

Kinetix 7000 Servo Drive Components

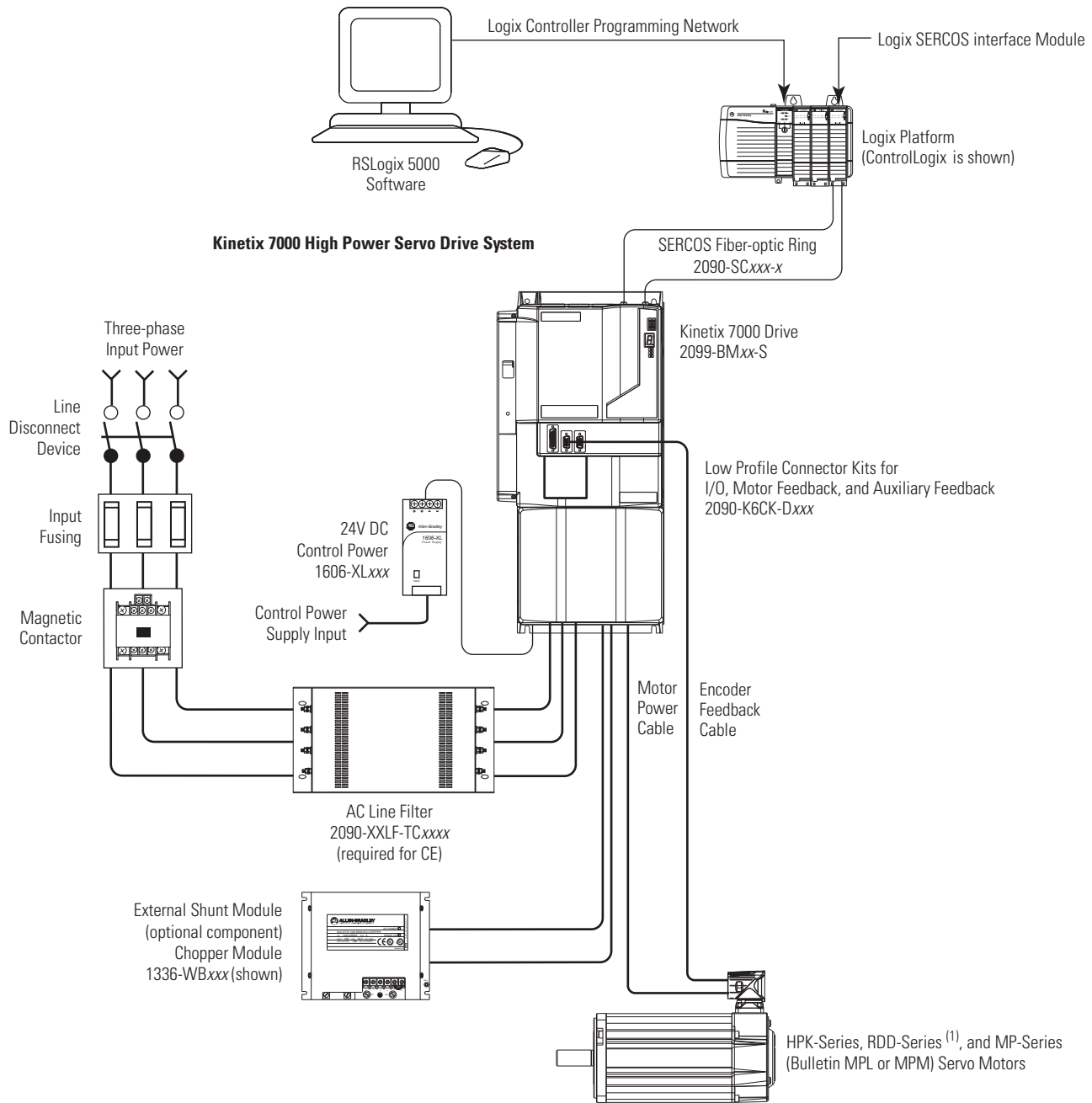
Kinetix 7000 Servo Drive systems consist of these required components:

- One Kinetix 7000 high power drive, 2099-BMxx-S
- One HPK-Series, MP-Series (Bulletin MPL or Bulletin MPM), or RDD-Series motor. RDD-Series motors require the 2090-K7CK-KENDAT low-profile feedback module, all others require the 2090-K6CK-D15M low-profile connector kit for flying-lead feedback cables.
- One motor power and feedback cable
- Two SERCOS fiber-optic cables, 2090-SCxxx-x

Kinetix 7000 systems may also include any of these optional components:

- Bulletin 8720MC Regenerative Power Supply (RPS), 8720MC-RPSxxx (DC common bus operation) with harmonic filter and varistor
- Bulletin 8720MC-LRxx-xxxx line reactor
- Bulletin 1336-MOD-KBxxx external active shunt module (dynamic brake)
- Bulletin 1336-WBxxx brake chopper module
- Bulletin 2094-BL75S (460V) Line Interface Module (LIM)

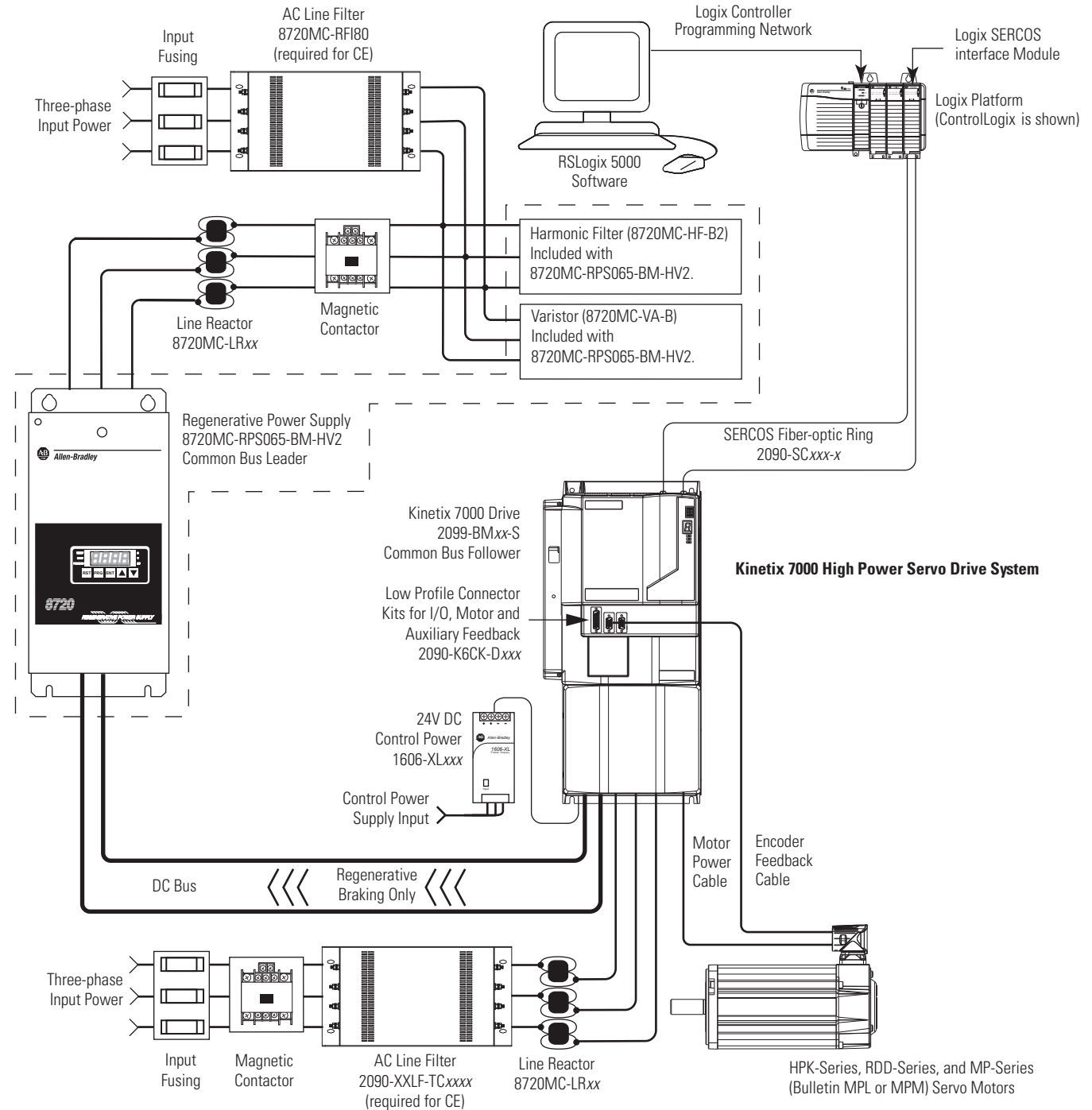
Typical Configuration - Kinetix 7000 (AC input) System (without LIM module)



