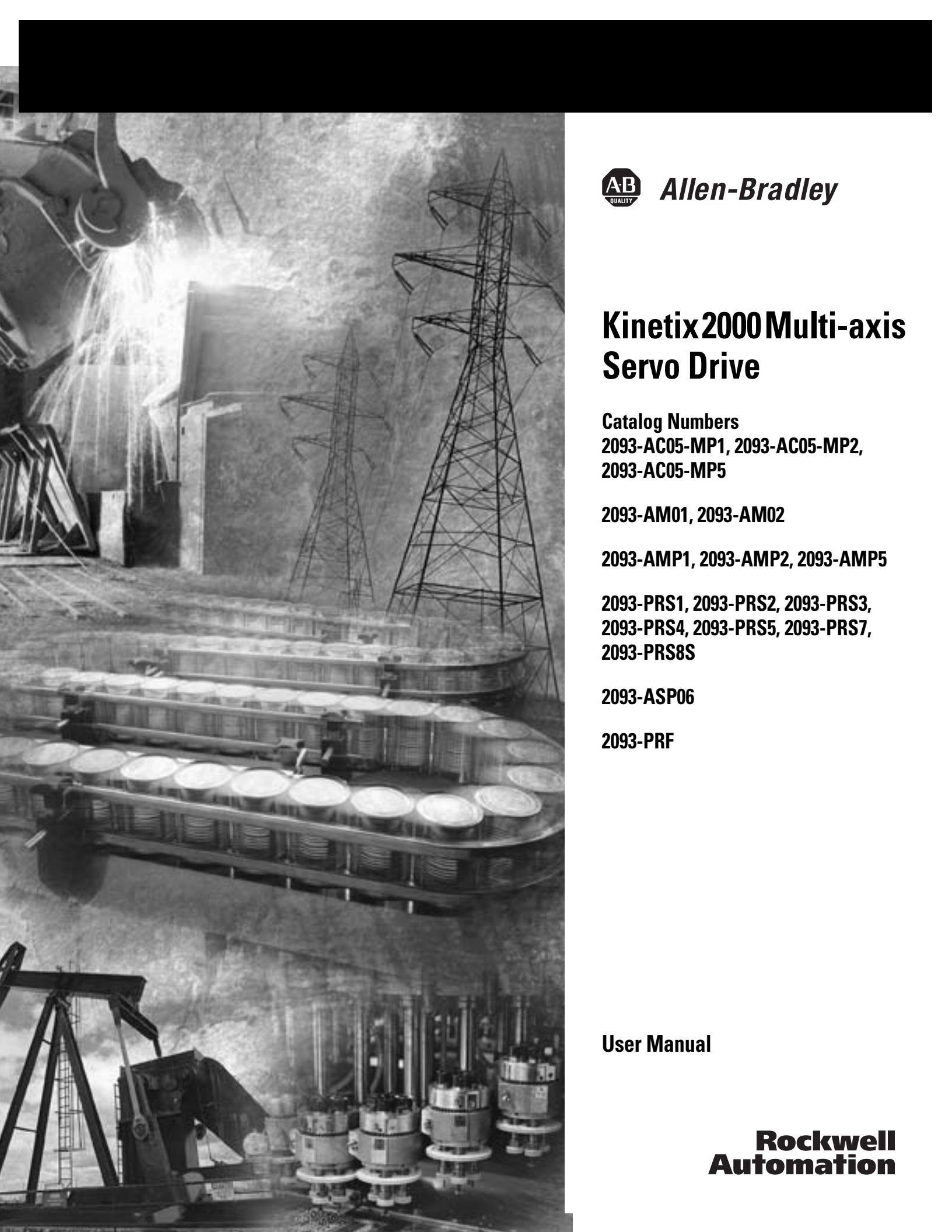




Allen-Bradley

Kinetix 2000 Multi-axis Servo Drive

Catalog Numbers

**2093-AC05-MP1, 2093-AC05-MP2,
2093-AC05-MP5**

2093-AM01, 2093-AM02

2093-AMP1, 2093-AMP2, 2093-AMP5

**2093-PRS1, 2093-PRS2, 2093-PRS3,
2093-PRS4, 2093-PRS5, 2093-PRS7,
2093-PRS8S**

2093-ASP06

2093-PRF

User Manual

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Catalog Number Explanation

Kinetix 2000 drive catalog numbers and descriptions are listed in the table below.

