



Allen-Bradley

PowerFlex AC Drives *Selection Guide*

PowerFlex 4

PowerFlex 40

PowerFlex 70

PowerFlex 700

PowerFlex 700H

PowerFlex 700S

PowerFlex 7000



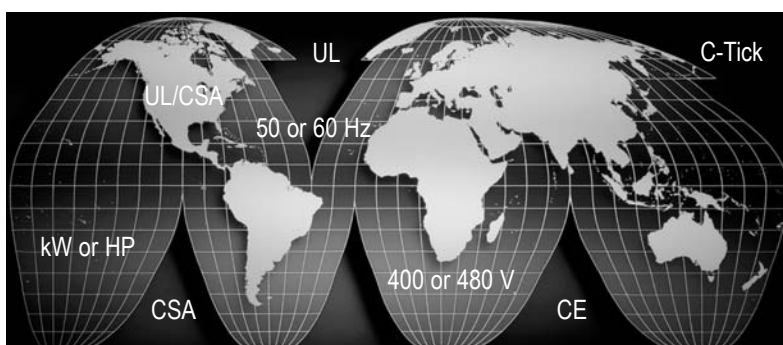
**Rockwell
Automation**



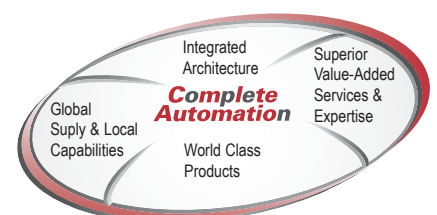
PowerFlex[®] Drives



- **PowerFlex** is the family name for the latest generation of AC drives from Allen-Bradley, demonstrating technology leadership, world class products and innovative AC drive solutions.
- **PowerFlex** AC drives set new standards of AC motor control to meet the global needs of virtually any industrial application from 0.37 kW to 6.7 MW.
- **PowerFlex** AC drives family includes simple V/Hz, Sensorless Vector and Vector Control Solutions to offer optimised drive control solutions for any application.
- **PowerFlex** drives family shares significant commonality across multiple platforms, including communication networks, operator interfaces, programming and hardware items.
- **PowerFlex** AC drives are a complimentary introduction to existing Allen-Bradley drives range today, offering further strength to our customer drive solution services and global leadership position.
- **PowerFlex** AC drives family is designed and manufactured globally to ensure compliance with regional standards, regional power ratings and motor compatibility straight out of the box.
- **PowerFlex** AC drives demonstrate the latest advancements in AC drive technology. Global research & development groups leveraging the Rockwell Science Centre research programs ensure a technology leadership position in IGBT design and innovative packaging concepts.
- **PowerFlex** AC drives benefit users via SMART technology ensuring fast and easy set up in multiple languages as standard (English, Spanish, German, French, Portuguese, Italian and Dutch).
- **PowerFlex** AC drives offer optional internally mounted communication modules to help system integrators, OEM's and End Users alike to build true integrated control systems using either Rockwell Automation Netlinx solutions (ControlNet, EtherNet and DeviceNet) or other open communication networks, (Profibus, InterBus, RS485, Remote I/O, HVAC, LONWORKS, CANopen).
- **PowerFlex** AC drives PowerFlex 700S. This high performance drive for the most demanding stand alone or system applications can be configured with Drive Logix™, an embedded logix controller with multiple programming languages using RSLogix5000™.



The PowerFlex family of drives is supported by global technical services and manufacturing locations worldwide.



«Applications»
Sample selections

Typical Applications for PowerFlex 4, 40, 70, 700 and 700H Product.
A few examples of selecting PowerFlex 4, 40, 70 and 700 AC Drives.

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PowerFlex⁴ AC Drive-«Small in size, big on simplicity»

The right drive for all the single Phase and Three Phase applications in the very low Range.

0.25 kW to 3.7 kW

6/7



PowerFlex⁴⁰ AC Drive-«Optimised Versatility»

Designed with application versatility and robust performance in mind, the PowerFlex 40 is the PowerFlex 4 enhancement with SV Control, more I/O and networking options

0.37 kW to 11 kW

8/9



PowerFlex⁷⁰ AC Drive-«Optimized Simplicity»

This drive offers a low cost compact package of advanced power control and operator interface designed to meet global OEM's and End users alike.

0.37 kW to 37 kW

10/11



PowerFlex⁷⁰⁰ AC Drive-«Optimized Flexibility»

Compact and Flexible, the PowerFlex 700/700H AC-Drive sets new standards in drive design. This drive offers an innovative bookshelf design with «zero stacking» capability, additional I/O expansion within its unique integrated control module cassette.

0.37 kW to 400 kW

12/13

PowerFlex^{700S} 700S and 700S Drive Logix™ overview

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PowerFlex⁷⁰⁰⁰ Medium Voltage Drive overview

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PowerFlex⁷⁰⁰⁰ Software and Communication Connectivity

This section covers the cost effective and easy integration into both Netlinx and other Open network architectures.

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PowerFlex Programming Devices and Communication Options

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This section covers a choice of operator interfaces and easy to use software solutions which are unique to Allen-Bradley drives, it also covers PowerFlex 4, 40, 70 and 700 drives and there is a chart explaining user programming choices.



PowerFlex Communication Adapters

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PowerFlex Human Interface Modules

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PowerFlex_{70X} and **PowerFlex**_{700X} External EMC Filters

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Selection Schaffner and Deltron Filters

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PowerFlex 4 / 40 / 70 / 700 Line Reactors

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Line Input Contactors and Circuit Breakers

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PowerFlex External Brake Resistors

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Medium Duty External Brake Resistors

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Typical Applications for PowerFlex 4, 40, 70, 700 and 700H Product

Normal Duty Applications

PowerFlex Drives are designed and manufactured to meet «normal duty» AC motor applications. These applications (typical list below) represent the majority of application requirements that the PowerFlex Drive will need.



Typical Normal Duty Applications

Pumps, Fans, Blowers



Check Running Amps whenever possible

Cooling Towers
Oven Fans
Air Handling
Screw Compressors
Metering Pumps
Pipeline Pumps
Polymer Pumps
Submersible Pumps
Paint Booths
HVAC Fans
Force Draught Fans
Waste Water Pumps
Utility Pumps

Material Handling,
Mixers and Others



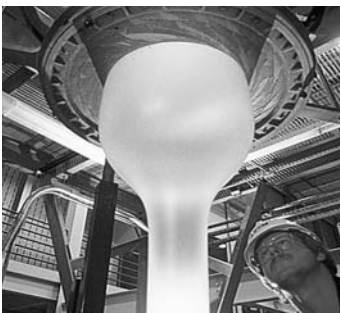
Conveyors
Palletizers
Monorails
Packaging Lines
Filter Tables
Agitators
Blenders
Stirrers

No excessive starting overload, transient overload or duty cycle load increase for Normal Duty Applications

What to look out for in Heavy Duty Applications

Symptom	Typical Heavy Duty Application	PowerFlex Drive Requirement
High Starting Torque	Heavily Loaded Conveyors	150% O/L for 1 min; may need to size one rating larger than motor kW
High Breakaway Torque	Extruders, Mixers	Again more continuous current to break «Load Free» may need to use Drive one size larger than motor kW
High Running Torque	Reciprocating Compressors	Higher level of continuous current required than Normal Duty Rating that «Matches» kW Drive to motor

Extruders and Mixers



Applications (including occasional material handling applications listed above) may require more than the **Normal Duty Capability of the listed PowerFlex 70 and 700 AC Drive** in terms of continuous current output and overload capability.

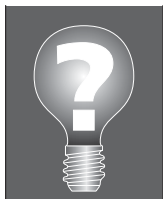


Sample Selections

Motor Application Description	Product Selection	Comments
5.5 kW Hot Water Pump, local start	PF70 (20AC011A0AYNANC0) 5.5 kW, 11.5 Amps with 20-HIM-A3	Normal Duty Application, PowerFlex 70 5.5 kW Drive with LED HIM giving most competitive option
11 kW Oven Conveyor on DeviceNet	PF70 (20AC022A0AYNANC0) 11 kW, 22 Amps with 20-COMM-D Module	Normal Duty Application, no excessive overloads, PF70 offers internal DeviceNet Card for Network Connection
7.5 kW induced Draft Fan, lowest cost option required	PF70 (20AC015A0AYNANC0), 7.5 kW, 15.4 Amps with 20-HIM-A3	PF70 offers the most competitive Allen Bradley Drive between 5.5 kW and 15 kW and is a Normal Duty Application
18.5 kW Screw Compressor, remote I/O connection and «Smart Start», European OEM (Exporting)	PF700 (20BC037A0AYNANC0) 18.5 kW, 37 Amps with 20-HIM-A3 and 20-COMM-R Module	Variable Torque Normal Duty Load, LCD HIM (No LED HIM's on PF700) with Multi-Lingual capability and Remote I/O Communication Module
2 x 15 kW Packaging Line Conveyor Drives, space is «small» for retrofit	PF700 (20BC030A0AYNANC0) 15 kW, 30 Amps	PF700 «Zero Stacking» Feature saves space and is a Normal Duty Application
Inclined Stone Conveyor, 15.0 kW Motor, Smart Start/Analogue Speed and Local Control	PF700 (20BC037A0AYNANC0) 18.5 kW, 37 Amps, with 20-HIM-A4	Heavy Duty Application, needing greater than Normal Duty Ratings increase Drive size to give starting Torque capability
Plastic Extruding Machine, 15 kW Dnet and Lowest Cost HIM	PF700 (20BC037A0AYNANC0) 18.5 kW, 37 Amps with 20-HIM-A3 and 20-COMM-D Module	PF70 Normal Duty @ 15 kW probably not sufficient to provide Breakaway Torque (check AMPS), 18.5 kW is PF700, and lowest cost HIM for PF700 is any LCD version, this is a Heavy Duty Load
120 off 2.2 kW DeviceNet linked AC Drives for Conveyor Line - «Lowest cost Supplier wins»	PF40 (22B-D6P0N104) 2.2 kW, 6 Amps with 22-COMM-D	PF40 still is most competitive product when Price in networking is Major Factor
4 to 6 0.75 kW Motors in a Car Wash Machine	PF4 (22A-A3P6N113) 0.75 kW, 3.6 Amps	PF4 is the perfect choice for simple, economic but still demanding machines

PowerFlex 70 and 700 today have similar Motor Control and Performance Capabilities. PowerFlex 4 and 40 are heavy duty classified only (150% O/L for 1 min.)

So what factors determine which PowerFlex product to select?