(1) RDD-Series direct-drive motors require the 2090-K7CK-KENDAT low-profile feedback module for Kinetix 7000 drive applications.

In the figure below, the Kinetix 7000 drive system is shown with the 8720MC Regenerative Power Supply (RPS) in a regenerative braking configuration. Harmonic filter and varistor are available separately, but are included with the RPS unit when ordering catalog number 8720MC-RPS065-BM-HV2. In this configuration, the Kinetix 7000 drive provides motoring power and the RPS unit provides regenerative braking.

Typical Configuration - Kinetix 7000 (AC input) System (with regenerative braking)

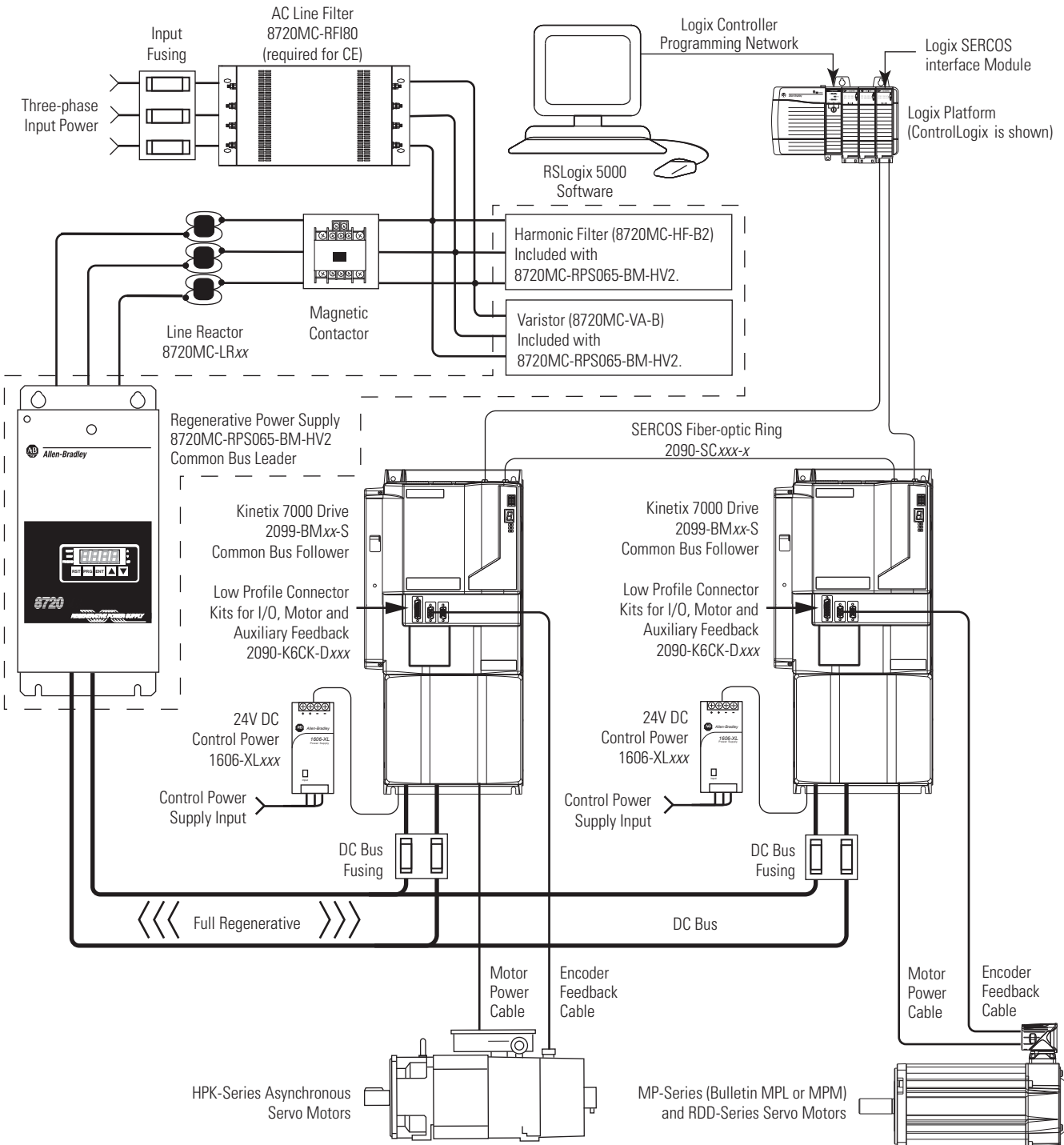


IMPORTANT Regenerative braking applications are limited to only one Kinetix 7000 common bus follower drive.

In the figure below, the Kinetix 7000 drive system is shown with the 8720MC Regenerative Power Supply (RPS) in DC common bus configuration with two follower Kinetix 7000 drives. Harmonic filter and varistor are available separately, but are included with the when ordering the 8720MC-RPS065-BM-HV2 RPS unit.

In Full-line Regenerative mode the 8720MC-RPS065 unit provides motoring power and regenerative braking.

Typical Configuration - Kinetix 7000 (DC input from RPS unit) System (with full-line regeneration)



Kinetix 7000 High Power Drive Specifications

This section contains specifications, mounting dimensions, and catalog numbers for the Kinetix 7000 (2099-BMxx-S) drives.

Power Specifications

Attribute	Value						
	2099-BM06-S	2099-BM07-S	2099-BM08-S	2099-BM09-S	2099-BM10-S	2099-BM11-S	2099-BM12-S
