

Connector Sets

Kinetix 300 Drive Family

Module	Cat. No.	Description	Cat. No.
Kinetix 300 Drive	2097-V3xxx	Includes AC input (IPD), back-up power (CPD), shunt and DC bus (BC), motor power (MP), and safe-off (STO) replacement connectors for all Kinetix 300 drives.	2097-CONN1

Kinetix 6000, Kinetix 6200, Kinetix 6500 Drive Families

Module	Cat. No.	Description	Cat. No.
IAM Module (converter connectors)	2094-AC05-Mxx-S and 2094-AC09-M02-S	Includes control power (CPD), DC bus/AC input (IPD), and contactor enable (CED) replacement connectors for the IAM (converter).	2094-ANCON-1
	2094-AC16-M03-S and 2094-AC32-M05-S		2094-XNCON-2
	2094-BC01-Mxx-S and 2094-BC02-M02-S 2094-BC01-Mxx-M and 2094-BC02-M02-M		2094-BNCON-1
	2094-BC04-M03-S and 2094-BC07-M05-S		2094-XNCON-2
IAM/AM Module (inverter connectors)	2094-AC05-Mxx-S, 2094-AC09-M02-S, 2094-AMP5-S, 2094-AM01-S, 2094-AM02-S	Includes motor power (MP), motor/resistive brake (BC), and safe-off (SO), replacement connectors for the IAM (inverter) and AM. Also includes bracket kit for SERCOS fiber-optic cable connectors.	2094-XNINV-1
	2094-AC16-M03-S and 2094-AC32-M05-S 2094-AM03-S, 2094-AM05-S 2094-BC04-M03-S, 2094-BM03-S		2094-ANINV-2
	2094-BC01-Mxx-S and 2094-BC02-M02-S 2094-BC01-Mxx-S and 2094-BC02-M02-M 2094-BMP5-M, 2094-BM01-M, 2094-BM02-S 2094-BMP5-M, 2094-BM01-M, 2094-BM02-M		2094-XNINV-1
	2094-BC07-M05-S, 2094-BM05-S		2094-BNINV-2
Shunt Module	2094-BSP2	Includes external shunt resistor (RC) and external thermal switch (TS) replacement connectors for the SM.	2094-XNSHT-1

Kinetix 7000 Drive Family

Module	Cat. No.	Description	Cat. No.
Kinetix 7000 Drive	2099-BMxx-S	Includes safe-off (SO), general purpose I/O (GPIO), general purpose relay (GPR), and control power (CP) replacement connectors for Kinetix 7000 drives.	2099-K7KCK-1

Line Interface Module (LIM) and Resistive Brake Module (RBM)

Module	Cat. No.	Description	Cat. No.
Line Interface Module (LIM)	2094-AL09 and 2094-BL02	Includes VAC line (IPL), VAC load (OPL), control power (CPL), and 24V brake power (PSL) replacement connectors.	2094-XNLIM-1
Line Interface Module (LIM)	2094-ALxxS, 2094-BLxxS, and 2094-XL75S-Cx	Includes I/O (IOL), VAC line (IPL), VAC load (OPL), control power (CPL), 230V auxiliary output (P2L), 24V brake power (P1L), and 230V auxiliary input (APL) replacement connectors.	2094-XNLIM-2
Resistive Brake Module (RBM)	2090-XB33-xx	Includes I/O connector (TB3), drive connector (TB1), and motor connector (TB2).	2090-XNRBM-1
	2090-XB120-xx	Includes I/O connector (TB3), 230V input power connector (TB4), drive connector (TB1), and motor connector (TB2).	2090-XNRBM-2

Kinetix 6000 systems may also include any of these optional components:

- One or more integrated axis modules used as follower IAM, 2094-ACxx-Mxx-S (230V) or 2094-BCxx-Mxx-S (460V) and associated axis modules, power rails, motors, and cables as required for the application
- One shunt module, 2094-BSP2 with optional Bulletin 1394 external passive shunt module
- Slot-filler modules, 2094-PRF
- Bulletin 2094 Line Interface Module (LIM)
- Bulletin 2090 Resistive Brake Module (RBM)
- Bulletin 1336 external active shunt module (dynamic brake)

Kinetix 6000 IAM/AM Module Series Change

The peak current ratings of the Kinetix 6000 AM modules (series A and B) are configured at the factory as 150% of continuous current. You can program 460V (series B) AM modules and the equivalent IAM (inverter) modules, for up to 250% of continuous inverter current.