	PowerFlex			
	4	40	70	700
«Zero Stacking»	•	•	•	•
Bookcase Design				•
Above 37 kW Applications				•
Smart Start Technology	•	•	•	•
< 37 kW general purpose Drive needs in project mix to reduce overall cost	•	•	•	
Closed Loop Application (vector control option)				•
No cost Network	•	•		



– Small in size, big on simplicity



- ☞ The PowerFlex 4 drive is the smallest and most cost effective member of the PowerFlex family of drives. Ideal for machine level speed control, these products provide the application versatility to meet the demands of global OEM's and end users who require flexibility, space savings and ease for use.
- ☞ 0.25 kW to 2.2 kW, 240V Single Phase, 0.25 to 4 kW 240V and 400V 3-Phase
- ☞ V/Hz Control Modes with Sensorless Vector performances
- ☞ Internal EMC Filter Options for Single Phase and external up to 100m for all 3-Phase
- ☞ Integral Dynamic Brake Chopper
- ☞ Integral RS 485 Communication for multi drop configurations
- ☞ Programmable via DriveExplorer or DriveExecutive (a 22-SCM-232 converter is required)
- ☞ Integral Programming Keypad and local LED status indication
- ☞ "Zero stacking" feature (no spacing required between drives)

PowerFlex 4 Selection Table 200 – 480V

Typical Motor Rating		Catalog Number	Input Voltage	Drive Amps Output			Dimensions HxWxD (mm)	Weight kg	Frame
kW	Amps			Cont.	1 Min	3 sec			
0.25	1.3	22A-A1P4N113	200-240V 50/60Hz, 1-Phase, EMC Filter, no Brake Chopper	1.4	2.1	2.8	152x80x136	1.4	A
0.37	1.9	22A-A2P1N113		2.1	3.2	4.2	152x80x136	1.4	A
0.75	3.3	22A-A3P6N113		3.6	5.4	7.2	152x80x136	1.4	A
1.5	6.1	22A-A6P8N113		6.8	10.2	13.6	180x100x136	2.2	B
2.2	8.9	22A-A9P6N113		9.6	14.4	19.2	180x100x136	2.2	B
0.25	1.3	22A-A1P4N103		200-240V 50/60Hz, 1-Phase, no EMC Filter, no Brake Chopper	1.4	2.1	2.8	152x80x136	1.4
0.37	1.9	22A-A2P1N103	2.1		3.2	4.2	152x80x136	1.4	A
0.75	3.3	22A-A3P6N103	3.6		5.4	7.2	152x80x136	1.4	A
1.5	6.1	22A-A6P8N103	6.8		10.2	13.6	180x100x136	2.2	B
2.2	8.9	22A-A9P6N103	9.6		14.4	19.2	180x100x136	2.2	B
0.25	1.3	22A-A1P5N114	200-240V 50/60Hz, 1-Phase, EMC Filter, Brake Chopper		1.5	2.3	3.0	152x80x136	1.4
0.37	1.9	22A-A2P3N114		2.3	3.5	4.6	152x80x136	1.4	A
0.75	3.3	22A-A4P5N114		4.5	6.8	9.0	152x80x136	1.4	A
1.5	6.1	22A-A8P0N114		8.0	12.0	16.0	180x100x136	2.2	B
0.25	1.3	22A-A1P5N104	200-240V 50/60Hz, 1-Phase, no EMC Filter, Brake Chopper	1.5	2.3	3.0	152x80x136	1.4	A
0.37	1.9	22A-A2P3N104		1.5	2.3	3.0	152x80x136	1.4	A
0.75	3.3	22A-A4P5N104		4.5	6.8	9.0	152x80x136	1.4	A
1.5	6.1	22A-A8P0N104		8.0	12.0	16.0	152x80x136	1.4	B
0.25	1.3	22A-B1P5N104	200-240V 50/60Hz, 3-Phase, no EMC Filter, Brake Chopper	1.5	2.3	3.0	180x100x136	1.4	A
0.37	1.9	22A-B2P3N104		2.3	3.5	4.6	180x100x136	1.4	A
0.75	3.3	22A-B4P5N104		4.5	6.8	9.0	152x80x136	1.4	A
1.5	6.1	22A-B8P0N104		8.0	12.0	16.0	152x80x136	1.4	A
2.2	8.9	22A-B012N104		12.0	18.0	24.0	180x100x136	2.2	B
4	15.3	22A-B017N104		17.0	25.5	34.0	180x100x136	2.2	B
0.37	1.1	22A-D1P4N104	400-480V 50/60Hz, 3-Phase, no EMC Filter, Brake Chopper	1.4	2.1	2.8	152x80x136	1.4	A
0.75	1.9	22A-D2P3N104		2.3	3.5	4.6	152x80x136	1.4	A
1.5	3.5	22A-D4P0N104		4.0	6.0	8.0	152x80x136	1.4	A
2.2	5.0	22A-D6P0N104		6.0	9.0	12.0	180x100x136	2.2	B
4	8.4	22A-D8P7N104		8.7	13.1	17.4	180x100x136	2.2	B

PowerFlex 4 Options

Catalogue No.	Description
External EMC Filter for up to 10m motor cable length	
22-RF9P5-AS	Short cable distance external filter, 9.5A, used with 240V, 3-Phase, A frame
22-RF021-BS	Short cable distance external filter, 21A, used with 240V, 3-Phase, B frame
22-RF5P7-AS	Short cable distance external filter, 5.7A, used with 480V, A frame
22-RF012-BS	Short cable distance external filter, 12A, used with 480V, B frame
External EMC Filter for up to 100m motor cable length	
22-RF010-AL	Long cable distance external filter, 10A, used with 240V, 1-Phase, A frame
22-RF018-BL	Long cable distance external filter, 18A, used with 240V, 1-Phase, B frame
22-RF9P5-AL	Long cable distance external filter, 9.5A, used with 240V, 3-Phase, A frame
22-RF021-BL	Long cable distance external filter, 21A, used with 240V, 3-Phase, B frame
22-RF5P7-AL	Long cable distance external filter, 5.7A, used with 480V, 3-Phase, A frame
22-RF012-BL	Long cable distance external filter, 12A, used with 480V, 3-Phase, B frame
External EMC Filter for Low Leakage Current	
22-RFL010-AS	Low leakage external filter, 10A, used with 240V, 1-Phase, A frame
22-RFL018-BS	Low leakage external filter, 18A, used with 240V, 1-Phase, B frame
22-RFL9P5-AS	Low leakage external filter, 9.5A, used with 240V, 3-Phase, A frame
22-RFL021-BS	Low leakage external filter, 21A, used with 240V, 3-Phase, B frame
22-RFL012-BS	Low leakage external filter, 12A, used with 400V, 3-Phase, B frame
Human Interface Modules & Accessories	
22-HIM-C2S	LCD display, Remote Panel Mount, CopyCat, IP66 HIM, includes 2.9m cable
22-HIM-A3	LCD display, Remote hand held, CopyCat, IP30 HIM, includes 1m cable
22-HIM-B1	Bezel Kit for 22-HIM-A3 panel mounting, includes 2m cable
22-HIM-H10	DSI HIM to RJ45 Port cable - 1m
22-HIM-H30	DSI HIM to RJ45 Port cable - 2.9m
Dynamic Brake Modules - 5% Duty Cycle	
AK-R2-091P500	Brake Resistor for 0.75 and 1.5 kW single and three phase 230V
AK-R2-047P500	Brake Resistor for 2.2 kW single phase and 2.2/4 kW three phase 230V
AK-R2-030P1K2	Brake Resistor for 5.5 and 7.5 kW 230V
AK-R2-360P500	Brake Resistor for 0.75 and 1.5 kW 400V
AK-R2-120P1K2	Brake Resistor for 2.2 to 7.5 kW 400V

PowerFlex[™] 40 – Optimized Versatility



- ☛ 0.37 kW to 2.2 kW, 240V Single Phase, 0.37 to 11 kW 240V and 400V 3-Phase
- ☛ V/Hz Control and Sensorless Vector modes
- ☛ Internal EMC Filter Options for Single Phase and external up to 100m for all drives
- ☛ Integral Dynamic Brake Chopper
- ☛ Extended digital and analog I/O's compared to PowerFlex 4
- ☛ Integral RS 485 Communication for multi drop configurations
- ☛ Optional DeviceNet, EtherNet/IP or Profibus communication module
- ☛ Programmable via DriveExplorer or DriveTools SP
- ☛ Internal PID Loop
- ☛ Integral Programming Keypad and local LED status indication
- ☛ Timer/Counter functions, AND/OR functions, STEP Logic
- ☛ "Zero stacking" feature (no spacing required between drives)

PowerFlex 40 Selection Table 200 – 480V

Typical Motor Rating		Catalog Number	Input Voltage	Drive Amps Output			Dimensions HxWxD (mm)	Weight kg	Frame
kW	Amps			Cont.	1 Min	3 sec			
0.37	1.9	22B-A2P1N114	200-240V 50/60Hz, 1-Phase, EMC Filter, Brake Chopper	2.3	3.5	4.6	180x100x136	2.2	B
0.75	3.3	22B-A5P0N114		5.0	7.5	10.0	180x100x136	2.2	B
1.5	6.1	22B-A8P0N114		8.0	12.0	16.0	180x100x136	2.2	B
2.2	8.9	22B-A012N114		12.0	18.0	24.0	260x100x180	4.3	C
0.37	1.9	22B-A2P3N104	200-240V 50/60Hz, 1-Phase, no EMC Filter, Brake Chopper	2.3	3.5	4.6	180x100x136	2.2	B
0.75	3.3	22B-A5P0N104		5.0	7.5	10.0	180x100x136	2.2	B
1.5	6.1	22B-A8P0N104		8.0	12.0	16.0	180x100x136	2.2	B
2.2	8.9	22B-A012N104		12.0	18.0	24.0	260x100x180	4.3	C
0.37	1.9	22B-B2P3N104	200-240V 50/60Hz, 3-Phase, no EMC Filter, Brake Chopper	2.3	3.5	4.6	180x100x136	2.2	B
0.75	3.3	22B-B5P0N104		5.0	7.5	10.0	180x100x136	2.2	B
1.5	6.1	22B-B8P0N104		8.0	12.0	16.0	180x100x136	2.2	B
2.2	8.9	22B-B012N104		12.0	18.0	24.0	180x100x136	2.2	B
4	15.3	22B-B017N104		17.0	25.5	34.0	180x100x136	2.2	B
5.5	21.0	22B-B024N104		24.0	36.0	48.0	260x100x180	4.3	C
7.5	28.0	22B-B033N104		33.0	49.5	66.0	260x100x180	4.3	C
0.37	1.1	22B-D1P4N104	400-480V 50/60Hz, 3-Phase, no EMC Filter, Brake Chopper	1.4	2.1	2.8	180x100x136	2.2	B
0.75	1.9	22B-D2P3N104		2.3	3.5	4.6	180x100x136	2.2	B
1.5	3.5	22B-D4P0N104		4.0	6.0	8.0	180x100x136	2.2	B
2.2	5.0	22B-D6P0N104		6.0	9.0	12.0	180x100x136	2.2	B
4	8.4	22B-D010N104		10.0	15.0	20.0	180x100x136	2.2	B
5.5	11.4	22B-D012N104		12.0	18.0	24.0	260x100x180	4.3	C
7.5	15.0	22B-D017N104		17.0	25.5	34.0	260x100x180	4.3	C
11	22.0	22B-D024N104		24.0	36.0	48.0	260x100x180	4.3	C

