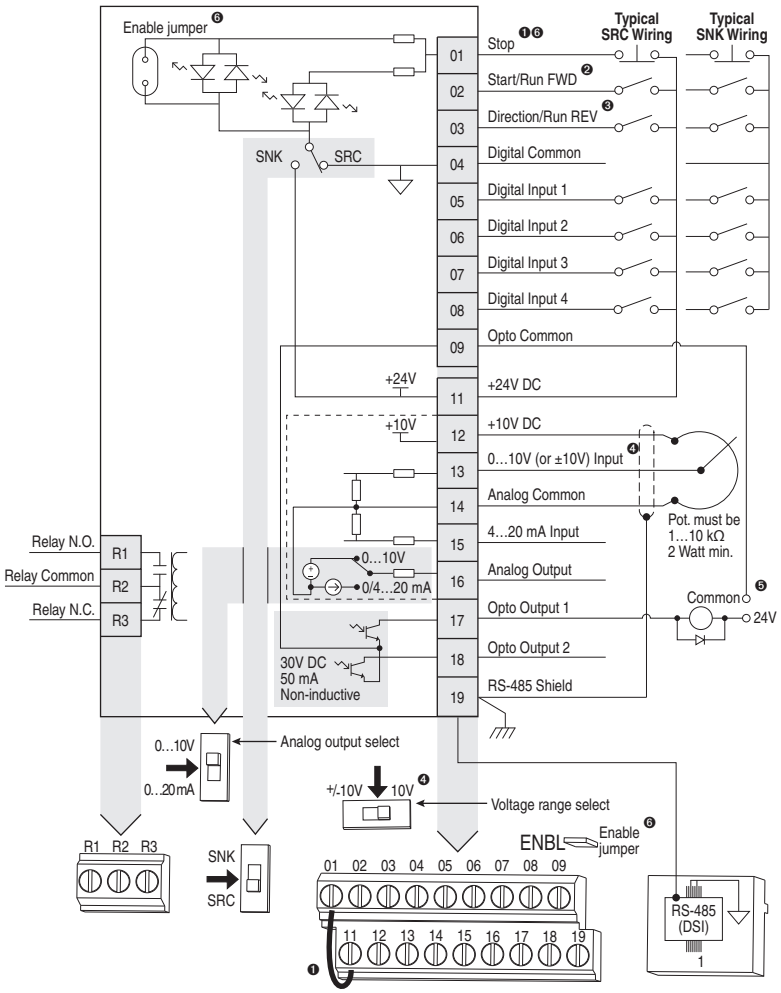
C Frame



(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.
(2) Single-phase operation requires a 65% derate of drive rated current.

Control Wiring

- The control logic is 24V DC and can be set for either Sink or Source control via a DIP switch setting.
- Control terminal screws are sized for a conventional blade screw driver.
- I/O Terminals 1 and 2 are semi-programmable and dedicated for Stop, Start, 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 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.



❶ **Important:** I/O Terminal 01 is always a coast to stop input except when P036 [Start Source] is set to "3-Wire", "2-W Lvl Sens" or "Momt FWD/REV" control. In three wire control, I/O Terminal 01 is controlled by P037 [Stop Mode]. All other stop sources are controlled by P037 [Stop Mode].

P036 [Start Source]	Stop	I/O Terminal 01 Stop
3-wire	Per P037	Per P037[5]
2-wire	Per P037	Coast
2-W Lvl Sens	Per P037	Per P037[5]
2-W Hi Speed	Per P037	Coast
RS-485 Port	Per P037	Coast
Momt FWD/REV	Per P037	Per P037[5]

Important: The drive is shipped with a jumper installed between I/O Terminals 01 and 11. Remove this jumper when using I/O Terminal 01 as a stop or enable input.

❷ Two wire control shown. For three wire control use a momentary input on I/O Terminal 02 to command a start. Use a maintained input for I/O Terminal 03 to change direction.

❸ The function of I/O Terminal 03 is fully programmable. Program with E202 [Digital Term 3].

❹ Match the Voltage Range Select DIP switch setting with the control scheme for proper unipolar or bipolar analog input operation.

❺ When using an opto output with an inductive load such as a relay, install a recovery diode parallel to the relay as shown, to prevent damage to the output.

❻ When the ENBL enable jumper is removed, I/O Terminal 01 will always act as a hardware enable, causing a coast to stop without software interpretation.

Control I/O Terminal Designations

No.	Signal	Default	Description
R1	Relay N.O.	Fault	Normally open contact for output relay
R2	Relay Common	–	Common for output relay
R3	Relay N.C.	Fault	Normally closed contact for output relay

Analog Output Select DIP Switch	0-10V	Sets analog output to either voltage or current. Setting must match A065 [Analog Out Sel].
Sink/Source DIP switch	Source (SRC)	Inputs can be wired as Sink (SNK) or Source (SRC) via DIP switch setting.

01	Stop[1]	Coast	The factory installed jumper or a normally closed input must be present for the drive to start.
02	Start/Run FWD	Not Active	I/O Terminal 03 is fully programmable. Program with E202 [Digital Term 3]. To disable reverse operation, see A095 [Reverse Disable].
03	Digital Term 3	Not Active	

Control I/O Terminal Designations (Continued)

No.	Signal	Default	Description
04	Digital Common	–	For digital inputs. Electronically isolated with digital inputs from analog I/O and opto outputs
05	Digital Input 1	Preset Freq	Program with A051 [Digital In1 Sel].
06	Digital Input 2	Preset Freq	Program with A052 [Digital In2 Sel].
07	Digital Input 3	Local	Program with A053 [Digital In3 Sel].
08	Digital Input 4	Jog Forward	Program with A054 [Digital In4 Sel].
09	Opto Common	–	For opto-coupled outputs. Electronically isolated with opto outputs from analog I/O and digital inputs
11	+24V DC	–	Referenced to Digital Common Drive-supplied power for digital inputs Maximum output current is 100 mA.
12	+10V DC	–	Referenced to Analog Common. Drive supplied power for 0...10V external potentiometer. Maximum output current is 15 mA.
13	±10V In[2]	Not Active	For external 0...10V (unipolar) or ±10V (bipolar) input supply (input impedance = 100 kΩ) or potentiometer wiper.
14	Analog Common	–	For 0...10V In or 4...20 mA In. Electronically isolated with analog inputs and outputs from digital I/O and opto outputs
15	4...20 mA In[2]	Not Active	For external 4...20 mA input supply (input impedance = 250 Ω)
16	Analog Output	OutFreq 0-10	The default analog output is 0...10V. To covert to a current value, change the Analog Output Select DIP Switch to 0...20 mA. Program with A065 [Analog Out Sel]. Max analog value can be scaled with A066 [Analog Out High]. Maximum Load: 4...20 mA = 525 Ω (10.5V) 0...10V = 1 kΩ (10mA)
17	Opto Output 1	MotorRunning	Program with A058 [Opto Out1 Sel]
18	Opto Output 2	At Frequency	Program with A061 [Opto Out2 Sel]
19	RS-485 (DSI) Shield	–	Terminal should be connected to safety ground - PE when using the RS-485 (DSI) communications port.

(1) See notes ❶ and ❻ on page 18.