Kinetix 6000 Series Change

IAM Module ⁽¹⁾ Cat. No.	AM Module ⁽¹⁾ Cat. No.	Peak Current Rating	
		Series A (inverter)	Series B (inverter)
2094-BC01-MP5-S	2094-BMP5-S	150%	250%
2094-BC01-M01-S	2094-BM01-S	150%	250%
2094-BC02-M02-S	2094-BM02-S	150%	250%

(1) Contact your Rockwell Automation sales representative for availability of 2094-BC04-M03-S, 2094-BM03-S, 2094-BC07-M05-S, and 2094-BM05-S series-B drive modules.

IMPORTANT

Before your drive will deliver 250% peak performance, you must enable the peak enhancement feature by configuring your drive by using DriveExplorer or RSLogix 5000 software.

Refer to the interactive Peak Enhancement Configuration Utility to recalculate torque and accel/decel limit values, and paste them into the appropriate Axis Properties dialog box in RSLogix 5000 software. To download the utility, go to <http://ab.com/motion/software/peak.html>.

For sizing your drive/motor combination by using series-B drives and the peak enhancement feature, use Motion Analyzer software, version 4.6 or later.

Peak Enhancement Specifications

Drives that support the Peak Enhanced mode have the capability of increasing the maximum inverter peak current to achieve greater overload performance.

IMPORTANT

The Peak Enhancement feature requires use of RSLogix 5000 software version 16 and drive firmware revision 1.111 or later.

Kinetix 6000 Peak Overload Support

IAM/AM Module Cat. No.	Module	Safe-off Drive	Series A	Series B
2094-BCxx-Mxx	IAM	Non safe-off	Standard	Standard
2094-BMxx	AM			
2094-BCxx-Mxx-S	IAM	Safe-off	Standard	Standard or Peak enhanced ⁽¹⁾
2094-BMxx-S	AM			

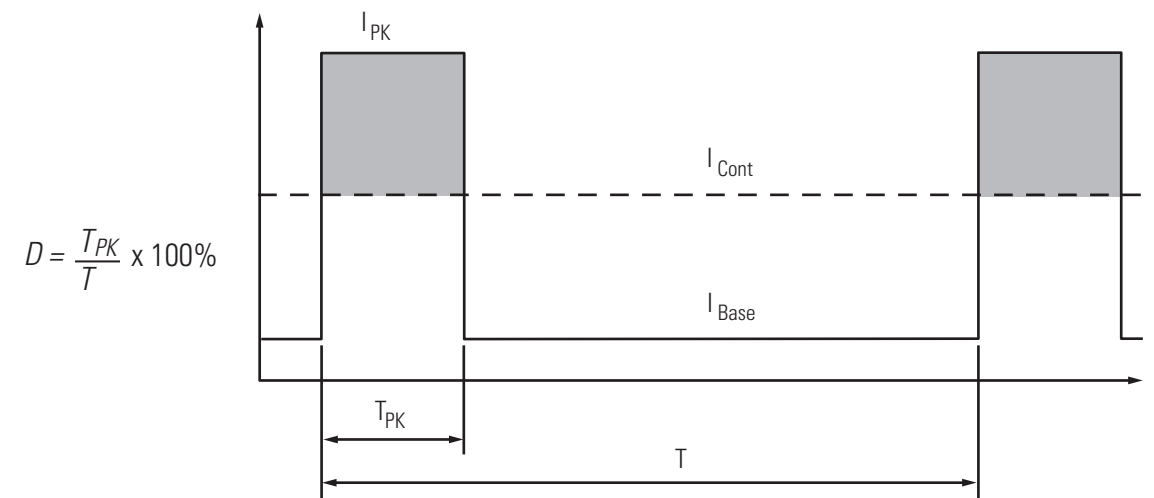
(1) Standard mode is enabled by default to preserve backward compatibility, but you can enable the Peak Enhanced mode to achieve increased peak current performance. Refer to Kinetix 6000 IAM/AM Module Series Change on [page 268](#) for information on enabling the Peak Enhanced mode.