PowerFlex 40 Options

Catalogue No.	Description
External EMC Filter for up to 10m motor cable length	
22-RF021-BS	Short cable distance external filter, 21A, used with 240V, 3-Phase, B frame
22-RF034-CS	Short cable distance external filter, 34A, used with 240V, 3-Phase, C frame
22-RF012-BS	Short cable distance external filter, 12A, used with 480V, B frame
22-RF018-CS	Short cable distance external filter, 18A, used with 480V, C frame
22-RF026-CS	Short cable distance external filter, 26A, used with 480V, C frame
External EMC Filter for up to 100m motor cable length	
22-RF018-BL	Long cable distance external filter, 18A, used with 240V, 1-Phase, B frame
22-RF025-CL	Long cable distance external filter, 25A, used with 240V, 1-Phase, C frame
22-RF021-BL	Long cable distance external filter, 21A, used with 240V, 3-Phase, B frame
22-RF034-CL	Long cable distance external filter, 34A, used with 240V, 3-Phase, C frame
22-RF012-BL	Long cable distance external filter, 12A, used with 480V, 3-Phase, B frame
22-RF018-CL	Long cable distance external filter, 18A, used with 480V, 3-Phase, C frame
22-RF026-CL	Long cable distance external filter, 26A, used with 480V, 3-Phase, C frame
Human Interface Modules & Accessories	
22-HIM-C2S	LCD display, Remote Panel Mount, CopyCat, IP66 HIM, includes 2.9m cable
22-HIM-A3	LCD display, Remote hand held, CopyCat, IP30 HIM, includes 1m cable
22-HIM-B1	Bezel Kit for 22-HIM-A3 panel mounting, includes 2m cable
22-HIM-H10	DSI HIM to RJ45 Port cable - 1m
22-HIM-H30	DSI HIM to RJ45 Port cable - 2.9m
Dynamic Brake Modules - 5% Duty Cycle	
AK-R2-091P500	Brake Resistor for 0.75 and 1.5 kW single and three phase 230V
AK-R2-047P500	Brake Resistor for 2.2 kW single phase and 2.2/4 kW three phase 230V
AK-R2-030P1K2	Brake Resistor for 5.5 and 7.5 kW 230V
AK-R2-360P500	Brake Resistor for 0.75 and 1.5 kW 400V
AK-R2-120P1K2	Brake Resistor for 2.2 to 7.5 kW 400V

**NEW
Safe-off
Option**

PowerFlex[®] 70 – Optimized Simplicity



- ☞ The PowerFlex[®] 70 offers a compact package of power, control and operator interface designed to meet the demands for space, simplicity and reliability while providing a broad spectrum of features, allowing the user to easily configure the drive for most application needs.
- ☞ 0.37 kW to 37 kW, 400V 3-Phase
- ☞ 200-240V, 480V and 600V, 3-Phase units available on request
- ☞ Small physical size, with in-built RFI filter and dynamic braking transistor
- ☞ IP66 stand alone and flange mount packaging
- ☞ Multi-Lingual LCD HIM with S.M.A.R.T. feature
- ☞ Offers internal communication modules for a wide range of Industrial Automation Networks
- ☞ “Zero stacking” feature (no spacing required between drives)
- ☞ IP66 ratings also available with integrated HIM
- ☞ Integrated DC choke and PTC Resistor input
- ☞ Option cards DriveGuard[™] “Safe-off” and encoder feedback interface

PowerFlex 70 Selection Table, 400V, IP20, EMC

Typical Motor Rating		Catalog Number	Drive Amps Output			Dimensions HxWxD (mm)	Weight kg	Frame
kW	Amps		Cont.	1 Min	3 sec			
0.37	1.1	20AC1P3A0AYNANC0	1.3	1.4	1.9	235x171x180	4.5	B
0.75	1.9	20AC2P1A0AYNANC0	2.1	2.4	3.2	235x171x180	4.5	B
1.5	3.5	20AC3P5A0AYNANC0	3.5	4.5	6.0	235x171x180	4.5	B
2.2	5.0	20AC5P0A0AYNANC0	5.0	5.5	7.5	235x171x180	4.5	B
4.0	8.4	20AC8P7A0AYNANC0	8.7	9.9	13.2	235x171x180	4.5	B
5.5	11.4	20AC011A0AYNANC0	11.5	13.0	17.4	300x186x180	7.6	C
7.5	15.0	20AC015A0AYNANC0	15.4	17.2	23.1	300x186x180	7.6	C
11.0	22.0	20AC022A0AYNANC0	22.0	24.2	33.0	350x220x180	9.8	D
15.0	29.0	20AC030A0AYNANC0	30.0	33.0	45.0	350x220x180	9.8	D
18.5	34.0	20AC037A0AYNANC0	37.0	45.0	60.0	350x220x180	9.8	D
22.0	40.0	20AC043A0AYNANC0	43.0	55.0	74.0	350x220x180	9.8	D
30.0	53.0	20AC060A0AYNANC0	60.0	66.0	99.0	556x350x207	18.6	E
37.0	65.0	20AC072A0AYNANC0	72.0	90.0	120.0	556x350x207	18.6	E

PowerFlex 70 Selection Table, 400V, IP20

Typical Motor Rating		Catalog Number	Drive Amps Output			Dimensions HxWxD (mm)	Weight kg	Frame
kW	Amps		Cont.	1 Min	3 sec			
0.37	1.1	20AC1P3A0AYNNNC0	1.3	1.4	1.9	226X122X180	2.8	A
0.75	1.9	20AC2P1A0AYNNNC0	2.1	2.4	3.2	226X122X180	2.8	A
1.5	3.5	20AC3P5A0AYNNNC0	3.5	4.5	6.0	226X122X180	2.8	A
2.2	5.0	20AC5P0A0AYNNNC0	5.0	5.5	7.5	226X122X180	2.8	A
4.0	8.4	20AC8P7A0AYNNNC0	8.7	9.9	13.2	226X122X180	2.8	A

PowerFlex 70 Selection Table, 400V, IP66, (NEMA 4X), EMC

Typical Motor Rating		Catalog Number	Drive Amps Output			Dimensions HxWxD (mm)	Weight kg	Frame
kW	Amps		Cont.	1 Min	3 sec			
0.37	1.1	20AC1P3C0AYNANC0	1.3	1.4	1.9	240x171x203	4.5	B
0.75	1.9	20AC2P1C0AYNANC0	2.1	2.4	3.2	240x171x203	4.5	B
1.5	3.5	20AC3P5C0AYNANC0	3.5	4.5	6.0	240x171x203	4.5	B
2.2	5.0	20AC5P0C0AYNANC0	5.0	5.5	7.5	240x171x203	4.5	B
4.0	8.4	20AC8P7C0AYNANC0	8.7	9.9	13.2	240x171x203	4.5	B
5.5	11.0	20AC011C0AYNANC0	11.5	13.0	17.4	350x220x211	9.8	D
7.5	15.0	20AC015C0AYNANC0	15.4	17.2	23.1	350x220x211	9.8	D
11.0	21.0	20AC022C0AYNANC0	22.0	24.2	33.0	350x220x211	9.8	D
15.0	29.0	20AC030C0AYNANC0	30.0	33.0	45.0	350x220x211	9.8	D
18.5	34.0	20AC037C0AYNANC0	37.0	45.0	60.0	350x220x211	9.8	D
22.0	40.0	20AC043C0AYNANC0	43.0	55.0	74.0	350x220x211	9.8	D
30.0	53.0	20AC060C0AYNANC0	60.0	66.0	99.0	556x350x207	18.6	E
37.0	65.0	20AC072C0AYNANC0	72.0	90.0	120.0	556x350x207	18.6	E

PowerFlex 70 Options

Catalogue No.	Description
External EMC Filter for Frame A	
Catalogue No.	Description
20A-RF-05-A-3	EMC Line Filter PF70, 200-480V, 3-Phase, 5A, IP20
Internal Brake Resistors - 5% Duty Cycle	
20AD-DB1-A	Brake Resistor Kit, PowerFlex 70 Frame A, 380-600V, 115 Ohm
20AD-DB1-B	Brake Resistor Kit, PowerFlex 70 Frame B, 380-600V, 115 Ohm
20AD-DB1-C	Brake Resistor Kit, PowerFlex 70 Frame C, 380-600V, 115 Ohm
20AD-DB1-D	Brake Resistor Kit, PowerFlex 70 Frame D, 380-480V, 62 Ohm
Human Interface Modules	
20-HIM-A2	Human Interface Module, Digital LCD
20-HIM-A3	Human Interface Module, Full Numeric LCD
20-HIM-A4	Human Interface Module, Analog LCD
20-HIM-A5	Human Interface Module, Programming Only LCD
20-HIM-B1	Human Interface Module, Door Mount Bezel Kit, IP20
20-HIM-C3S	Human Interface Module, Full Numeric LCD, IP66
20-HIM-C5S	Human Interface Module, Programming Only LCD, IP66
20-HIM-H10	Cable to allow remote use of HIM Module 1 meter
Feedback Option	
20A-ENC-1	PowerFlex 70 Encoder Feedback interface 12/5V
DriveGuard Safe-off	
20A-DG01	DriveGuard Safe-off Board

PowerFlex[™] 700 – Optimized Flexibility



- ☞ The PowerFlex 700® offers outstanding performance in an easy-to-use drive that users have come to expect from Rockwell Automation. This world-class performance comes in a small and competitively priced package. The PowerFlex 700® is designed to control three phase induction motors in applications with requirements ranging from the simplest speed control to the most demanding torque control.
- ☞ 0.75 kW to 132 kW, 400V 3-Phase (PF700)
- ☞ 160 kW to 400 kW, 400V 3-Phase (PF700H)
- ☞ 200-240V, 480V, 600V and 690V 3-Phase units available on request
- ☞ V/Hz-, Sensorless Vector and Vector Control (not in PF700H) in one Drive
- ☞ Speed and Torque Control with and without encoder feedback
- ☞ Speed or Torque reference in Vector Control
- ☞ Parameter linking functionality
- ☞ “Zero stacking” feature (no spacing required between drives)
- ☞ PowerFlex 700H Frame 10 standard floor standing cabinet
- ☞ Integrated Brake chopper
- ☞ Integrated AC or DC choke
- ☞ PTC Resistor input and encoder feedback interface option card