(2) 0...10V In and 4...20 mA In are distinct input channels and may be connected simultaneously. Inputs may be used independently for speed control or jointly in PID mode.

Specifications

Drive Ratings — PowerFlex 40P

Catalog Number[1]	Output Ratings		Input Ratings			Branch Circuit Protection				Estimated Power Dissipation
	kW (HP)	Amps	Voltage Range	kVA	Amps	Fuses[2]	140M Motor Protectors[3][4]	Contactors	Min. Enclosure Volume[5] (in.^{3})	IP20 Open Watts
200...240V AC — 3-phase Input, 0...230V 3-phase Output										
22D-B2P3x104	0.4 (0.5)	2.3	180-264	1.15	2.5	6	140M-C2E-B40	100-C09 100-E09	1655	40
22D-B5P0x104	0.75 (1.0)	5.0	180-264	2.45	5.7	10	140M-C2E-C10	100-C09 100-E09	1655	60
22D-B8P0x104	1.5 (2.0)	8.0	180-264	4.0	9.5	15	140M-C2E-C16	100-C12 100-E12	1655	85
22D-B012x104	2.2 (3.0)	12.0	180-264	5.5	15.5	25	140M-C2E-C16	100-C23 100-E26	1655	125
22D-B017x104	3.7 (5.0)	17.5	180-264	8.6	21.0	30	140M-F8E-C25	100-C23 100-E26	1655	180
22D-B024x104	5.5 (7.5)	24.0	180-264	11.8	26.1	40	140M-F8E-C32	100-C37 100-E38	2069	235
22D-B033x104	7.5 (10)	33.0	180-264	16.3	34.6	60	140M-F8E-C45	100-C60 100-E65	2069	305
380...480V AC — 3-phase Input, 0...460V 3-phase Output										
22D-D1P4x104	0.4 (0.5)	1.4	342-528	1.4	1.8	3	140M-C2E-B25	100-C09 100-E09	1655	35
22D-D2P3x104	0.75 (1.0)	2.3	342-528	2.3	3.2	6	140M-C2E-B40	100-C09 100-E09	1655	50
22D-D4P0x104	1.5 (2.0)	4.0	342-528	4.0	5.7	10	140M-C2E-B63	100-C09 100-E09	1655	70
22D-D6P0x104	2.2 (3.0)	6.0	342-528	5.9	7.5	15	140M-C2E-C10	100-C09 100-E09	1655	100

Drive Ratings — PowerFlex 40P (Continued)

Catalog Number[1]	Output Ratings		Input Ratings			Branch Circuit Protection				Estimated Power Dissipation
	kW (HP)	Amps	Voltage Range	kVA	Amps	Fuses[2]	140M Motor Protectors[3][4]	Contactors	Min. Enclosure Volume[5] (in.^{3})	IP20 Open Watts
22D-D010x104	4.0 (5.0)	10.5	342-528	10.3	13.0	20	140M-C2E-C16	100-C23 100-E26	1655	160
22D-D012x104	5.5 (7.5)	12.0	342-528	11.8	14.2	25	140M-D8E-C20	100-C23 100-E26	2069	175
22D-D017x104	7.5 (10)	17.0	342-528	16.8	18.4	30	140M-D8E-C20	100-C23 100-E26	2069	210
22D-D024x104	11 (15)	24.0	342-528	23.4	26.0	50	140M-F8E-C32	100-C43 100-E40	2069	300
460...600V AC — 3-phase Input, 0...575V 3-phase Output										
22D-E1P7x104	0.75 (1.0)	1.7	414-660	2.1	2.3	6	140M-C2E-B25	100-C09 100-E09	1655	50
22D-E3P0x104	1.5 (2.0)	3.0	414-660	3.65	3.8	6	140M-C2E-B40	100-C09 100-E09	1655	70
22D-E4P2x104	2.2 (3.0)	4.2	414-660	5.2	5.3	10	140M-D8E-B63	100-C09 100-E09	1655	100
22D-E6P6x104	4.0 (5.0)	6.6	414-660	8.1	8.3	15	140M-D8E-C10	100-C09 100-E09	1655	160
22D-E9P9x104	5.5 (7.5)	9.9	414-660	12.1	11.2	20	140M-D8E-C16	100-C16 100-E16	2069	175
22D-E012x104	7.5 (10)	12.2	414-660	14.9	13.7	25	140M-D8E-C16	100-C23 100-E26	2069	210
22D-E019x104	11 (15)	19.0	414-660	23.1	24.1	40	140M-F8E-C25	100-C30 100-E30	2069	300

(1) Ratings apply to all drive types; Panel Mount (N104), Flange Mount (F104), and Plate Drive (H204).
(2) Recommended Fuse Type: UL Class J, CC, T, or Type BS88; 600V (550V) or equivalent
(3) The AIC ratings of the Bulletin 140M devices can vary. See Motor Protection Circuit Breaker and Motor Circuit Protector Specifications Technical Data, publication 140M-TD002.
(4) 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.
(5) 200...240V AC — 1-phase drives are also available with an integral EMC filter. Catalog suffix changes from N104 to N114 or N103 to N113.

Certifications

Category	Specification	
Agency Certification	c UL us	Listed to UL 508C and CSA C22.2 No. 14 Listed to UL 508C for plenums
		Radiocommunications Act:1992 (including Amendments up to 2018) Radiocommunications (Electromagnetic Compatibility) Standard 2017 Radiocommunications Labeling (Electromagnetic Compatibility) Notice 2017
	CE	Marked for all applicable European Directives EMC Directive: 2014-30/EU: EN 61800-3 LVD Directive: 2014/35/EU: EN 61800-5-1 EN 61800-5-1
	UKCA	EMC Regulations: 2016 No. 1091: EN 61800-3 LV Regulations: 2016 No. 1101: EN 61800-5-1
		LC-REM-RAA-22C
	TÜV Rheinland FS	EN ISO 13849-1, Category 3 / Performance Level d EN 61800-5-2, SIL 2 EN 62061, SIL 2 EN 61508, SIL 2 Meets Functional Safety (FS) when used with the DriveGuard Safe-Off Option (Series B).
	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.	

Technical Specifications

Category	Specification	
Protection	Bus Overvoltage Trip 200...240V AC Input 380...460V AC Input 460...600V AC Input	 405V DC bus (equivalent to 290V AC incoming line) 810V DC bus (equivalent to 575V AC incoming line) 1005V DC bus (equivalent to 711V AC incoming line)
	Bus Undervoltage Trip 200...240V AC Input 380...480V AC Input 460...600V AC Inpu P042 = 3 "High Voltage" P042 = 2 "Low Voltage"	 210V DC bus (equivalent to 150V AC incoming line) 390V DC bus (equivalent to 275V AC incoming line) 487V DC bus (equivalent to 344V AC incoming line) 390V DC bus (equivalent to 275V AC incoming line)
	Power Ride-through	100 ms
	Logic Control Ride-through	0.5 s minimum, 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).
	Maximum Surrounding Air Temperature without derating IP20, Open Type IP30, NEMA Type 1, UL Type 1 Flange and Plate Mount	 –10...+50 °C (14...122 °F) –10...+40 °C (14...104 °F) Heatsink: –10...+40 °C (14...104 °F) Drive: –10...+50 °C (14...122 °F)
	Cooling Method Convection Fan	 0.4 kW (0.5 HP) drives and all Flange and Plate drives All other 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% non-condensing
	Shock (operating)	15G peak for 11 ms duration (±1.0 ms)
	Vibration (operating)	1 g peak, 5...2000 Hz
Electrical	Voltage Tolerance	200...240V ±10% 380...480V ±10% 460...600V ±10%
	Frequency Tolerance	48...63 Hz
	Displacement Power Factor	0.98 across entire speed range
	Maximum Short Circuit Rating	100,000 Amps Symmetrical
	Actual Short Circuit Rating	Determined by AIC Rating of installed fuse/circuit breaker
	Transistor Type	Isolated Gate Bipolar (IGBT)