Kinetix 6000 Peak Current Ratings

IAM/AM Module ⁽¹⁾ Cat. No.	Peak Inverter Current Rating		Peak Enhanced Converter Current Rating
	Standard	Peak Enhanced	
2094-BC01-MP5-S	150%	250%	250%
2094-BC01-M01-S	150%	250%	250%
2094-BC02-M02-S	150%	250%	250%
2094-BMP5-S	150%	250%	N/A
2094-BM01-S	150%	250%	N/A
2094-BM02-S	150%	250%	N/A

(1) Contact your Rockwell Automation sales representative for availability of 2094-BC04-M03-S, 2094-BM03-S, 2094-BC07-M05-S, and 2094-BM05-S series-B drive modules.

Load Duty-cycle Profile Example



IAM Module (460V) Power Specifications (series A and B)

Attribute	2094-BC01-MP5-S	2094-BC01-M01-S	2094-BC02-M02-S	2094-BC04-M03-S	2094-BC07-M05-S
AC input voltage	324...528V rms three-phase (360...480V nom)				
AC input frequency	47...63 Hz				
Main AC input current Nom (rms) Max inrush (0-pk) ⁽¹⁾	10.0 A 11.0 A	24.0 A 22.0 A	44.0 A 31.1 A	71.0 A 62.2 A	
DC input voltage (common bus follower)	458...747V DC				
DC input current (common-bus follower)	9.0 A	22.6 A	41.5 A	67.7 A	
Control power AC input voltage	95...264V rms single-phase (230V nom)				
Control power AC input current Nom (@ 220/230V AC) rms Nom (@ 110/115V AC) rms Max inrush (0-pk)	3 A 6 A 30 A ⁽²⁾				
Nominal bus output voltage	650V DC				
Line loss ride through	20 ms				
Continuous output current to bus (A_{dc})	9.0 A	22.6 A	41.5 A	67.7 A	
Peak output current to bus (A_{dc}) Series A drives ⁽³⁾ Series B drives ⁽⁴⁾	18.1 A ⁽³⁾ 22.6 A ⁽⁴⁾	45.2 A ⁽³⁾ 56.4 A ⁽⁴⁾	83.1 A ⁽³⁾	135.4 A ⁽³⁾	
Bus overvoltage	825V DC				
Bus undervoltage	275V DC				
Internal shunt Continuous power Peak power	50 W 5.6 kW		200 W 22.5 kW		
Internal shunt resistor	115 Ω		28.75 Ω		
Shunt on	805V DC				
Shunt off	755V DC				
Continuous power output to bus	6 kW	15 kW	27.6 kW	45 kW	
Peak power output Series A drives ⁽³⁾ Series B drives ⁽⁴⁾	12 kW ⁽³⁾ 15 kW ⁽⁴⁾	30 kW ⁽³⁾ 37.5 kW ⁽⁴⁾	55.2 kW ⁽³⁾	90 kW ⁽³⁾	
Efficiency	97%				
Converter inductance	500 μ H		125 μ H	75 μ H	
Converter capacitance	110 μ F	220 μ F	940 μ F	1410 μ F	
Short circuit current rating	200,000 A (rms) symmetrical				