PowerFlex 700 Selection Table, 400V, IP20, EMC

Typical Motor Rating		Catalog Number	Drive Amps Output			Dimensions HxWxD (mm)	Weight kg	Frame
kW	Amps		Cont.	1 Min	3 sec			
0.75	1.9	20BC2P1A0AYNANC0	2.1	2.4	3.2	336x110x200	5.2	0
1.5	3.5	20BC3P5A0AYNANC0	3.5	4.5	6	336x110x200	5.2	0
2.2	5.0	20BC5P0A0AYNANC0	5	5.5	7.5	336x110x200	5.2	0
4	8.4	20BC8P7A0AYNANC0	8.7	9.9	13.2	336x110x200	5.2	0
5.5	11.0	20BC011A0AYNANC0	11.5	13	17.4	336x110x200	5.2	0
7.5	15.0	20BC015A0AYNANC0	15.4	17.2	23.1	336x135x200	7.1	1
11	22.0	20BC022A0AYNANC0	22	24.2	33	336x135x200	7.1	1
15	29.0	20BC030A0AYNANC0	30	33	45	343x220x200	12.5	2
18.5	34.0	20BC037A0AYNANC0	37	45	60	343x220x200	12.5	2
22	40.0	20BC043A0AYNANC0	43	55.5	74	518x220x200	18.6	3
30	53.0	20BC056A0AYNANC0	56	64.5	86	518x220x200	18.6	3
37	65.0	20BC072A0AYNANC0	72	84	112	518x220x200	18.6	3
45	78.0	① 20BC085A0AYNANC0	85 (72)	94 (108)	128 (144)	759x220x200	24.5	4
55	98.0	① 20BC105A0AYNANC0	105 (85)	116 (128)	158(170)	645x309x276	38	5
75	132.0	① 20BC140A0AYNANC0	140 (105)	154 (157)	190 (190)	850x404x276	72	5
90	158.0	① 20BC170A0AYNANC0	170 (140)	187 (210)	255 (280)	850x404x276	72	6
110	194.0	① 20BC205A0AYNANC0	205 (170)	220 (255)	300 (340)	850x404x276	72	6
132	235.0	① 20BC260A0AYNANC0	260 (205)	286 (308)	390 (410)	850x404x276	72	6

① Also available without Brake chopper (Catalog No. 20BCxxAxxNxxxxx)

() Values in brackets are Heavy Duty application Amps. The drive may be operated at either rating.

NEW
PowerFlex
700H

PowerFlex 700H Selection Table, 400V, IP20, EMC

Typical Motor Rating		Catalog Number	Drive Amps Output			Dimensions	Weight	Frame
kW	Amps		Cont.	1 Min	3 sec	HxWxD (mm)	kg	
160	276	20CC300A0ANNBNA0	300	330	500	1150x480x362	143	9
200	345	20CC385A0ANNBNA0	385	424	600	② 2275x600x600	447	10
250	440	20CC460A0ANNBNA0	460	506	770	② 2275x600x600	447	10
280	493	20CC500A0ANNBNA0	500	550	750	② 2275x600x600	447	10
315	550	20CC590A0ANNBNA0	590	649	885	② 2275x800x600	480	11
355	620	20CC650A0ANNBNA0	650	715	975	② 2275x800x600	480	11
400	700	20CC730A0ANNBNA0	730	803	1095	② 2275x800x600	480	11

② Rittal Cabinet

PowerFlex 700 Options

Catalogue No.	Description
Internal Brake Resistors - 5% Duty Cycle	
20BD-DB1-0	Brake Resistor Kit, PowerFlex 700 Frame 0, 380-600V, 115 Ohm
20BD-DB1-1	Brake Resistor Kit, PowerFlex 700 Frame 1, 380-600V, 115 Ohm
20BD-DB1-2	Brake Resistor Kit, PowerFlex 700 Frame 2, 380-480V, 68 Ohm
Human Interface Modules	
20-HIM-A2	Human Interface Module, Digital LCD
20-HIM-A3	Human Interface Module, Full Numeric LCD
20-HIM-A4	Human Interface Module, Analog LCD
20-HIM-A5	Human Interface Module, Programming Only LCD
20-HIM-B1	Human Interface Module, Door Mount Bezel Kit, IP20
20-HIM-C3S	Human Interface Module, Full Numeric LCD, IP66
20-HIM-C5S	Human Interface Module, Programming Only LCD, IP66
20-HIM-H10	Cable to allow remote use of HIM Module 1 meter
Feedback Option	
20B-ENC-2	PowerFlex 700 Encoder Feedback interface 12/5V
Upgrade Kit Vector Control to upgrade PowerFlex 700 Standard Control	
20B-VECT-C0	Vector Control, 24V I/O, PowerFlex 700
20B-VECT-D0	Vector Control, 115V I/O, PowerFlex 700



PowerFlex™ 700S – Optimized Integration

- ☞ High-performance vector control algorithms utilizing FORCE Technology for both Induction and Permanent Magnet Control.
- ☞ Integrated Position loop for applications from simple indexing to electronic line shaft applications.
- ☞ Multiple feedback options optimize the accuracy of speed and position control.
- ☞ SynchLink™, a high-performance, high speed, synchronization and drive-to drive data link.
 - ☞ Processor synchronization for multiple devices within 1 u Sec.
 - ☞ 50 u Sec maximum transfer rates with multiple data configurations.
 - ☞ Transmitting drive and application data.
- ☞ DriveLogix, the embedded Logix engine, provides PLC programmability, with an industry standard programming environment.
- ☞ 200-240V, 400-480V, 500-600V/690V up to 280 kW

PowerFlex 700S Selection Table, 400V, 3-Phase, IP20, EMC

Typical Motor Rating		Catalog Number	Drive Amps Output			Dimensions HxWxD (mm)	Weight kg	Frame
kW	Amps		Cont.	1 Min	3 sec			
0.75	2.1	20DC2P1A0EYNANANE ①	2.1	2.4	3.2	336x167x200	7.03	1
1.5	3.5	20DC3P5A0EYNANANE ①	3.5	4.5	6	336x167x200	7.03	1
2.2	5.0	20DC5P0A0EYNANANE ①	5	5.5	7.5	336x167x200	7.03	1
4	8.7	20DC8P7A0EYNANANE ①	8.7	9.9	13.2	336x167x200	7.03	1
5.5	11.5	20DC011A0EYNANANE ①	11.5	13	17.4	336x167x200	7.03	1
7.5	15.4	20DC015A0EYNANANE ①	15.4	17.2	23.1	336x167x200	7.03	1
11	22.0	20DC022A0EYNANANE ①	22	24.2	33	336x167x200	7.03	1
15	29.0	20DC030A0EYNANANE ①	30	33	45	343x254x200	12.5	2
18.5	34.0	20DC037A0EYNANANE ①	37	45	60	343x254x200	12.5	2
22	40.0	20DC043A0EYNANANE ①	43	55.5	74	518x254x200	18.6	3
30	53.0	20DC056A0EYNANANE ①	56	64.5	86	518x254x200	18.6	3
37	65.0	20DC072A0EYNANANE ①	72	84	112	518x254x200	18.6	3
45	78.0	② 20DC085A0EYNANANE ①	85 (72)	94 (108)	128 (144)	759x252x202	24.5	4
55	98.0	② 20DC105A0EYNANANE ①	105 (85)	116 (128)	158 (170)	645x340x275	37.2	5
75	132.0	② 20DC140A0EYNANANE ①	140 (105)	154 (157)	190 (190)	645x340x275	37.2	5
90	158.0	② 20DC170A0EYNANANE ①	170 (140)	187 (210)	255 (280)	976x436x276	71.4	6
110	184.0	② 20DC205A0EYNANANE ①	205 (170)	220 (255)	300 (340)	976x436x276	71.4	6
132	235.0	② 20DC260A0EYNANANE ①	260 (205)	286 (308)	390 (410)	976x436x276	71.4	6
160	276.0	② 20DC300A0EYNBNNNN ③	300 (225)	330 (368)	500 (490)	1150x480x362	143	9
200	345.0	20DC385A0ENNBNNNN ③	385 (300)	424 (450)	600 (600)	2275x600x600	447	10
250	440.0	20DC460A0ENNBNNNN ③	460 (385)	506 (578)	770 (770)	2275x600x600	447	10
280	493.0	20DC500A0ENNBNNNN ③	500 (420)	550 (630)	750 (840)	2275x600x600	447	10
315	550.0	20DC590A0ENNBNNNN ③	590 (520)	649 (780)	1040 (1040)	2275x800x600	480	11
355	620.0	20DC650A0ENNBNNNN ③	650 (590)	715 (885)	1180 (1180)	2275x800x600	480	11
400	700.0	20DC730A0ENNBNNNN ③	730 (630)	803 (945)	1095 (1260)	2275x800x600	480	11

① Also available with DriveLogix5730 (Catalog No. 20DCxxxAXxxxxAxK)

② Also available without Brake chopper (Catalog No. 20DCxxAxNxxxxx)

③ Series A (Phase 1) also available with DriveLogix5720 (Catalog No. 20DCxxxA0ENNBNNNA)

() Values in brackets are Heavy Duty application Amps. The drive may be operated at either rating.