Technical Specifications (Continued)

Category	Specification		
Control	Method		Sinusoidal PWM, Volts/Hertz, and Sensorless Vector
	Carrier Frequency		2...16 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 maximum output frequency, 10-bit resolution ±2% of full scale, 10-bit resolution
	Speed Regulation Open Loop with Slip Compensation With Encoder		 ±1% of base speed across a 80:1 speed range ±0.3% of base speed across a 80:1 speed range ±0.05% of base speed across a 20:1 speed range
	Output Frequency		0...500 Hz (programmable)
	Efficiency		97.5% (typical)
	Stop Modes		Multiple programmable stop modes including - Ramp, Coast, DC-Brake, and Ramp-to-Stop
	Accel/Decel		Four independently programmable accel and decel times. Each time may be programmed from 0...600 seconds in 0.1 second increments.
	Intermittent Overload		150% Overload capability for up to 1 minute 200% Overload capability for up to 3 seconds
	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	Bandwidth	10 Rad/Secs for open and closed loop
		Quantity	(2) Dedicated for start and stop (5) Programmable for functions such as preset speeds, jog, and so on.
		Current	6 mA
		Type Source Mode (SRC) Sink Mode (SNK)	 18...24V = ON, 0...6V = Off 0...6V = ON, 18...24V = Off
	Analog	Quantity	(2) Isolated, -10...+10V and 4...20 mA
		Specification Resolution 0...10V DC Analog 4...20 mA Analog External Pot	 10-bit 100 kΩ input impedance 250 Ω input impedance 1...10 kΩ, 2 Watt minimum
Encoder	Type		Incremental, dual channel
	Supply		12V, 250 mA. 12V, 10 mA minimum inputs isolated with differential transmitter, 250 kHz max.
	Quadrature		90°, ±27° at 25 °C (77 °F)
	Duty Cycle		50%, +10%
	Requirements		Encoders must be line driver type, quadrature (dual channel) or pulse (single channel), 3.5...26V DC output, single-ended or differential and capable of supplying a minimum of 10 mA per channel. Maximum input frequency is 250 kHz. The encoder I/O automatically scales to allow 5V, 12V, and 24V DC nominal voltages.
Control Outputs	Relay	Quantity	(1) Programmable Form C
		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	(2) Programmable
		Specification	30V DC, 50 mA Non-inductive
	Analog	Quantity	(1) Non-isolated 0...10V or 4...20 mA
		Specification Resolution 0...10V DC Analog 4...20 mA Analog	 10-bit 1 kΩ min 525 Ω max

Parameter List

Parameter Number	Parameter Name	Description	Factory Default
Basic Display Group			
b001	Output Freq	Output frequency present at T1, T2, and T3 (U, V, and W)	Read-only
b002	Commanded Freq	Value of the active frequency command	Read-only
b003	Output Current	Output current present at T1, T2, and T3 (U, V, and W)	Read-only
b004	Output Voltage	Output voltage present at T1, T2, and T3 (U, V, and 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	Fault 2 Code		
b009	Fault 3 Code		
b010	Process Display	Output frequency scaled by A099 [Process Factor]	Read-only
b012	Control Source	Displays the active source of the Start Command and Speed Command	Read-only
b013	Contrl In Status	Status of the control terminal block control inputs	Read-only
b014	Dig In Status	Status of the control terminal block digital inputs	Read-only
b015	Comm Status	Status of the communication ports	Read-only
b016	Control SW Ver	Main Control Board software version	Read-only
b017	Drive Type	Used by Rockwell Automation field service personnel	Read-only
b018	Elapsed Run Time	Accumulated time drive is outputting power	Read-only
b019	Testpoint Data	Present value of the function selected in A102 [Testpoint Sel]	Read-only
b020	Analog In 0-10V	Present value of the voltage at I/O Terminal 13	Read-only
b021	Analog In 4-20mA	Present value of the current at I/O Terminal 15	Read-only
b022	Output Power	Output power present at T1, T2, and T3 (U, V, and W)	Read-only
b023	Output Powr Fctr	The angle in electrical degrees between motor voltage and motor current	Read-only
b024	Drive Temp	Present operating temperature of the drive power section	Read-only
b025	Counter Status	The current value of the counter when counter is enabled	Read-only
b026	Timer Status	The current value of the timer when timer is enabled	Read-only
b028	Stp Logic Status	The current step of the StepLogic profile	Read-only
b029	Torque Current	The current value of the motor torque current	Read-only
Basic Program Group			
P031	Motor NP Volts	20 to Drive Rated Volts	Based on drive rating
P032	Motor NP Hertz	15...500 Hz	60 Hz
P033	Motor OL Current	0.0 to (Drive Rated Amps x 2)	Based on drive rating
P034	Minimum Freq	0.00...500.0 Hz	0.00 Hz
P035	Maximum Freq	0.00...500.0 Hz	60.00 Hz
P036	Start Source	6 settings; 3-wire, 2-wire, 2-W Lvl Sens, 2-W Hi Speed, Comm Port, Momt FWD/REV	Comm Port
P037	Stop Mode	10 settings: Ramp, CF; Coast, CF; DC Brake, CF; DCBrkAuto,CF; Ramp; Coast; DC Brake; DC BrakeAuto; Ramp+EM B,CF; Ramp+EM Brk	Ramp, CF (Clear Fault)
P038	Speed Reference	9 settings; InternalFreq, 0...10V Input, 4...20 mA Input, Preset Freq, Comm Port, Stp Logic, Anlg In Mult, Encoder, Positioning	Comm Port
P039	Accel Time 1	0.0...600.0 s	10.0 s
P040	Decel Time 1	0.0...600.0 s	10.0 s
P041	Reset To Defalts	Used to reset drive to factory default settings	Ready/Idle
P042	Voltage Class	Sets the voltage class of 600V drives	High Voltage
P043	Motor OL Ret	Enables/disables the Motor Overload Retention function	Disabled
Advanced Program Group			
A051	Digital In1 Sel	36 settings: Not Used; Acc/Dec Sel1; Jog; Aux Fault; Preset Freq; Comm Port; Clear Fault; RampStop,CF; CoastStop,CF; DCInjStop,CF; Jog Forward; Jog Reverse; 10V In Ctrl; 20 mA In Ctrl; PID Disable; MOP Up; MOP Down; Timer Start; Counter In; Reset Timer; Reset Countr; Rset Tim&Cnt; Logic In1; Logic In2; Current Lmt2; Anlg Invert; EM Brk Rlse; Acc/Dec Sel2; Precharge En; Inertia Dcel; Sync Enable; Traverse Dis; Home Limit; Find Home; Hold Step; Pos Redefine	Preset Freq
A052	Digital In2 Sel		Preset Freq
A053	Digital In3 Sel		Local
A054	Digital In4 Sel		Jog Forward