AC input voltage	342...528V AC rms three-phase (380...480V nom)						
AC input frequency	47...63 Hz						
Bandwidth ⁽¹⁾ Velocity loop Current loop	500 Hz 1300 Hz						500 Hz 500 Hz
PWM frequency	4 kHz						2 kHz
Main AC input current Nom (rms) Max inrush (A peak)	36.7 A 18.0 A	47.7 A 18.0 A	59.6 A 18.0 A	90.1 A 96.0 A	117 A 118 A	169 A 141 A	233 A 141 A
DC input voltage	450...750V DC						
DC input current	42.9 A	55.7 A	69.7 A	105 A	137 A	204 A	281 A
Control power input Voltage	18...30V DC (24V DC, nom)						
Control power DC input current Nom (rms) Maximum inrush (rms)	3.3 A 6.0 A						
Continuous output current (rms)	40.0 A	52.0 A	65.0 A	96.0 A	125 A	180 A	248 A
Continuous output current (0-pk)	56.0 A	73.0 A	92.0 A	135 A	176 A	254 A	351 A
Peak output current (rms) 3 s duration 60 s duration	68.0 A 51.0 A	80.0 A 60.0 A	104 A 78.0A	154 A 115 A	163 A 138 A	312 A 234 A	372 A 273 A
Peak output current (0-pk) 3 s duration 60 s duration	96.0 A 72.0 A	113 A 84.8 A	147 A 110 A	217.7 A 162.6 A	230.5 A 195 A	441 A 331 A	526 A 386 A
Bus overvoltage	800V DC						
Bus undervoltage	275...560V DC ⁽²⁾						
Continuous power output, nom	22 kW	30 kW	37 kW	56 kW	75 kW	112 kW	149 kW
Continuous power output (Hp)	30 Hp	40 Hp	50 Hp	75 Hp	100 Hp	150 Hp	200 Hp
Maximum power cycles/minute AC line DC bus	4 per minute (pre-charge provided by drive) 2 per minute (DC pre-charge provided by the regenerative power supply)						
DC bus discharge time	3 minutes after removal of main AC power						
Efficiency	97.5%						
Total capacitance ⁽³⁾	1800 µF	2400 µF	3000 µF	4500 µF	6000 µF	8400 µF	8400 µF
Short circuit current rating	200,000 A (rms) symmetrical						