PowerFlex 700S Options

Catalog No.	Description
20D-RES-A1	Feedback Option Card for Resolver, 10-26V, 10kHz, 10-16 bit
20D-STEG-B1	Feedback Option Card for Stegmann, High Resol. Encoder, Hiperface, 8.5V DC, 20 bit, 100 k/r
20D-MDI-C1	Feedback Option Card Multi-Device Interface for Stegmann Encoder or Temposonics Linear Sensor
20D-P2-ENC0	Feedback Option Card for 2nd Encoder, 5V or 12V configurable by the drive
20D-P2-SLB0	SynchLink Option Interface
20D-P2-ENET0	PowerFlex 700S Embedded EtherNet/IP Option
20D-DL2-ENET0	DriveLogix5730 Embedded EtherNet/IP Option
20D-DL2-LEB0	DriveLogix5730 Expansion Board (Compact Flash, Compact I/O, Daughter card)

Internal Brake Resistors - 5% Duty Cycle

Catalog No.	Description
20BD-DB1-0	Brake Resistors Kit, PowerFlex 700 Frame 0, 380-600V, 115 Ohm
20BD-DB1-1	Brake Resistors Kit, PowerFlex 700 Frame 1, 380-600V, 115 Ohm
20BD-DB1-2	Brake Resistors Kit, PowerFlex 700 Frame 2, 380-480V, 68 Ohm

Human Interface Modules

20-HIM-A2	Human Interface Module, Digital LCD
20-HIM-A3	Human Interface Module, Full Numeric LCD
20-HIM-A4	Human Interface Module, Analog LCD
20-HIM-A5	Human Interface Module, Programming only LCD
20-HIM-B1	Human Interface Module, Door Mount Bezel Kit, IP20
20-HIM-C3S	Human Interface Module, Full Numeric LCD, IP66
20-HIM-C5S	Human Interface Module, Programming only LCD, IP66
20-HIM-H10	Cable to allow remote use of HIM Module

DriveLogix5730 Communication Accessories

20D-DL2-CL3	Compact I/O left bus cable (1meter)
20D-DL2-CR3	Compact I/O right bus cable (1meter)
④ 1788-CNC	Daughter card ControlNet, single coax Media connector
④ 1788-CNCR	Daughter card DriveLogix ControlNet, redundant coax Media connector
④ 1788-CNF	Daughter card DriveLogix ControlNet, single fiber optic connector
④ 1788-CNFR	Daughter card DriveLogix ControlNet, redundant fiber optic connector
④ 1788-DNBO	Daughter card DriveLogix DeviceNet
④ 1788-ENBT	Daughter card DriveLogix EtherNet/IP

SynchLink Accessories

1751-SLBA/A	SynchLink Base Block (up to 4 splitter blocks)
1751-SL4SP/A	SynchLink 4 Port Splitter Block
1751-SLBP/A	SynchLink Bypass Switch Block
1403-CF001	Fiber optic cable assembly 2x1 Meter
1403-CF003	Fiber optic cable assembly 2x3 Meter
1403-CF005	Fiber optic cable assembly 2x5 Meter
1403-CF010	Fiber optic cable assembly 10 Meter
1403-CF020	Fiber optic cable assembly 20 Meter
1403-CF050	Fiber optic cable assembly 50 Meter
1403-CF100	Fiber optic cable assembly 100 Meter
1403-CF250	Fiber optic cable assembly 250 Meter

④ Requires Logix Expansion Board (20D-DL2-LEB0)

PowerFlex 7000 – Medium Voltage AC Drive



- ☛ 600 kW to 6.7 MW, from 2.4 to 6.6 kV
- ☛ Speed, torque and direction control of AC induction or synchronous motors
- ☛ Low Harmonic solutions with 6 pulse, 18 pulse and PWM rectifier options
- ☛ Global product: IEC / NEMA / CSA
- ☛ Advanced SGCT Inverter switch, offering low losses and high reliability
- ☛ Low parts count for further increased reliability and ease of maintenance

The unique design of the PowerFlex 7000 features a patented PowerCage™ containing the drives main power components, this new modular design allows simplicity in design providing a low parts count giving high reliability, and ease of maintenance for reduced down-time.



For further information and guidance on medium voltage contact your local Rockwell Automation office

Benefits of MV Drives

- Reduced running costs
 - Energy Savings on fans, pumps and compressors
 - Reduced maintenance on mechanical equipment
 - Increased life of mechanical equipment
- Improved Process Control
 - Increase productivity, flexibility and environmental compliance
- Starting large motors on «Weak» power supplies
 - Eliminate voltage flicker
 - Reduce inrush current
 - Higher starting torque than reduced voltage control

PowerFlex 7000

- Small foot print
- Lower component count/higher reliability than competitors
- Allen-Bradley has proven success in MV up to and inc. 6.6 kV
- As other PowerFlex drives the 7000 offers «motor friendly» control
- PowerFlex 7000 can be used without an isolation transformer with the AFE rectifier solution

PowerFlex 7000 MV Drive Family



PowerFlex 7000 "A" Frame

- Low end power range, 150-930kW
- 2400 to 6600V nominal supply voltage ratings
- Air cooling
- Compact packaging for smallest footprint requirements
- Three input configurations for optimum installation flexibility:
 - 1) Base drive with provision for connecting to indoor or outdoor transformer
 - 2) Base drive with integral isolation transformer
 - 3) Base drive with integral line reactor and input starter
- Normal duty service rating (for variable torque loads, 110% overload for 1 minute every 10 minutes)
- Heavy duty service rating (for constant torque loads, 150% overload for 1 minute every 10 minutes)
- Two rectifier types:
 - 1) PWM rectifier (active front end) for low line harmonics, high power factor and commonality of parts
 - 2) Basic 6 pulse rectifier for the lowest cost solution
- 3 Cables in / 3 cables out for lower installation costs



PowerFlex 7000 "B" Frame

- Low and Medium power range, 150-4100kW
- 2400 to 6600V nominal supply voltage ratings
- Air cooling
- Small footprint for medium power range
- Normal duty service rating (for variable torque loads, 110% overload for 1 minute every 10 minutes)
- Heavy duty service rating (for constant torque loads, 150% overload for 1 minute every 10 minutes)
- Three rectifier types:
 - 1) PWM rectifier (active front end) for low line harmonics, high power factor and commonality of parts
 - 2) 18 Pulse rectifier for low line harmonics and connection to a high voltage distribution system
 - 3) Basic 6 pulse rectifier for the lowest cost solution
- 3 Cables in / 3 cables out (6 pulse and PWM rectifier)
- 9 Cables in / 3 cables out (18 pulse rectifier)

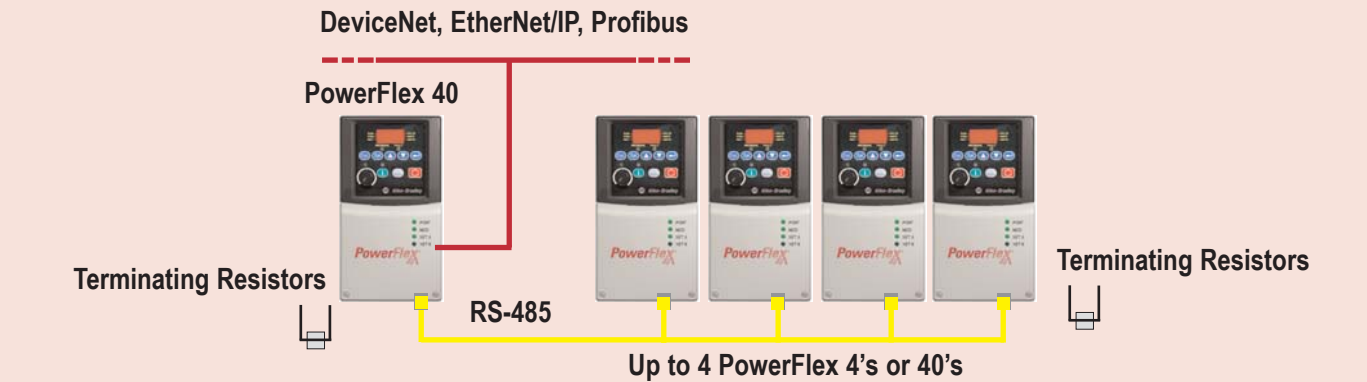


PowerFlex 7000L "C" Frame

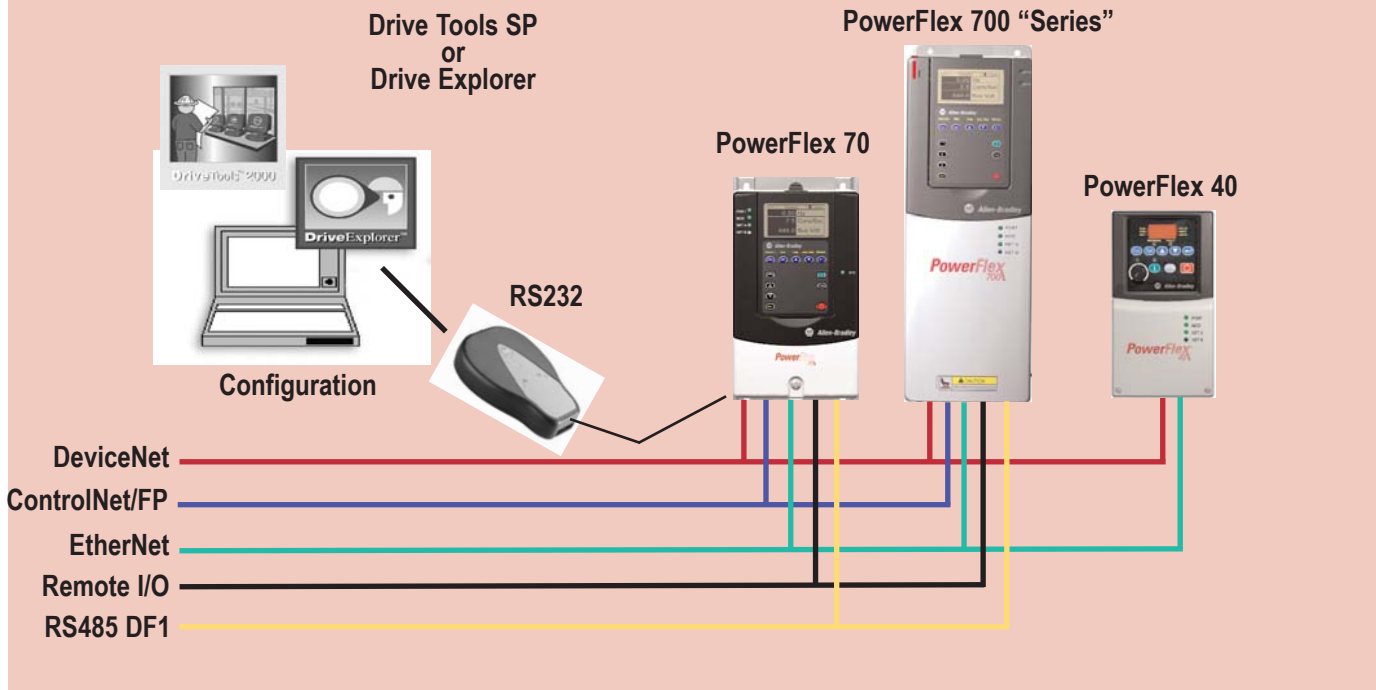
- High end power range, 1300-6770 kW
- 2400 to 6600V nominal supply voltage ratings
- Closed loop liquid cooling system with liquid to air or liquid to liquid style heat exchangers
- Small integrated package for high end power range
- Normal duty service rating (for variable torque loads, 110% overload for 1 minute every 10 minutes)
- Heavy duty service rating (for constant torque loads, 150% overload for 1 minute every 10 minutes)
- Two rectifier types:
 - 1) PWM rectifier (active front end) for low line harmonics, high power factor and commonality of parts
 - 2) 18 Pulse rectifier for low line harmonics and connection to a high voltage distribution system
- 3 Cables in / 3 cables out (6 pulse and PWM rectifier)
- 9 Cables in / 3 cables out (18 pulse rectifier)