Parameter List (Continued)

Parameter Number	Parameter Name	Description	Factory Default
Advanced Program Group (Continued)			
A055	Relay Out Sel	26 settings; Ready/Fault, At Frequency, MotorRunning, Reverse, Motor OverId, Ramp Reg, Above Freq, Above Cur, Above DCVolt, Retries Exst, Above Anlg V, Logic In 1, Logic In 2, Logic 1 and 2, Logic 1 or 2, StpLogic Out, Timer Out, Counter Out, Above PF Ang, Anlg In Loss, ParamControl, NonRec Fault, EM Brk Cntrl, At Position, At Home, Safe-Off	Ready/Fault
A056	Relay Out Level	0.0…9999	0.0
A058	Opto Out1 Sel	26 settings; Ready/Fault, At Frequency, MotorRunning, Reverse, Motor OverId, Ramp Reg, Above Freq, Above Cur, Above DCVolt, Retries Exst, Above Anlg V, Logic In 1, Logic In 2, Logic 1 and 2, Logic 1 or 2, StpLogic Out, Timer Out, Counter Out, Above PF Ang, Anlg In Loss, ParamControl, NonRec Fault, EM Brk Cntrl, At Position, At Home, Safe-Off	MotorRunning
A059	Opto Out1 Level	0.0…9999	0.0
A061	Opto Out2 Sel	26 settings; Ready/Fault, At Frequency, MotorRunning, Reverse, Motor OverId, Ramp Reg, Above Freq, Above Cur, Above DCVolt, Retries Exst, Above Anlg V, Logic In 1, Logic In 2, Logic 1 and 2, Logic 1 or 2, StpLogic Out, Timer Out, Counter Out, Above PF Ang, Anlg In Loss, ParamControl, NonRec Fault, EM Brk Cntrl, At Position, At Home, Safe-Off	At Frequency
A062	Opto Out2 Level	0.0…9999	0.0
A064	Opto Out Logic	0…3	0
A065	Analog Out Sel	21 settings; OutFreq 0…10, OutCurr 0…10, OutVolt 0…10, OutPowr 0…10, TstData 0…10, OutFreq 0…20, OutCurr 0…20, OutVolt 0…20, OutPowr 0…20, TstData 0…20, OutFreq 4…20, OutCurr 4…20, OutVolt 4…20, OutPowr 4…20, TstData 4…20, OutTorq 0…10, OutTorq 0…20, OutTorq 4…20, Setpnt 0…10, Setpnt 0…20, Setpnt 4…20	OutFreq 0…10
A066	Analog Out High	0…800%	100%
A067	Accel Time 2	0.0…600.0 s	20.0 s
A068	Decel Time 2	0.0…600.0 s	20.0 s
A069	Internal Freq	0.00…600.0 Hz	60.00 Hz
A070	Preset Freq 0	0.00…500.0 Hz	0.00 Hz
A071	Preset Freq 1		5.00 Hz
A072	Preset Freq 2		10.00 Hz
A073	Preset Freq 3		20.00 Hz
A074	Preset Freq 4		30.00 Hz
A075	Preset Freq 5		40.00 Hz
A076	Preset Freq 6		50.00 Hz
A077	Preset Freq 7		60.00 Hz
A078	Jog Frequency	0.00…[Maximum Freq]	10.00 Hz
A079	Jog Accel/Decel	0.1…600.0 s	10.0 s
A080	DC Brake Time	0.0…99.9 s	0.0 s
A081	DC Brake Level	0.0 …(Drive Rated Amps x 1.8)	Drive Rated Amps x 0.05
A082	DB Resistor Sel	0…99	0
A083	S Curve %	0…100%	0%
A084	Boost Select	15 settings: Custom V/Hz; 30.0, VT (Variable Torque); 35.0, VT; 40.0, VT; 45.0, VT; 0.0 no IR; 0.0; 2.5, CT (Constant Torque); 5.0, CT; 7.5, CT; 10.0, CT; 12.5, CT; 15.0, CT;17.5, CT; 20.0, CT	5.0, CT 2.5, CT: 5, 7.5, 10 and 15 Hp
A085	Start Boost	0.0…25.0%	2.5%
A086	Break Voltage	0.0…100.0%	25.0%
A087	Break Frequency	0.0…500.0 Hz	15.0 Hz
A088	Maximum Voltage	20 to Drive Rated Volts	Drive Rated Volts
A089	Current Limit 1	0.1 to (Drive Rated Amps x 1.8)	Drive Rated Amps x 1.5
A090	Motor OL Select	3 settings; No Derate, Min Derate, Max Derate	No Derate
A091	PWM Frequency	2.0…16.0 kHz	4.0 kHz
A092	Auto Rstrt Tries	0…9	0
A093	Auto Rstrt Delay	0.0…120.0s	1.0 Secs
A094	Start At PowerUp	2 settings; Disabled, Enabled	Disabled
A095	Reverse Disable	2 settings; Rev Enabled, Rev Disabled	Rev Enabled
A096	Flying Start En	2 settings; Disabled, Enabled	Disabled
A097	Compensation	4 settings; Disabled, Electrical, Mechanical, Both	Electrical
A098	SW Current Trip	0.0…(Drive Rated Amps x 2)	0.0 (Disabled)

Parameter List (Continued)