(1) Bandwidth values vary based on tuning parameters and mechanical components.

(2) Bus undervoltage will vary based on input line voltage.

(3) If DC input is supplied to 2099-BM09-S, 2099-BM10-S, or 2099-BM11-S drives, the precharge capability must be provided at the system level. Disconnect switches must not be used between the input of the drive and a common DC bus without the use of an external precharge device.

Circuit Breaker/Fuse Specifications

While circuit breakers offer some convenience, there are limitations for their use. Circuit breakers do not handle high current inrush as well as fuses.

Make sure the selected components are properly coordinated and meet acceptable codes including any requirements for branch circuit protection. Evaluation of the short-circuit available current is critical and must be kept below the short-circuit current rating of the circuit breaker.

Use class CC, T, RK1, or J fuses, with current rating as indicated in the table below. The following fuse examples and short-circuit current ratings are recommended for use with the 2099-BMxx-S drives when the Line Interface Module (LIM) is not used.

IMPORTANT

LIM modules (catalog numbers 2094-BLxxS and 2094-XL75S-Cx) provide branch circuit protection to the Kinetix 7000 drive. Follow all applicable NEC and local codes.

Fuse Specifications

Drive Cat. No.	Bussmann Fuse	Dual Element Time Delay Fuse (min/max) A rms	Non-Time Delay Fuse (min/max) A rms	Motor Circuit Protector (max) A rms
2099-BM06-S	LPJ-90SP	50/90	50/150	50
2099-BM07-S	LPJ-110SP	60/110	60/200	70
2099-BM08-S	LPJ-125SP	80/125	80/250	100
2099-BM09-S	LPJ-200SP	125/200	125/300	125
2099-BM10-S	LPJ-250SP	150/250	150/500	150
2099-BM11-S	LPJ-400SP	225/400	225/600	250
2099-BM12-S	LPJ-500SP	300/550	300/700	400

Contactors Ratings

The table below lists the recommended contactor ratings for Kinetix 7000 drives installed without a Line Interface Module.

Drive Cat. No.	Contactors	Safety Contactors	Coil Type	Coil Voltage Requirements
2099-BM06-S	100-C43DJ01	100S-C43-DJD4C	Standard with Diode	24V DC
2099-BM07-S	100-D95EN11	100S-D95EN22C	Electronic Coil ⁽¹⁾	24V DC for control and 480V AC for coil power
2099-BM08-S				
2099-BM09-S				
2099-BM10-S	100-D140EN11	100S-D140EN22C		
2099-BM11-S	100-D180EN11	100S-D180EN22C		
2099-BM12-S	100-D250EN11	100S-D250EN22C		

(1) Electronic coil control power requirements = 24V DC @ 15 mA.