PowerFlex Connectivity

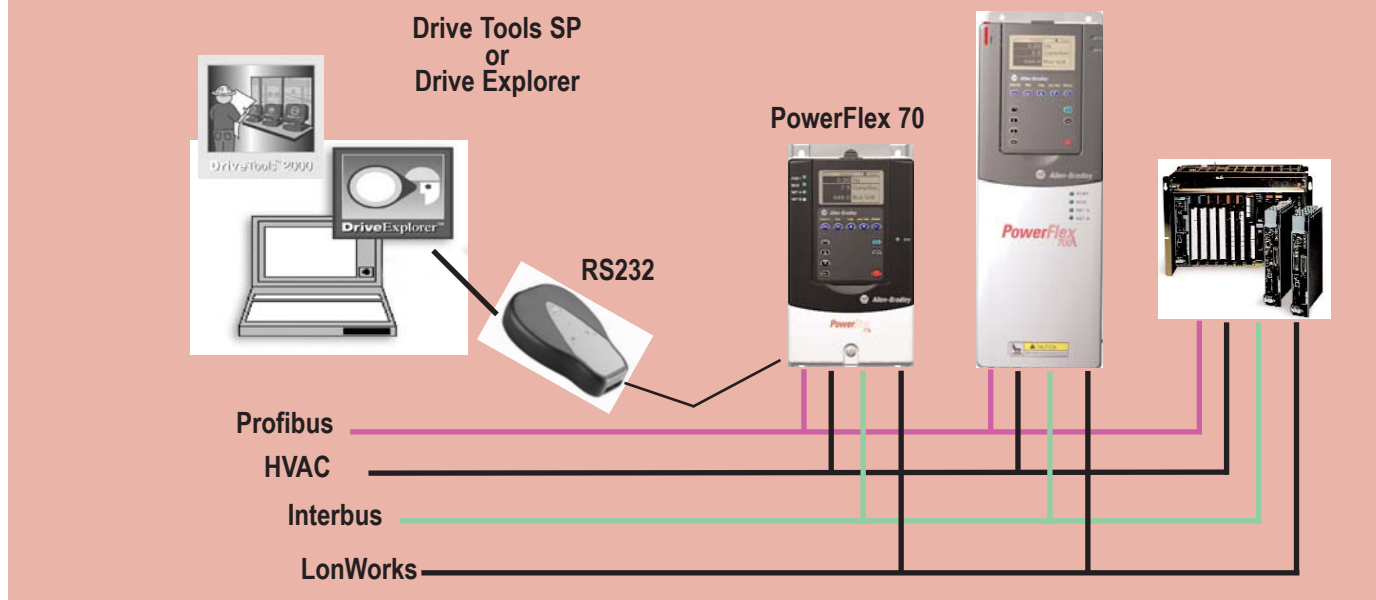
PowerFlex 40 Multi-drive solution



Core & Legacy Networks



Open Networks



PowerFlex Programming Devices

PowerFlex Programming Methods

- HIM's – Used for programming a single drive locally, a parameter at a time.
- DriveExplorer Software – an easy to use on-line tool, for uploading, downloading and changing drive parameters from your PC. DriveExplorer can connect to a drive serially with a Serial Converter Module, or across the top of the core networks (DeviceNet, ControlNet and EtherNet/IP).
- DriveTools SP – is a family of tools designed to accommodate demanding user requirements. It can be used on/off-line with the RSLinx communication software, to route through the core networks to the drive.



DriveTools SP consists of:

- DriveExecutive – Drive setup, parameter configuration, up/download.
- DriveObserver – charting of multiple drive parameters over time.



PowerFlex Communications Options

Catalog No. PF40	Catalog No. PF70/700	Description
22-COMM-D	20-COMM-D	DeviceNet Communications Module
22-COMM-E	20-COMM-E	EtherNet/IP Communication module
22-COMM-P	20-COMM-P	Profibus DP Communication Module
	20-COMM-H	HVAC Communication Module with 3 selectable protocols for Modbus RTU, Johnson Controls Metasys N2, Siemens Building Technologies P1
	20-COMM-I	InterBus Communication Module
	20-COMM-L	LonWorks Communication Module
	20-COMM-R	Remote I/O Communications Module
	20-COMM-S	Serial Cummunicaiton Module RS485 DF1
	20-COMM-C	ControlNet Communications Module
	20-COMM-K	CANopen Communications Module
22-XCOMM-DC-BASE	20-XCOMM-DC-BASE	External Communications Power bases
	1203-SSS	Serial Converter Module RS232 to DPI
22-SCM-232		Serial Converter Module RS232 to RS485
AK-U0-RJ45-SC1		RJ45 one to two port splitter cable
AK-U0-RJ45-TR1		RJ45 120 OHM terminator resistors (2 pieces)
AK-U0-RJ45-TB2P		RJ45 two positions terminal block
1769-SM 2	1769-SM 1	Compact Logix to DSI or DPI

PowerFlex Software Options

Catalog No.	Description
9306-4EXP02ENE	Drive Explorer™ Version 4.x
9306-4PXP01ENE	Pocket Drive Explorer
9303-4DTE01ENE	Drive Executive Version 4.x
9303-4DTS01ENE	DriveTools SP Suite - includes DriveExecutive and DriveObserver
9303-4DTE2S01ENE	DriveTools SP Suite Upgrade from DriveExecutive
9357-DNETL3	RS Networx for DeviceNet

PowerFlex Communication Adapters



PowerFlex DPI Communication Adapters 20-COMM-x

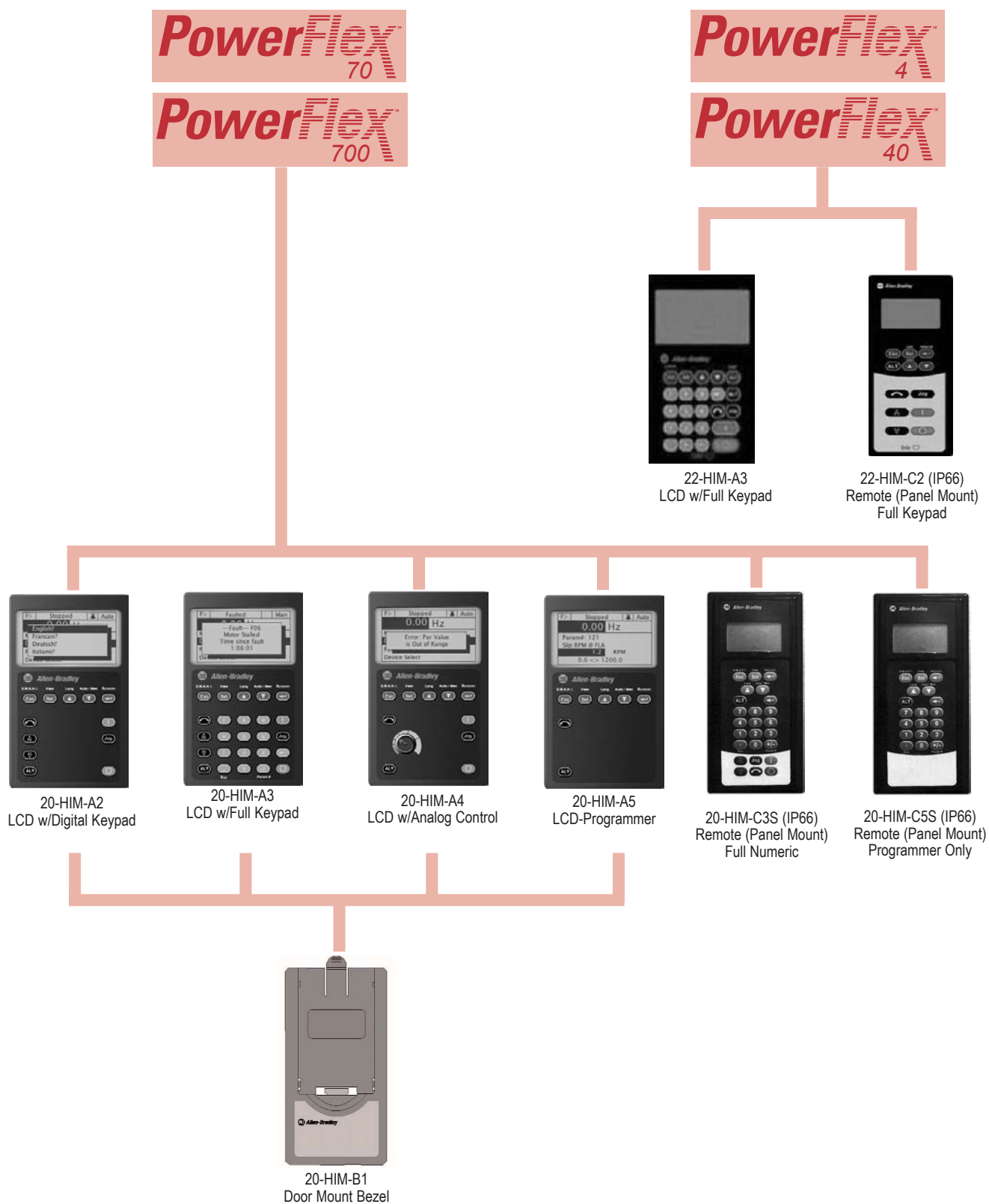
- Use with PowerFlex 70, 700, 700H, 700S, 7000
- Use Logic, Reference, Status, Feedback words to control the drive
- Use Data Links to transfer up to 8 further parameters in real time
- Support explicit messaging
- Peer to peer messaging (DeviceNet, EtherNet/IP only)
- Selectable communication fault actions



PowerFlex DSI Communication Adapters 22-COMM-x

- Use with PowerFlex 40 only – Use as single drive on network or as host for multiple drives (see page 18)
- Use Logic, Reference, Status, Feedback words to control the drive
- Support explicit messaging to transfer additional drive parameters
- Selectable communication fault actions

Human Interface Modules



PowerFlex 70/700 External EMC Filters

PowerFlex 70 and PowerFlex 700/700S with integrated EMC filters are compatible with EN61800-3. PowerFlex 70 Drives will meet “First Environment Restricted Distribution” but to 12 meters motor cable length, while PowerFlex 700 will meet “Second Environment Restricted Distribution”. Details for PowerFlex 70/700 see Instruction Manual.