Parameter Number	Parameter Name	Description	Factory Default
Advanced Program Group (Continued)			
A099	Process Factor	0.1...999.9	30.0
A100	Fault Clear	3 settings; Ready/Idle, Reset Fault, Clear Buffer	Ready/Idle
A101	Program Lock	2 settings; Unlocked, Locked	Unlocked
A102	Testpoint Sel	400...FFFF Hex	400
A103	Comm Data Rate	6 settings; 1200, 2400, 4800, 9600, 19.2K, 38.4K	9600
A104	Comm Node Addr	1...247	100
A105	Comm Loss Action	4 settings; Fault, Coast Stop, Stop, Continu Last	Fault
A106	Comm Loss Time	0.1...60.0 s	5.0 s
A107	Comm Format	6 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	RTU 8-N-1
A108	Language	7 settings; English, Francais, Espanol, Italiano, Deutsch, Portugues, Nederlands	English
A109	Anlg Out Setpt	0.0...100.0%	0.0%
A110	Anlg In 0-10V Lo	0.0...100.0%	0.0%
A111	Anlg In 0-10V Hi	0.0...100.0%	100.0%
A112	Anlg In4-20mA Lo	0.0...100.0%	0.0%
A113	Anlg In4-20mA Hi	0.0...100.0%	100.0%
A114	Slip Hertz @ FLA	0.0...10.0 Hz	2.0 Hz
A115	Process Time Lo	0.00...99.99	0.00
A116	Process Time Hi	0.00...99.99	0.00
A117	Bus Reg Mode	2 settings; Disabled, Enabled	Enabled
A118	Current Limit 2	0.1...(Drive Rated Amps x 1.8)	Drive Rated Amps x 1.5
A119	Skip Frequency	0...500 Hz	0 Hz
A120	Skip Freq Band	0.0...30.0 Hz	0.0 Hz
A121	Stall Fault Time	6 settings; 60 Seconds, 120 Seconds, 240 Seconds, 360 Seconds, 480 Seconds, Flt Disabled	60 Seconds
A122	Analog In Loss	7 settings; Disabled, Fault, Stop, Zero Ref, Min Freq Ref, Max Freq Ref, Int Freq Ref	Disabled
A123	10V Bipolar Enbl	2 settings; Uni-Polar In, Bi-Polar In	Uni-Polar In
A124	Var PWM Disable	2 settings; Enable, Disable	Enable
A125	Torque Perf Mode	2 settings; V/Hz, Sensrls Vect	Sensrls Vect
A126	Motor NP FLA	0.1 to (Drive Rated Amps x 2)	Drive Rated Amps
A127	Autotune	3 settings; Ready/Idle, Static Tune, Rotate Tune	Ready/Idle
A128	IR Voltage Drop	0.0...230.0 VAC	Based on Drive Rating
A129	Flux Current Ref	0.00...[Motor NP FLA]	Based on Drive Rating
A130	PID Trim Hi	0.0...500.0 Hz	60.0 Hz
A131	PID Trim Lo	0.0...500.0 Hz	0.0 Hz
A132	PID Ref Sel	11 settings: PID Disabled; PID Setpoint; 0...10V Input; 4...20 mA Input; Comm Port; Encoder; Setpnt, Trim; 0...10V, Trim; 4-20mA, Trim; Comm, Trim; Encoder,Trim	PID Disabled
A133	PID Feedback Sel	4 settings; 0...10V Input, 4...20 mA Input, Comm Port, Encoder	0...10V Input
A134	PID Prop Gain	0.00...99.99	0.01
A135	PID Integ Time	0.0...999.9 s	2.0 s
A136	PID Diff Rate	0.00...99.99 (1/s)	0.01 (1/s)
A137	PID Setpoint	0.0...100.0%	0.0%
A138	PID Deadband	0.0...10.0%	0.0%
A139	PID Preload	0.0...500.0 Hz	0.0 Hz
A140	Stp Logic 0	0001...FAFF	00F1
A141	Stp Logic 1		
A142	Stp Logic 2		
A143	Stp Logic 3		
A144	Stp Logic 4		
A145	Stp Logic 5		
A146	Stp Logic 6		
A147	Stp Logic 7		

Parameter List (Continued)

Parameter Number	Parameter Name	Description	Factory Default
Advanced Program Group (Continued)			
A150	Stp Logic Time 0	0.0...999.9 s	30.0 s
A151	Stp Logic Time 1		
A152	Stp Logic Time 2		
A153	Stp Logic Time 3		
A154	Stp Logic Time 4		
A155	Stp Logic Time 5		
A156	Stp Logic Time 6		
A157	Stp Logic Time 7		
A160	EM Brk Off Delay	0.01...10.00 s	2.00 s
A161	EM Brk On Delay	0.01...10.00 s	2.00 s
A162	MOP Reset Sel	2 settings; Zero MOP Ref, Save MOP Ref	Save MOP Ref
A163	DB Threshold	0.0...110.0%	100.0%
Enhanced Program Group			
E201	LED Display Opt	0...3	2
E202	Digital Term 3	36 settings: Start Source; Acc/Dec Sel1; Jog; Aux Fault; Preset Freq; Comm Port; Clear Fault; RampStop,CF; CoastStop,CF; DCInjStop,CF; Jog Forward; Jog Reverse; 10V In Ctrl; 20 mA In Ctrl; PID Disable; MOP Up; MOP Down; Timer Start; Counter In; Reset Timer; Reset Countr; Rset Tim&Cnt; Logic In1; Logic In2; Current Lmt2; Anlg Invert; EM Brk Rlse; Acc/Dec Sel2; Precharge En; Inertia Dcel; Sync Enable; Traverse Dis; Home Limit; Find Home; Hold Step; Pos Redefine	Term Block
E203	Accel Time 3	0.0...600.0 s	5.0 s
E204	Decel Time 3	0.0...600.0 s	5.0 s
E205	Accel Time 4	0.0...600.0 s	30.0 s
E206	Decel Time 4	0.0...600.0 s	30.0 s
E207	Comm Write Mode	2 settings; EEPROM, RAM only	EEPROM
E208	Power Loss Mode	2 settings; Coast, Decel	Coast
E209	Half Bus Enable	2 settings; Disabled, Enabled	Disabled
E210	Max Traverse	0.00...300.0 Hz	0.00 Hz (Disabled)
E211	Traverse Inc	0.00...30.00 Secs	0.00 Secs
E212	Traverse Dec	0.00...30.00 Secs	0.00 Secs
E213	P Jump	0.00...300.0 Hz	0.00 Hz
E214	Sync Time	0.0...3200.0 Secs	0.0 s (Disabled)
E215	Speed Ratio	0.01...99.99	1.00
E216	Motor Fdbk Type	6 settings; None, Pulse Train, Single Chan, Single Check, Quadrature, Quad Check	None
E217	Motor NP Poles	2...40	4
E218	Encoder PPR	1...20000	1024
E219	Pulse In Scale	1...20000	64
E220	Ki Speed Loop	0.0...400.0	2.0
E221	Kp Speed Loop	0.0...200.0	0.5
E222	Positioning Mode	0...4	0
E223	Find Home Freq	0.1...500.0 Hz	10.0 Hz
E224	Find Home Dir	2 settings; Forward, Reverse	Forward
E225	Encoder Pos Tol	1...50000	100
E226	Counts Per Unit	1...32000	4096

Parameter List (Continued)

Parameter Number	Parameter Name	Description	Factory Default
Enhanced Program Group (Continued)			
E230	Step Units 0	0...64000	0
E232	Step Units 1		
E234	Step Units 2		
E236	Step Units 3		
E238	Step Units 4		
E240	Step Units 5		
E242	Step Units 6		
E244	Step Units 7		
E231	Step Units F 0	0.00...0.99	0.00
E233	Step Units F 1		
E235	Step Units F 2		
E237	Step Units F 3		
E239	Step Units F 4		
E241	Step Units F 5		
E243	Step Units F 6		
E245	Step Units F 7		
E246	Pos Reg Filter	0...15	8
E247	Pos Reg Gain	0.0...200.0	3.0
E248	Enh Control Word	0...1	0
E249	Cmd Stat Select	0...1	0
Advanced Display Group			
d301	Drive Status 2	0...1	Read Only
d302	Fibers Status	0...1	Read Only
d303	Slip Hz Meter	0.0...25.0 Hz	Read Only
d304	Speed Feedback	0...64000 RPM	Read Only
d305	Speed Feedback F	0.0...0.9	Read Only
d306	Encoder Speed	0...64000	Read Only
d307	Encoder Speed F	0.0...0.9	Read Only
d308	Units Traveled H	0...64000	Read Only
d309	Units Traveled L	0.00...0.99	Read Only