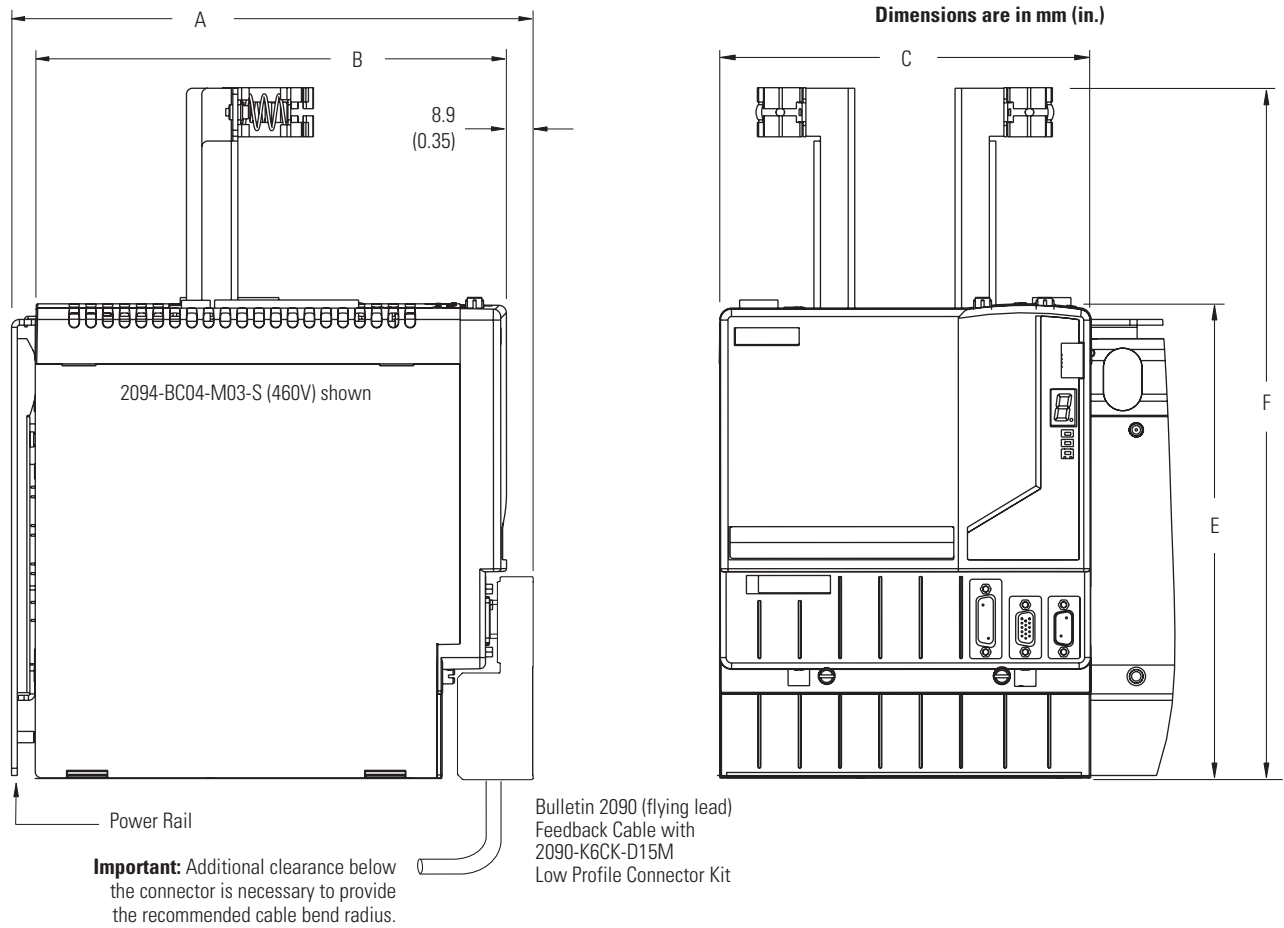
(1) All 2094-xCxx IAM modules are limited to 2 contactor cycles per minute (with up to 4 axis modules), or 1 contactor cycle per minute (with 5 to 8 axis modules).

(2) Maximum inrush duration is less than 1/2 line cycle.

(3) Peak output current duration equals 250 ms.

(4) Converter peak output duration equals 400 ms with a duty cycle of 16%.

2094-AC16-M03-S and 2094-AC32-M05-S Dimensions (230V)
2094-BC04-M03-S and 2094-BC07-M05-S Dimensions (460V)



Modules are shown mounted to the power rail and the dimensions reflect that in the depth of the module.

IAM Module Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	E mm (in.)	F mm (in.)
2094-AC16-M03-S	198 (7.8)	176 (7.0)	125 (4.9)	302 (11.9)	420 (16.5)
2094-AC32-M05-S			196 (7.7)		
2094-BC04-M03-S	272 (10.7)	249 (9.8)	196 (7.7)	256 (10.1)	374 (14.7)
2094-BC07-M05-S				318 (12.5)	436 (17.2)

IMPORTANT

The peak current ratings of the Kinetix 6000 AM modules (series A and B) are configured at the factory as 150% of continuous current. You can program 2094-BMP5-S, 2094-BM01-S, and 2094-BM02-S series-B drives and their equivalent IAM (inverter) modules, up to 250% of continuous inverter current.