To meet “First Environment Restricted or Unrestricted Distribution” or to increase the motor cable lengths external EMC filters are required. Drives passed test with Schaffner and Deltron filters. The table below is providing the information which EMC filter will meet which requirement at what motor cable length.

Max. Motor cable length to meet EN61800-3 “First Environment”

			Schaffner Filter FN3258		Deltron Filter KMF-A	
	Frame	Comment	First Env. Restr. Distrib.	First Env. Unrestr. Distrib.	First Env. Restr. Distrib.	First Env. Unrestr. Distr
PowerFlex 70	A		50m	50m	25m	25m
	B	Without Filter	100m	50m	50m	25m
	B	With Filter	100m	100m	100m	50m
	C		150m	150m	150m	150m
	D				150m	5m
	D	W/o (JP3A-B)*		150m	150m	50m
PowerFlex 700/700S	0		150m	150m	100m	100m
	1		150m	150m	150m	150m
	2		50m	50m	150m	150m
	2		150m	150m	150m	150m
	3		100m	100m	150m	100m
	3		150m	150m	150m	100m
	4		150m	150m	N/A	N/A
	5		150m	150m	N/A	N/A
	6		150m	50m	N/A	N/A

*Jumper for disconnecting the common mode capacitor (open jumper). Use of these filters assumes that the drive is mounted in an EMC enclosure.

Schaffner and Deltron EMC Filter Selection

SCHAFFNER

FN 3258

Articles in PeopleSoft and available from stock



PowerFlex 70				Schaffner Filters FN 3258			Deltron Filters KMF-A		
Frame	Power	Current	Cat.Number	Article	Current	Dimensions	Article	Current	Dimensions
	kW	A			At 50°C	HxWxD (mm)		At 50°C	HxWxD (mm)
A/B	0.37	1.3	20AC1P3...	FN3258-7/45	7	190x40x70	KMF306A	5.4	179x45x79
A/B	0.75	2.1	20AC2P1...	FN3258-7/45	7	190x40x70	KMF306A	5.4	179x45x79
A/B	1.5	3.5	20AC3P5...	FN3258-7/45	7	190x40x70	KMF306A	5.4	179x45x79
B	2.2	5	20AC5P0...	FN3258-7/45	7	190x40x70	KMF306A	5.4	179x45x79
B	4	8.7	20AC8P7...	FN3258-16/45	16	250x45x70	KMF310A	9	179x45x79
C	5.5	11	20AC011...	FN3258-16/45	16	250x45x70	KMF318A	16.1	229x88x114
C	7.5	15	20AC015...	FN3258-16/45	16	250x45x70	KMF318A	16.1	229x88x114
D	11	22	20AC022...	FN3258-30/47	30	270x50x85	KMF325A	22.4	229x88x114
D	15	30	20AC030...	FN3258-30/47	30	270x50x85	KMF336A	32.2	272x74x161
D	18.5	37	20AC037...	FN3258-42/47	42	310x50x85	KMF350A	44.8	312x93x190
D	22	43	20AC043...	FN3258-55/52	55	250x85x90	KMF350A	44.5	312x93x190

PowerFlex 700				Schaffner Filters FN 3258			Deltron Filters KMF-A		
Frame	Power	Current		Article	Current	Dimensions	Article	Current	Dimensions
	kW	A			At 50°C	HxWxD (mm)		At 50°C	HxWxD (mm)
0	0.75	2.1	20BC2P1...	FN3258-7/45	7	190x40x70	KMF306A	5.4	179x45x79
0	1.5	3.5	20BC3P5...	FN3258-7/45	7	190x40x70	KMF306A	5.4	179x45x79
0	2.2	5	20BC5P0...	FN3258-7/45	7	190x40x70	KMF306A	5.4	179x45x79
0	4	8.7	20BC8P7...	FN3258-16/45	16	250x45x70	KMF310A	9	179x45x79
0	5.5	11	20BC011...	FN3258-16/45	16	250x45x70	KMF318A	16.1	229x55x114
1	7.5	15	20BC015...	FN3258-16/45	16	250x45x70	KMF318A	16.1	229x55x114
1	11	22	20BC022...	FN3258-30/47	30	270x50x85	KMF325A	22.4	229x55x114
2	15	30	20BC030...	FN3258-30/47	30	270x50x85	KMF336A	32.2	272x74x161
2	18.5	37	20BC037...	FN3258-42/47	42	310x50x85	KMF350A	44.8	312x93x190
3	22	43	20BC043...	FN3258-55/52	55	250x85x90	KMF350A	44.8	312x93x190
3	30	56	20BC056...	FN3258-75/52	75	270x80x135	KMF370A	62.7	312x93x190
3	37	72	20BC072...	FN3258-75/52	75	270x80x135	KMF3100A	84.1	312x126x224
4	45	85	20BC085...	FN3258-100/35	100	270x90x150	KMF3100A	84.1	312x126x224
5	55	105	20BC105...	FN3258-130/35	130	270x90x150	KMF3150A	126	312x126x224
5	75	140	20BC140...	FN3258-180/40	180	380x120x170	KMF3150A	126	312x126x224
6	90	170	20BC170...	FN3258-180/40	180	380x120x170			
6	110	205	20BC205...	FN258-250/40	250	478x440x240			
6	132	260	20BC260...	FN258-250/40	① 280	478x440x240			

① At 40°C

Note:

- The filters have also a 40°C rating. In some cases it will be possible to select a smaller filter.
- The filters are available from stock
- The filters are C-UL certified
- To know more about Deltron-Emcon go to www.deltron-emcon.com
- To know more about Schaffner go to www.schaffner.com

PowerFlex Line Reactors

Input and Output Line Reactor

Typical Motor Rating		PowerFlex 4	PowerFlex 40	PowerFlex 70	PowerFlex 700	Line Choke 3% Impedance Catalog Number
kW	A					
200-240V, 3 Phase						
0.25	1.3	22A-B1P5...				1321-3R2-A
0.37	1.9	22A-B2P3...	22B-B2P3...			1321-3R4-D
0.75	3.3	22A-B4P5...	22B-B5P0...			1321-3R8-B
1.5	6.1	22A-B8P0...	22B-B8P0...			1321-3R8-A
2.2	8.9	22A-B012...	22B-B012...			1321-3R12-A
4	15.3	22A-B017...	22B-B017...			1321-3R18-A
5.5	21.0		22B-B024...			1321-3R25-A
7.5	28.0		22B-B033...			1321-3R35-A
400-480v, 3 Phase						
0.37	1.1	22A-D1P7...	22B-D1P4...	20AC1P3...	20BC1P3...	1321-3R2-B
0.75	1.9	22A-D2P3...	22B-D2P3...	20AC2P1...	20BC2P1...	1321-3R2-B
1.5	3.5	22A-D4P0...	22B-D4P0...	20AC3P5...	20BC3P5...	1321-3R4-B
2.2	5.0	22A-D6P0...	22B-D6P0...	20AC5P0...	20BC5P0...	1321-3R4-B
4	8.4	22A-D8P7...	22B-D010...	20AC8P7...	20BC8P7...	1321-3R8-B
5.5	11.4		22B-D012...	20AC011...	20BC011...	1321-3R12-B
7.5	15.0		22B-D017...	20AC015...	20BC015...	1321-3R18-B
11	22.0		22B-D024...	20AC022...	20BC022...	1321-3R25-B
15	29.0			20AC030...	20BC030...	1321-3R35-B
18.5	34.0			20AC037...	20BC037...	1321-3R45-B
22	40.0			20AC043...	20BC040...	1321-3R45-B
30	53.0			20AC060...	20BC056...	1321-3R80-B
37	65.0			20AC072...	20BC072...	1321-3R80-B
45	75.0				20BC085...	1321-3R100-B
55	98.0				20BC105...	1321-3R130-B
75	132.0				20BC140...	1321-3R160-B
90	158.0				20BC170...	1321-3R160-B
110	184.0				20BC205...	1321-3R200-B
132	235.0				20BC260...	1321-3RB320-B

Note: Technical details Line Reactors see Publication 1321-TD001D-EN-P

Line Input Contactors and Circuit Breakers

The Allen-Bradley wide portfolio of automation and control products allows you the option to select an appropriate item of control gear for the input protection and isolation of the drive.

Please find in the tables below the matched motor protective circuit breaker and the range of input contactors for each of the PowerFlex 4, 40 70 and 700 product lines.

Typical Motor Rating		PowerFlex 4			PowerFlex 40		
kW	Amps	Catalog No.	Circuit Breaker	Contactor	Catalog No.	Circuit Breaker	Contactor
		230V AC 1-Phase					
0.25	1.3	22A-A1P5N104	140M-C2E-B40	100-C09	22B-A1P5N104	140M-C2E-B40	100-C09
0.37	1.9	22A-A2P3N104	140M-C2E-B63	100-C09	22B-A2P3N104	140M-C2E-B63	100-C09
0.75	3.3	22A-A4P5N104	140M-C2E-C16	100-C12	22B-A4P5N104	140M-C2E-C16	100-C12
1.5	6.1	22A-A8P0N104	140M-D8E-C20	100-C23	22B-A8P0N104	140M-D8E-C20	100-C23
		400V AC 3-Phase					
0.37	1.1	22A-D1P4N104	140M-C2E-B25	100-C09	22B-D1P4N104	140M-C2E-B25	100-C09
0.75	1.9	22A-D2P3N104	140M-C2E-B40	100-C09	22B-D2P3N104	140M-C2E-B40	100-C09
1.5	3.5	22A-D4P0N104	140M-C2E-B63	100-C09	22B-D4P0N104	140M-C2E-B63	100-C09
2.2	5.0	22A-D6P0N104	140M-C2E-C10	100-C09	22B-D6P0N104	140M-C2E-C10	100-C09
4.0	8.4	22A-D8P7N104	140M-C2E-C16	100-C16	22B-D010N104	140M-C2E-C16	100-C23
5.5	11.4				22B-D012N104	140M-D8E-C20	100-C23
7.5	15.0				22B-D017N104	140M-D8E-C20	100-C23
11	22.0				22B-D024N104	140M-F8E-C32	100-C30