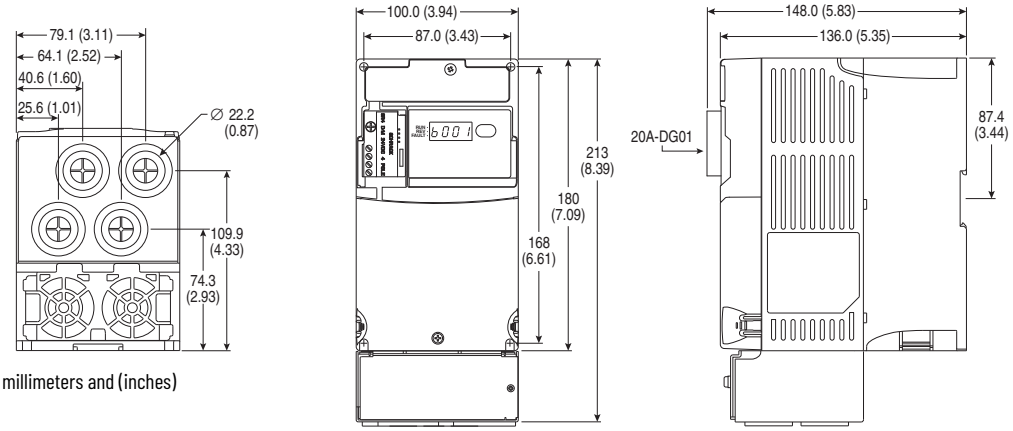
Product Dimensions

Approximate Dimensions

Ratings are in kW and (HP)

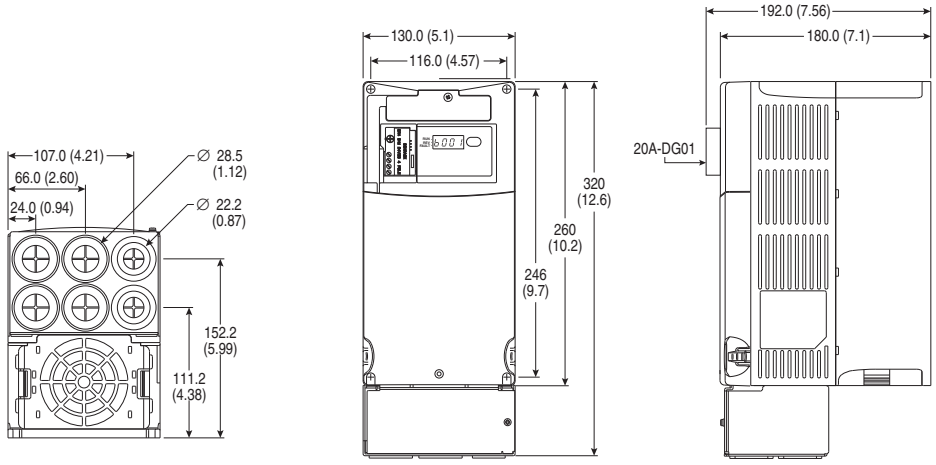
Frame	240V AC — 3-phase		480V AC — 3-phase		600V AC — 3-phase	
B	0.4 (0.5) 0.75 (1.0) 1.5 (2.0)	2.2 (3.0) 3.7 (5.0)	0.4 (0.5) 0.75 (1.0) 1.5 (2.0)	2.2 (3.0) 4.0 (5.0)	0.75 (1.0) 1.5 (2.0)	2.2 (3.0) 4.0 (5.0)
C	11.0 (15.0) 15.0 (20.0)	18.5 (25.0) 22.0 (30.0)	5.5 (7.5) 7.5 (10.0)	11.0 (15.0)	5.5 (7.5) 7.5 (10.0)	11.0 (15.0)

IP30/NEMA 1/ UL Type 1 Option Kit without Communication Option



Dimensions are in millimeters and (inches)

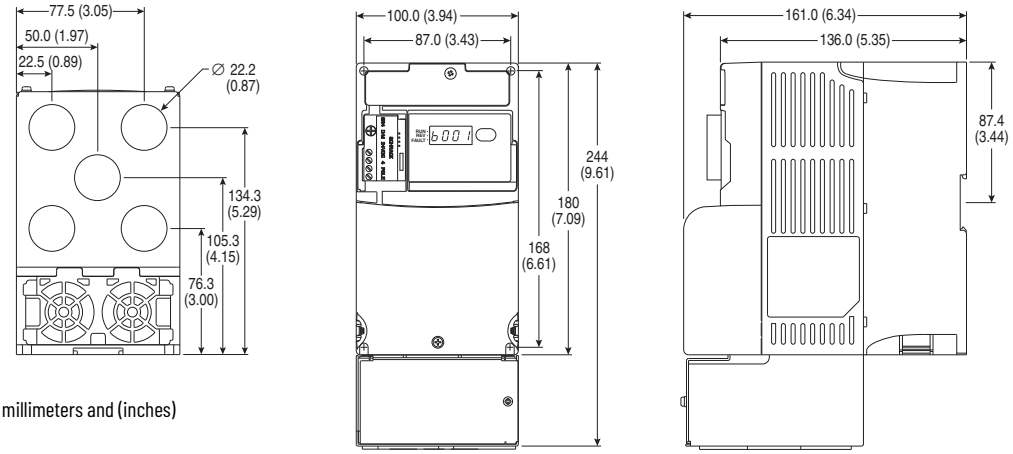
Frame B
(Shown with IP30/NEMA 1/UL Type 1 conversion kit)



Dimensions are in millimeters and (inches)

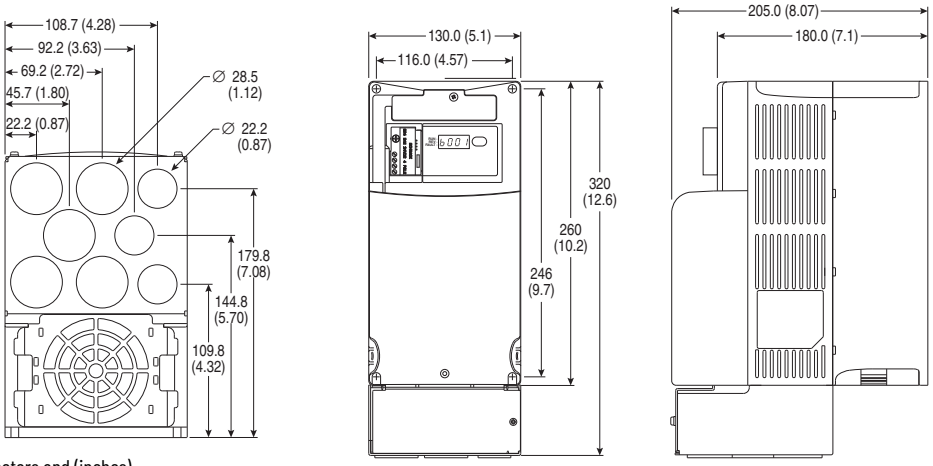
Frame C
(Shown with IP30/NEMA 1/UL Type 1 conversion kit)

IP 30/NEMA 1/UL Type 1 Option Kit with Communication Option



Dimensions are in millimeters and (inches)