AM Module (inverter) 460V Power Specifications (series A and B)

Attribute	2094-BMP5-S (2094-BC01-MP5-S)	2094-BM01-S (2094-BC01-M01-S)	2094-BM02-S (2094-BC02-M02-S)	2094-BM03-S (2094-BC04-M03-S)	2094-BM05-S (2094-BC07-M05-S)
Bandwidth ⁽¹⁾ Velocity loop Current loop	500 Hz 1300 Hz				
PWM frequency	8 kHz		4 kHz		
Nominal input voltage	650V DC				
Continuous current (rms)	2.8 A	6.1 A	10.3 A	21.2 A	34.6 A
Continuous current (sine) 0-pk	4.0 A	8.6 A	14.6 A	30.0 A	48.9 A
Peak current (rms)	4.2 A ⁽²⁾ 7.0 A ⁽³⁾	9.2 A ⁽²⁾ 15.3 A ⁽³⁾	15.5 A ⁽²⁾ 25.8 A ⁽³⁾	31.8 A ⁽²⁾	51.9 A ⁽²⁾
Peak current (0-pk)	5.9 A ⁽²⁾ 9.9 A ⁽³⁾	12.9 A ⁽²⁾ 21.6 A ⁽³⁾	21.8 A ⁽²⁾ 36.4 A ⁽³⁾	45.0 A ⁽²⁾	73.4 A ⁽²⁾
Continuous power out (nom)	1.8 kW	3.9 kW	6.6 kW	13.5 kW	22.0 kW
Internal shunt Continuous power Peak power	50 W 5.6 kW			200 W 22.5 kW	
Internal shunt resistor	115 Ω			28.75 Ω	
Shunt on	805V DC				
Shunt off	755V DC				
Efficiency	98%				
Capacitance	75 μF	150 μF	270 μF	840 μF	1175 μF
Capacitive energy absorption	10 J	19 J	35 J	108 J	152 J
Short circuit current rating	200,000 A (rms) symmetrical				

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

(2) Applies to Series A drives.

(3) Applies to Series B drives when configured for Peak-enhanced mode. For more information on drive performance in the Peak-enhanced mode, refer to [Peak Enhancement Specifications](#) on [page 272](#).

Weight Specifications

Kinetix 6000 Module	Cat. No.	Weight, approx. kg (lb)
IAM (230V)	2094-AC05-MP5-S	2.23 (4.9)
	2094-AC05-M01-S	2.27 (5.0)
	2094-AC09-M02-S	2.31 (5.1)
	2094-AC16-M03-S	4.71 (10.4)
	2094-AC32-M05-S	7.43 (16.4)
AM (230V)	2094-AMP5-S	1.46 (3.2)
	2094-AM01-S	1.50 (3.3)
	2094-AM02-S	1.54 (3.4)
	2094-AM03-S	3.13 (6.9)
	2094-AM05-S	3.18 (7.0)
Power rails (Slim)	2094-PRS1	1.05 (2.3)
	2094-PRS2	1.59 (3.5)
	2094-PRS3	2.14 (4.7)
	2094-PRS4	2.67 (5.9)
	2094-PRS5	3.11 (6.8)
	2094-PRS6	3.55 (7.8)
	2094-PRS7	3.99 (8.8)
	2094-PRS8	4.43 (9.7)

Kinetix 6000 Module	Cat. No.	Weight, approx. kg (lb)
IAM (460V)	2094-BC01-MP5-S	4.98 (11.0)
	2094-BC01-M01-S	5.03 (11.1)
	2094-BC02-M02-S	5.08 (11.2)
	2094-BC04-M03-S	9.60 (21.1)
	2094-BC07-M05-S	10.1 (22.3)
AM (460V)	2094-BMP5-S	2.44 (5.4)
	2094-BM01-S	2.49 (5.5)
	2094-BM02-S	2.54 (5.6)
	2094-BM03-S	4.58 (10.1)
	2094-BM05-S	4.98 (11.0)
Shunt module	2094-BSP2	3.10 (6.8)
Slot-filler module	2094-PRF	0.45 (1.0)

Maximum Feedback Cable Lengths

Although motor feedback cables are available in standard lengths up to 90 m (295.3 ft), the drive/motor/feedback combination may limit the maximum feedback cable length. These tables assume the use of recommended cables as shown in the Motor/Actuator Cable Selection table on [page 380](#).