Typical Motor Rating		PowerFlex 70			PowerFlex 700/700S		
kW	Amps	Catalogue No.	Circuit Breaker	Contactor	Catalog No.	Circuit Breaker	Contactor
		400V AC 3-Phase			400V AC 3-Phase		
0.37	1.1	20AC1P3...	140M-C2E-B25	100-C09			
0.75	1.9	20AC2P1...	140M-C2E-B40	100-C09	20BC2P1...	140M-C2E-B40	100-C09
1.5	3.5	20AC3P5...	140M-C2E-B63	100-C09	20BC3P5...	140M-C2E-B40	100-C09
2.2	5.0	20AC5P0...	140M-C2E-C10	100-C09	20BC5P0...	140M-C2E-B63	100-C09
4	8.4	20AC8P7...	140M-C2E-C16	100-C16	20BC8P7...	140M-C2E-C10	100-C10
5.5	11.4	20AC011...	140M-C2E-C16	100-C16	20BC011...	140M-C2E-C16	100-C16
7.5	15.0	20AC015...	140M-D8E-C20	100-C23	20BC015...	140M-D8E-C20	100-C23
11	22.0	20AC022...	140M-F8E-C32	100-C30	20BC022...	140M-F8E-C32	100-C30
15	29.0	20AC030...	140M-F8E-C45	100-C37	20BC030...	140M-F8E-C45	100-C37
18.5	34.0	20AC037...	140MF8E-C45	100-C43	20BC037...	140M-F8E-C45	100-C43
22	40.0	20AC040...	140MF8E-C45	100-C43	20BC040...	140M-F8E-C45	100-C43
30	53.0	20AC060...	140CMN-6300	100-C60	20BC056...	140-CMN-6300	100-C60
37	65.0	20AC072...	140CMB-9000	100-C72	20BC072...	140-CMB-9000	100-C72
45	78.0				20BC085...	140-CMN-9000	100-C85
55	98.0				20BC105...	140M-K5F-D12	CAB6-105
75	132.0				20BC140...	140M-K5F-D16	CAB6-140
90	158.0				20BC170...	140M-M5F-D20	CAB6-210
110	194.0				20BC205...	140M-M5F-D25	CAB6-250
132	235.0				20BC260...	140M-P5F-D32	CAB6-250



- The 140M provides Type 2 coordination between the circuit breaker and contactor at 50kA
- 100 – C Coil connections can be top or bottom position on contactor
- 140M circuit breaker has a «trip position» incorporated within the handle

External Brake Resistors

When the internal resistor cannot provide the required braking capability an external resistor is required.

The internal dynamic brake IGBT will be damaged if the resistance value of the resistor bank is less than the minimum resistance value of the drive. Use Table below to verify that the resistance value of the selected resistor bank is greater than the minimum resistance of the drive.

Drive Rating (Normal Duty)	Motor kW	Minimum Resistance (With 10% Tolerance)			
		PF4	PF40	PF70	PF700
400 & 480V, 0.37kW (0.5HP)	0.37			68	
400 & 480V, 0.75kW (1HP)	0.75	121	97	68	71
400 & 480V, 1.5kW (2HP)	1.5	121	97	68	69
400 & 480V, 2.2kW (3HP)	2.2	97	97	68	69
400 & 480V, 4.0kW (5HP)	4.0	97	77	68	69
400 & 480V, 5.5kW (7.5HP)	5.5		55	74	70
400 & 480V, 7.5kW (10HP)	7.5		39	74	72
400 & 480V, 11.0kW (15HP)	11.0			44	45
400 & 480V, 15.0kW (20HP)	15.0			31	44
400 & 480V, 18.5kW (25HP)	18.5			31	31
400 & 480V, 22.0kW (30HP)	22.0			31	22
400 & 480V, 30.0kW (40HP)	30.0			19	18
400 & 480V, 37.0kW (50HP)	37.0			19	19
400 & 480V, 45.0kW (60HP)	45.0				20
400 & 480V, 55.0kW (75HP)	55.0				10.4
400 & 480V, 75kW (100HP)	75.0				10.1
400 & 480V, 90.0kW (125HP)	90.0				5.4
400 & 480V, 110.0kW (150HP)	110.0				4.8
400 & 480V, 132.0kW (150HP)	132.0				4.8
400 & 480V, 160.0kW (250HP)	160.0				3.25

Selection Frizlen Resistors

Catalog Number	Description	Dimensions HxWxD	Weight kg
FZG 600x65-82	Dynamic Brake Resistor, 380-480V, 82 Ohm, 1kW, IP20	686x92x120	3.4
FZZG 600x65-82	Dynamic Brake Resistor, 380-480V, 82 Ohm, 2kW, IP20	686x185x120	6.2
FZGQ 600x65-82	Dynamic Brake Resistor, 380-480V, 82 Ohm, 1kW, Klixon, IP20	686x92x120	3.4
FZZGQ 600x65-82	Dynamic Brake Resistor, 380-480V, 82 Ohm, 2kW, Klixon, IP20	686x185x120	6.2
FZDGQ 600x65-47	Dynamic Brake Resistor, 380-480V, 47 Ohm, 3kW, Klixon, IP20	686x185x120	6.2
FGF3100904-35	Dynamic Brake Resistor, 380-480V, 35 Ohm, 4.5kW, Klixon, IP20	490x330x270	9.5
FGFLQ3121604-32	Dynamic Brake Resistor, 380-480V, 32 Ohm, 8kW, Klixon, IP20	490x655x270	18
FGFLQ3122004-27	Dynamic Brake Resistor, 380-480V, 27 Ohm, 10kW, Klixon, IP20	490x655x270	20
FGFLQ3122404-20	Dynamic Brake Resistor, 380-480V, 20 Ohm, 12kW, Klixon, IP20	490x655x270	22
FGFLQ3133004-11	Dynamic Brake Resistor, 380-480V, 11 Ohm, 15kW, Klixon, IP20	490x855x270	31
FGFLQ3143604-10	Dynamic Brake Resistor, 380-480V, 10 Ohm, 18kW, Klixon, IP20	490x1055x270	40
FGFLQ3144404-5-3	Dynamic Brake Resistor, 380-480V, 5.3 Ohm, 22kW, Klixon, IP20	490x1055x270	44

Notes:

FZxxx : wire wound resistor

FGFxxx : steel grid resistor

The resistors are **not** UL certified

The resistors above are available from stock

To know more about Fritzlen go to www.fritzlen.com

Medium Duty External Brake Resistors

Catalog No.	Description
AK-R2-091P500	Dynamic Brake Resistor, 200-480V, 91Ohm, 86W
AK-R2-047P500	Dynamic Brake Resistor, 200-480V, 47Ohm, 166W
AK-R2-360P500	Dynamic Brake Resistor, 200-480V, 360Ohm, 86W
AK-R2-030P1K2	Dynamic Brake Resistor, 200-480V, 300Ohm, 260W
AK-R2-120P1K2	Dynamic Brake Resistor, 200-480V, 120Ohm, 260W

Drive and Motor Size kW (HP)	Part Number	Resistance Ohms at 5%	Continuous Power kW	Max Energy kJ	Max Braking Torque % of Motor	Application Type 1		Application Type 2	
						Braking Torque % of Motor	Duty Cycle %	Braking Torque % of motor	Duty Cycle %
100-120 Volt AC Input Drives									
0.75 (1)	AK-R2-091P500	91	0.086	17	218%	100%	23%	150%	31%
1.1 (1.5)	AK-R2-091P500	91	0.086	17	164%	100%	18%	148%	11%
200-240 Volt AC Input Drives									
0.37 (0.5)	AK-R2-091P500	91	0.086	17	293%	100%	46%	150%	31%
0.75 (1)	AK-R2-091P500	91	0.086	17	218%	100%	23%	150%	15%
1.5 (2)	AK-R2-091P500	91	0.086	17	109%	100%	11%	109%	11%
2.2 (3)	AK-R2-047P500	47	0.166	33	144%	100%	15%	144%	11%
4 (5)	AK-R2-047P500	47	0.166	33	79%	79%	11%	N/A	N/A
5.5 (7.5)	AK-R2-030P500	30	0.26	52	90%	90%	10%	N/A	N/A
7.5 (10)	AK-R2-030P500	30	0.26	52	66%	66%	10%	N/A	N/A
11 (15)	See Note 3	15	0.52	104	90%	90%	10%	N/A	N/A
15 (20)	See Note 3	15	0.52	104	66%	66%	10%	N/A	N/A
400-480 Volt AC Input Drives									
0.37 (0.5)	AK-R2-360P500	360	0.086	17	305%	100%	47%	150%	31%
0.75 (1)	AK-R2-360P500	360	0.086	17	220%	100%	23%	150%	15%
1.5 (2)	AK-R2-360P500	360	0.086	17	110%	100%	12%	110%	11%
2.2 (3)	AK-R2-120P1K2	120	0.26	52	197%	100%	24%	150%	16%
4 (5)	AK-R2-120P1K2	120	0.26	52	124	100%	13%	124%	10%
5.5 (7.5)	AK-R2-120P1K2	120	0.26	52	90%	90%	10%	N/A	N/A
7.5 (10)	AK-R2-120P1K2	120	0.26	52	66%	66%	10%	N/A	N/A
11 (15)	See Note 3	60	0.52	104	90%	90%	10%	N/A	N/A
15 (20)	See Note 3	60	0.52	104	66	66%	10%	N/A	N/A
600 Volt AC Input Drives									
0.37 (0.5)	AK-R2-360P500	360	0.086	17	274	100%	46	150	31
0.75 (1)	AK-R2-360P500	360	0.086	17	251	100%	23	150	15
1.5 (2)	AK-R2-360P500	360	0.086	17	172	100%	11	150	8
2.2 (3)	AK-R2-120P1K2	120	0.26	52	193	100%	24	150	16
4 (5)	AK-R2-120P1K2	120	0.26	52	185	100%	13	150	9
5.5 (7.5)	AK-R2-120P1K2	120	0.26	52	141	100%	9	141	7
7.5 (10)	AK-R2-120P1K2	120	0.26	52	103	100%	7	103	7
11 (15)	See Note 3	60	0.52	104	141	100%	9	141	7
15 (20)	See Note 3	60	0.52	104	103	100%	7	103	7

Note 1: Always check resistor ohms against minimum resistance for drive being used.

Note 2: Duty cycle listed is based on full speed to zero speed deceleration. For constant regeneration at full speed, duty cycle capability is half of what is listed.

Application Type 1 represents maximum capability up to 100% braking torque where possible.

Application Type 2 represents more than 100% braking torque where possible, up to maximum of 150%.

Note 3: For 11 and 15kW (15 and 20HP) normal duty external resistor applications, use two 7.5kW (10HP) size resistors wired in parallel.

Note:

- The resistors are CE and cUR certified
- For more information about external resistors see PowerFlex Publication: PFLEX-AT001F-EN-P, (Appendix A) or PowerFlex40 User Manual 22B-UM001C-EN-P (Appendix B) on www.rockwellautomation.com

www.rockwellautomation.com

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