Motor/Actuator Cable Selection

These tables provide flying-lead motor cable catalog numbers for drive/motor combinations. Most motor brake wires are in the power cable, so a separate brake cable is not required (except where noted).

IMPORTANT

The MP-Series low-inertia motors on this page are equipped with DIN connectors (specified by 4 or 7 in the catalog number) and are not compatible with cables designed for motors equipped with bayonet connectors (specified by 2 in the catalog number). The motors with bayonet connectors (for example, MPL-A310P-xx2xAA) are being discontinued and require 2090-XXNFMP-Sxx (bayonet) cables. For help with migration or to select bayonet cables, contact your Rockwell Automation sales representative.

MP-Series (Bulletin MPL) Motor Feedback Cables

Motor Cat. No.	Compatible Drive Cat. No.	Feedback Type	Feedback Cable Cat. No.
MPL-A15xxx-V/Ex4xAA, MPL-A2xxx-V/Ex4xAA	2093-AC05-MP _x or 2093-AM _{xx} 2094-AC _{xx} -M _{xx} -S or 2094-AM _{xx} -S 2097-V3 _{xxxx} 2098-DSD- _{xxx}	Multi-turn High-resolution Absolute or Single-turn High-resolution Encoder Feedback	2090-XXNFMF-S _{xx} (standard) 2090-CFBM4DF-CDAF _{xx} (continuous-flex)
MPL-B15xxx-V/Ex4xAA, MPL-B2xxx-V/Ex4xAA	2094-BC _{xx} -M _{xx} -S or 2094-BM _{xx} -S 2097-V3 _{xxxx} 2098-DSD-HV _{xxx}		
MPL-A3xxx-M/Sx7xAA, MPL-A5xxx-M/Sx7xAA	2093-AC05-MP _x or 2093-AM _{xx} 2094-AC _{xx} -M _{xx} -S or 2094-AM _{xx} -S 2097-V3 _{xxxx} 2098-DSD- _{xxx} 2098-IPD- _{xxx}	Multi-turn High-resolution Absolute or Single-turn High-resolution Encoder Feedback	2090-XXNFMF-S _{xx} (standard) 2090-CFBM7DF-CDAF _{xx} (continuous-flex)
MPL-B3xxx-M/Sx7xAA, MPL-B9xxx-M/Sx7xAA	2094-BC _{xx} -M _{xx} -S or 2094-BM _{xx} -S 2097-V3 _{xxxx} 2098-DSD-HV _{xxx} 2098-IPD-HV _{xxx} 2099-BM _{xx} -S		
MPL-A15xxx-Hx4xAA, MPL-A2xxx-Hx4xAA	2093-AC05-MP _x or 2093-AM _{xx} 2094-AC _{xx} -M _{xx} -S or 2094-AM _{xx} -S 2097-V3 _{xxxx} 2098-DSD- _{xxx}	Incremental ⁽¹⁾ Feedback	2090-XXNFMF-S _{xx} (standard) 2090-CFBM4DF-CDAF _{xx} (continuous-flex)
MPL-B15xxx-Hx4xAA, MPL-B2xxx-Hx4xAA	2094-BC _{xx} -M _{xx} -S or 2094-BM _{xx} -S 2097-V3 _{xxxx} 2098-DSD-HV _{xxx}		
MPL-A3xxx-Hx7xAA, MPL-A4xxx-Hx7xAA, MPL-A45xxx-Hx7xAA	2093-AC05-MP _x or 2093-AM _{xx} 2094-AC _{xx} -M _{xx} -S or 2094-AM _{xx} -S 2097-V3 _{xxxx} 2098-DSD- _{xxx} 2098-IPD- _{xxx}		
MPL-B _{xxxx} -Rx4xAA	2094-BC _{xx} -M _{xx} -S or 2094-BM _{xx} -S	Resolver Feedback ⁽¹⁾	2090-CFBM4DF-CEAA _{xx} (standard)

(1) Not all MP-Series low-inertia motors are available with incremental and resolver feedback options.

Cable length *xx* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).