Cable Lengths for Compatible Rotary Motors

Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)	Resolver m (ft)
MPL-A15xxx... MPL-A2xxx-E/V	30 (98.4)			
MPL-A3xxx... MPL-A5xxx-S/M ⁽¹⁾	30 (98.4)			
MPL-B15xxx... MPL-B2xxx-E/V		90 (295.3)		
MPL-B3xxx... MPL-B5xxx-S/M		90 (295.3)		
MPL-A/B15xxx... MPL-A/B45xxx-H			30 (98.4)	
MPL-Bxxx-R				90 (295.3)
MPM-Axxxxx-S/M	30 (98.4)			

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, J, L, or R fuses, with current rating as indicated in the table below. The following fuse examples and Allen-Bradley circuit breakers are recommended for use with 2094-*x*C*xx*-M*xx*-S IAM modules when the Line Interface Module (LIM) is not used.

IMPORTANT

LIM Modules (catalog numbers 2094-AL*xx*S, 2094-BL*xx*S, and 2094-XL75S-C*x*) provide branch circuit protection to the IAM module. Follow all applicable NEC and local codes.

IAM Module Cat. No.	V AC Input Power			Control Input Power		DC Common Bus Fuse		
	Bussmann Fuse	Allen-Bradley Circuit Breaker		Bussmann Fuse	Allen-Bradley Circuit Breaker	Bussmann Fuse	Ferraz Shawmut Fuse	
		Disconnect	Magnetic Contactor					
2094-AC05-MP5-S	KTK-R-20 (20 A)	1492-SP3D300	140M-F8E-C16	FNQ-R-10 (10 A)	1492-SP2D060	N/A	A50P20-1	
2094-AC05-M01-S								
2094-AC09-M02-S	KTK-R-30 (30 A)	1492-SP3D400	140M-F8E-C20			FWH-35B	A50P35-4	
2094-AC16-M03-S	LPJ-45SP (45 A)	N/A	140U-H6C3-C50		1492-SP2D200	FWH-60B	A50P60-4	
2094-AC32-M05-S	LPJ-80SP (80 A)	N/A	140U-H6C3-C90			FWH-125B	A50P125-4	
2094-BC01-MP5-S	KTK-R-20 (20 A)	1492-SP3D300	140M-F8E-C32		1492-SP2D060	N/A	A100P20-1	
2094-BC01-M01-S								
2094-BC02-M02-S	KTK-R-30 (30 A)	1492-SP3D400	140M-F8E-C45				FWJ-40A	A100P40-1
2094-BC04-M03-S	LPJ-45SP (45 A)	N/A	140U-H6C3-C50				FWJ-70A	A100P70-1
2094-BC07-M05-S	LPJ-80SP (80 A)		140U-H6C3-C90				FWJ-125A	A100P125-1

Contactor Ratings

The table below lists the recommended contactor ratings for integrated axis modules installed without a line interface module.

IAM Module (230V) Cat. No.	Contactor
2094-AC05-MP5-S	100-C23x10 (AC coil)
2094-AC05-M01-S	100-C23Zx10 (DC coil)
2094-AC09-M02-S	100-C37x10 (AC coil) 100-C37Zx10 (DC coil)
2094-AC16-M03-S	100-C72x10 (AC coil) 100-C72Zx10 (DC coil)
2094-AC32-M05-S	100-C85x10 (AC coil) 100-C85Zx10 (DC coil)

IAM Module (460V) Cat. No.	Contactor
2094-BC01-MP5-S	100-C23x10 (AC coil)
2094-BC01-M01-S	100-C23Zx10 (DC coil)
2094-BC02-M02-S	100-C37x10 (AC coil) 100-C37Zx10 (DC coil)
2094-BC04-M03-S	100-C60x10 (AC coil) 100-C60Zx10 (DC coil)
2094-BC07-M05-S	100-C72x10 (AC coil) 100-C72Zx10 (DC coil)

Input Transformer for Control Power

Attribute	Value
Input volt-amperes	750VA
Input voltage	460V AC
Output voltage	120...240V AC

Bulletin 2094 Power Rail

The Bulletin 2094 power rail is compatible with Kinetix 6000, Kinetix 6200, and Kinetix 6500 drive families. This section contains selection information, mounting dimensions, and catalog numbers for the 2094-PRSt (Slim) power rails. Bulletin 2094 power rails are compatible with all 230V and 460V drive modules.