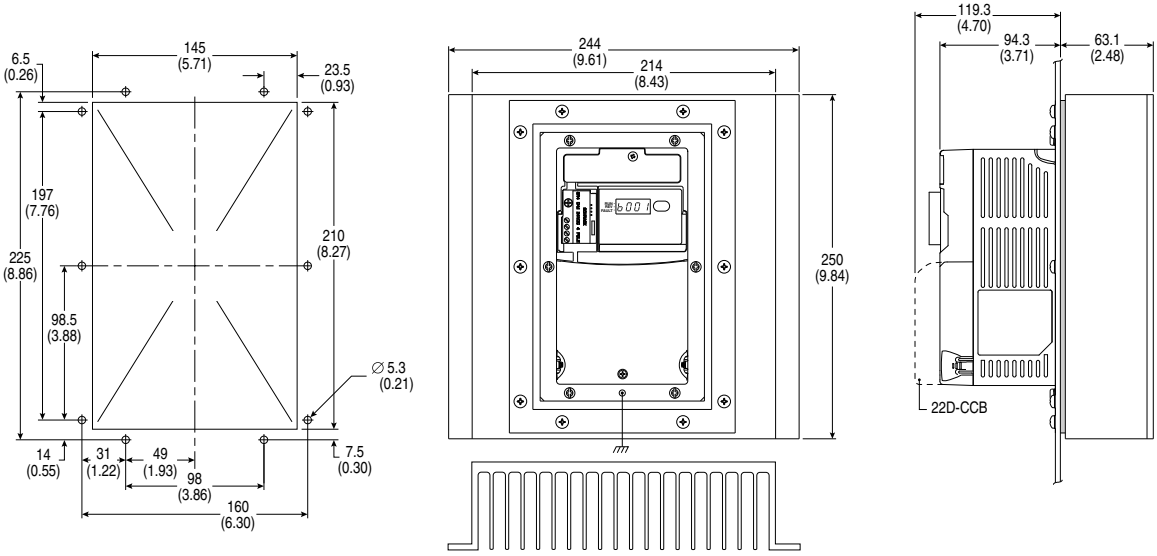
Frame B - 22-JBCB



Dimensions are in millimeters and (inches)

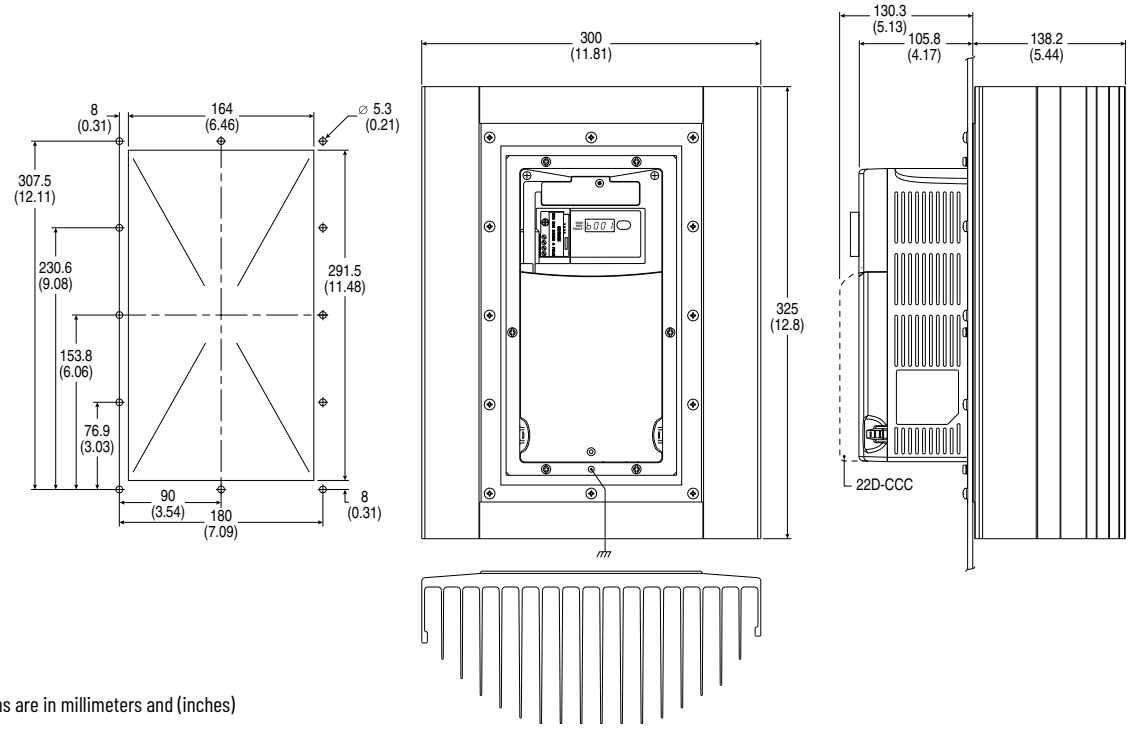
Frame C - 22-JBCC

Flange Mount Drive



Dimensions are in millimeters and (inches)

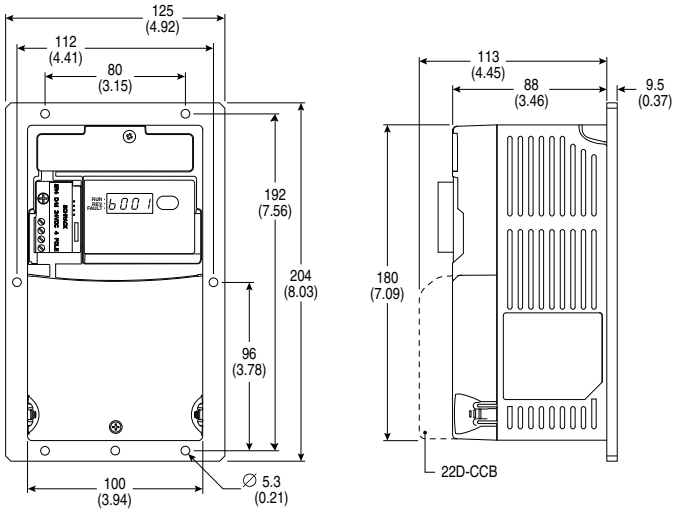
Frame B — Flange Mount



Dimensions are in millimeters and (inches)

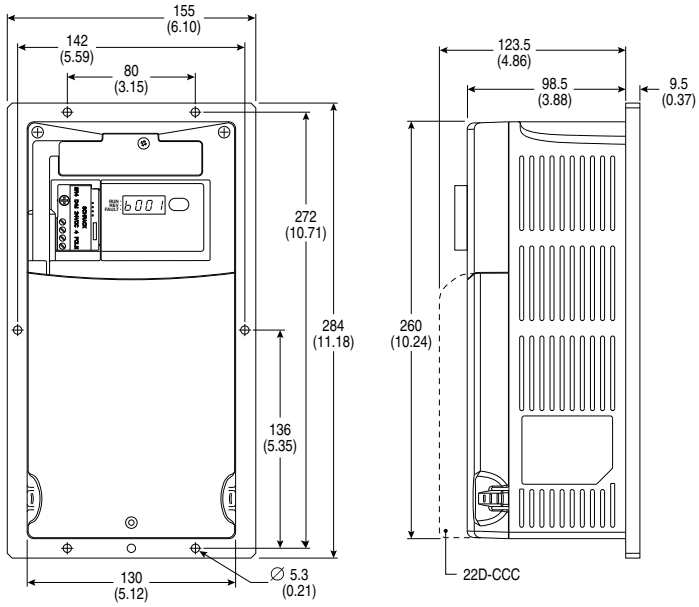
Frame C — Flange Mount

Plate Drive



Dimensions are in millimeters and (inches)

Frame B — Plate Drive

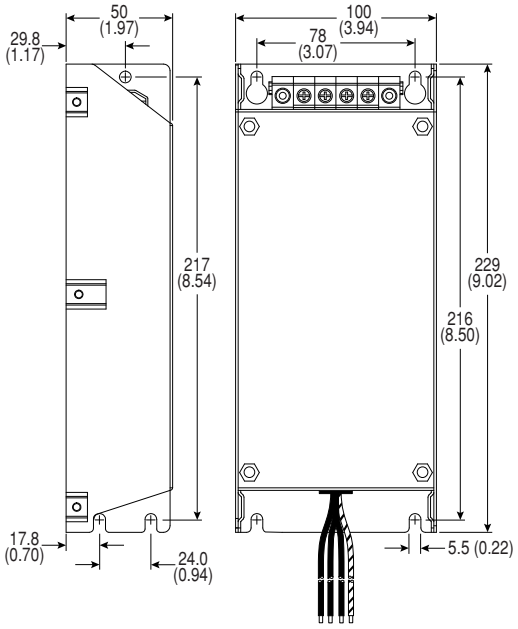


Frame C — Plate Drive

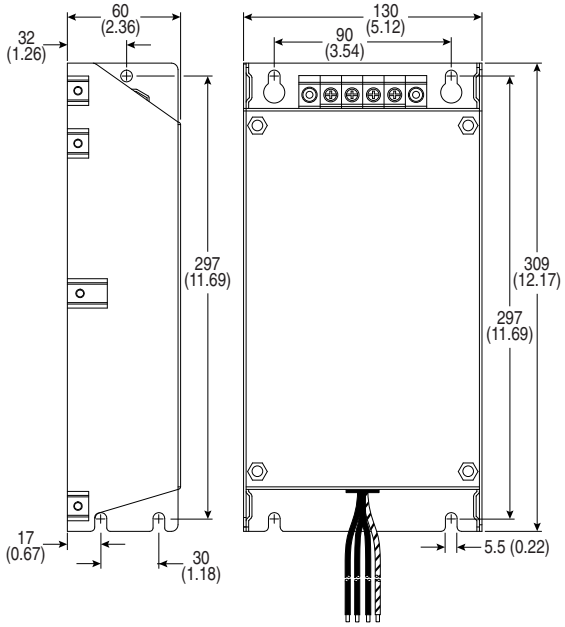
Dimensions are in millimeters and (inches)

EMC Line Filters

Dimensions are in millimeters and (inches)
Catalog Numbers: 22-RF0P8-BL, 22-RF012-BS, 22-RF012-BL (Series B), 22-RF021-BS, 22-RF021-BL

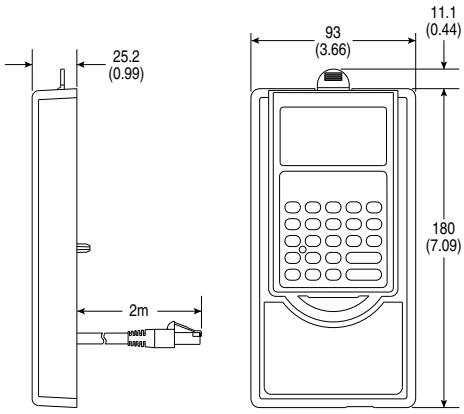


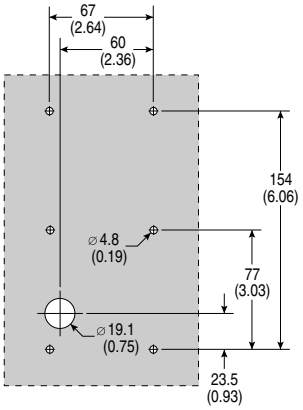
Catalog Numbers: 22-RF018-CS, 22-RF018-CL, 22-RF025-CL, 22-RF026-CS, 22-RF026-CL, 22-RF034-CS, 22-RF034-



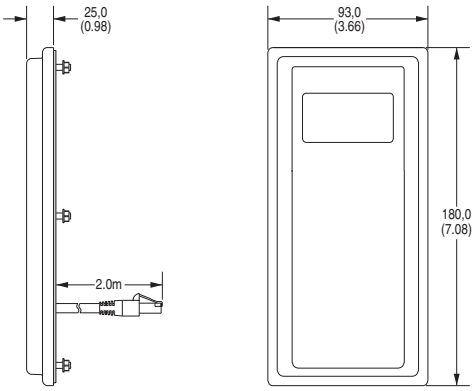
HIM Dimensions

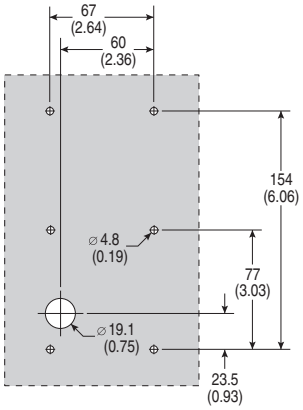
NEMA Type 1 Bezel – Dimensions are in millimeters and (inches)
Catalog Number: 22-HIM-B1





NEMA Type 4X/12 Remote (Panel Mount) Small HIM
– Dimensions are in millimeters and (inches)
Catalog Number: 22-HIM-C2S





Notes:

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Resource	Description
PowerFlex 40P Adjustable Frequency AC Drive User Manual, publication 22D-UM001	Describes how to configure, use, and troubleshoot PowerFlex 40P AC drives.
PowerFlex Dynamic Braking Resistor Calculator Application Technique, publication PFLEX-AT001	Provides information on dynamic braking and how to determine dynamic braking requirements.
PowerFlex AC Drive Performance Specifications per Ecodesign Regulation (EU) 2019/1781 and UK SI 2021 No. 745 Technical Data, publication PFLEX-TD003	Provides specifications per Ecodesign Regulation (EU) 2019/1781 and UK SI 2021 No. 745, including efficiency class.
Drives in Common Bus Configurations Application Technique, publication DRIVES-AT002	Provide the necessary guidelines, considerations, and limitations for the proper application of PowerFlex drives used in common bus configurations.
Wiring and Grounding for Pulse Width Modulated (PWM) AC Drives Installation Instructions, publication DRIVES-IN001	Describes how to install, protect, wire, and ground PWM AC drives.
Preventive Maintenance Checklist of Industrial Control and Drive System Equipment Service Bulletin, publication DRIVES-TD001	Provides a checklist and guidelines for performing preventive maintenance.
EtherNet/IP Network Devices User Manual, publication ENET-UM006	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, publication ENET-RM002	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
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 Selection and Configuration Tools, rok.auto/systemtools	Helps configure complete, valid catalog numbers and build complete quotes based on detailed product information.
Rockwell Automation Global Short-circuit Current Ratings (SCCR) tool, rok.auto/sccr	Provides coordinated high-fault branch circuit solutions for motor starters, soft starters, and component drives.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
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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