IAM, AM, and Shunt Module Slot Requirements

IAM Module Cat. No.		Converter Slot Used	Inverter Slots Used
2094-AC05-MP5-S	230V	1	1
2094-AC05-M01-S			1
2094-AC09-M02-S			1
2094-AC16-M03-S			1
2094-AC32-M05-S			2
2094-BC01-MP5-S 2094-BC01-MP5-M	460V	1	1
2094-BC01-M01-S 2094-BC01-M01-M			1
2094-BC02-M02-S 2094-BC02-M02-M			1
2094-BC04-M03-S			2
2094-BC07-M05-S			2

AM Module Cat. No.		Converter Slot Used	Inverter Slots Used
2094-AMP5-S	230V	0	1
2094-AM01-S			1
2094-AM02-S			1
2094-AM03-S			1
2094-AM05-S			1
2094-BMP5-S 2094-BMP5-M	460V	0	1
2094-BM01-S 2094-BM01-M			1
2094-BM02-S 2094-BM02-M			1
2094-BM03-S			2
2094-BM05-S			2

Shunt Module Cat. No.		Converter Slot Used	Inverter Slots Used
2094-BSP2	230/ 460V	0	1

Integrated axis modules (2094-AC32-M05-S, 2094-BC04-M03-S, and 2094-BC07-M05-S) and axis modules (2094-BM03-S and 2094-BM05-S) are double-wide modules and require two slots on the power rail.

AC Line Filters

This section contains AC line filter selection tables, specification tables, and dimension drawings. Use the tables below to match an AC line filter to your servo drive.

AC Line Filter Selection

Drive Family ⁽¹⁾	Drive Cat. No.	AC Line Filter Cat. No.
Kinetix 2000	2093-AC05-Mxx	2090-XXLF-TC116
		2090-XXLF-TC316
Kinetix 6000	2094-AC05-MP5-S	2090-XXLF-X330B
	2094-AC05-M01-S	
	2094-AC09-M02-S	
	2094-AC16-M03-S	2090-XXLF-375
	2094-AC32-M05-S	2090-XXLF-3100
	2094-BC01-MP5-S	2090-XXLF-X330B
	2094-BC01-M01-S	
	2094-BC02-M02-S	
	2094-BC04-M03-S	2090-XXLF-375B
	2094-BC07-M05-S	2090-XXLF-3100

Drive Family	Drive Cat. No.	AC Line Filter Cat. No.
Kinetix 6200/ Kinetix 6500	2094-BC01-MP5-M	2090-XXLF-X330B
	2094-BC01-M01-M	
	2094-BC02-M02-M	
Kinetix 7000	2099-BM06-S	2090-XXLF-TC350
	2099-BM07-S	
	2099-BM08-S	2090-XXLF-TC365
	2099-BM09-S	2090-XXLF-TC3100
	2099-BM10-S	2090-XXLF-TC3150
	2099-BM11-S	2090-XXLF-TC3200
	2099-BM12-S	2090-XXLF-TC3250
8720MC-RPS	8720MC-RPS065-Bx	8720MC-RFI80
	8720MC-RPS190-Bx	8720MC-EF190-VB ⁽²⁾

(1) For Bulletin 2097 line filters used with the Kinetix 300 drive family, refer to AC Line Filters on [page 237](#).

(2) Line filter unit includes magnetic contactor, harmonic filter, and varistor.

AC Line Filter Selection

Drive Family	Drive Cat. No.	AC Line Filter Cat. No.	Motor Cables > 30 m
Ultra3000/5000	2098-xxx-005	2090-UXLF-106	2090-UXLF-110
	2098-xxx-010	2090-UXLF-110	2090-UXLF-110
	2098-xxx-020	2090-UXLF-123	2090-UXLF-123
	2098-xxx-030	2090-UXLF-136	2090-UXLF-132
	2098-xxx-075	2090-UXLF-336	2090-UXLF-HV330
	2098-xxx-150	2090-UXLF-350	2090-UXLF-HV350
	2098-xxx-HV030, 2098-xxx-HV050, 2098-xxx-HV100, 2098-xxx-HV150	2090-UXLF-HV323	2090-UXLF-HV323
	2098-xxx-HV220	2090-UXLF-HV330	2090-UXLF-HV330
	2092-DA1, 2092-DA2	2090-UXLF-106	N/A
Ultra1500	2092-DA3	2090-UXLF-110	N/A
	2092-DA4, 2092-DA5	2090-UXLF-HV323	N/A