Kinetix 2000 Drive Catalog Numbers

Integrated Axis Modules (230V)	Catalog Number
Kinetix 2000, IAM, 230V, 3 kW ⁽¹⁾ Converter, 1 A Inverter	2093-AC05-MP1
Kinetix 2000, IAM, 230V, 3 kW ⁽¹⁾ Converter, 2 A Inverter	2093-AC05-MP2
Kinetix 2000, IAM, 230V, 3 kW ⁽¹⁾ Converter, 3 A Inverter	2093-AC05-MP5
Axis Modules (230V)	
Kinetix 2000, AM, 230V, 1 A Inverter	2093-AMP1
Kinetix 2000, AM, 230V, 2 A Inverter	2093-AMP2
Kinetix 2000, AM, 230V, 3 A Inverter	2093-AMP5
Kinetix 2000, AM, 230V, 6 A Inverter	2093-AM01
Kinetix 2000, AM, 230V, 9 A Inverter	2093-AM02
Power Rails	
Kinetix 2000, Single-Axis Power Rail	2093-PRS1
Kinetix 2000, Two-Axis Power Rail	2093-PRS2
Kinetix 2000, Three-Axis Power Rail	2093-PRS3
Kinetix 2000, Four-Axis Power Rail	2093-PRS4
Kinetix 2000, Five-Axis Power Rail	2093-PRS5
Kinetix 2000, Seven-Axis Power Rail	2093-PRS7
Kinetix 2000, Eight-Axis Power Rail with Shunt or Slot Filler	2093-PRS8S
Shunt Module	
Kinetix 2000, SM, 230V, 50 W	2093-ASP06
Slot Filler	
Kinetix 2000, SF, Power Rail Slot Filler	2093-PRF

⁽¹⁾ Derated to 2 kW for single-phase operation.

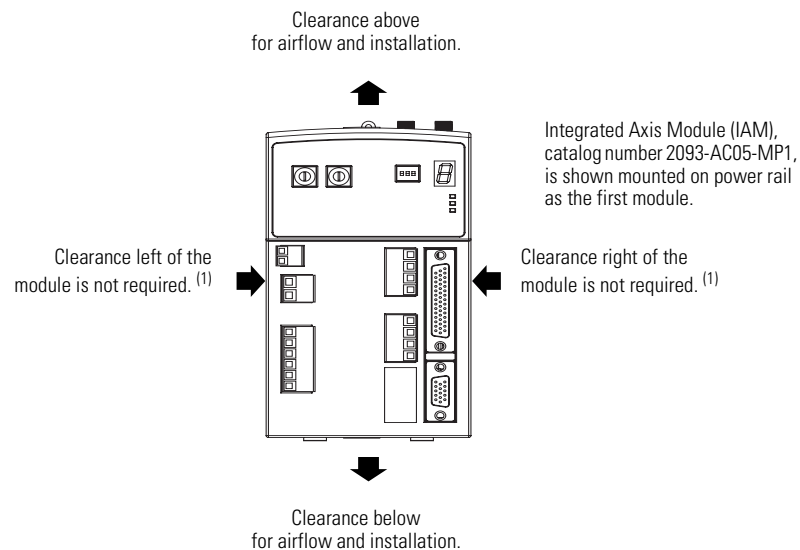
Minimum Clearance Requirements

This section provides information to assist you in sizing your cabinet and positioning your Kinetix 2000 system components.

IMPORTANT

Mount the module in an upright position. Do not mount the module on its side.

Minimum Clearance Requirements



⁽¹⁾ The power rail, catalog number 2093-PRSxx, does not extend left of the first module or right of the last module.

Minimum Clearance Dimensions

Cat. No.	Clearance Above, Min	Clearance Below, Min	Cabinet Depth Clearance, Min ⁽¹⁾	
2093-AC05-MP1, 2093-AC05-MP2, 2093-AC05-MP5, 2093-AMP1, 2093-AMP2, 2093-AMP5, 2093-AM01, 2093-AM02	50.8 mm (2.0 in.)	50.8 mm (2.0 in.)	200 mm (7.9 in.)	If 15-pin connector kit, catalog number 2090-K2CK-D15M, is attached.
			235 mm (9.25 in.)	44-pin connector kit options include: 2090-U3BK-D44xx connector kit (containing a 2090-U3BK-D44 terminal block and 2090-U3BK-D44xx cable) 2090-U3BK-D44 terminal block and custom-built cable. 2090-U3BK-D44 terminal block and flying lead cable.
2093-ASP06	305 mm (12.0 in.)	50.8 mm (2.0 in.)	200 mm (7.9 in.)	
2093-PRF	None	None	None	

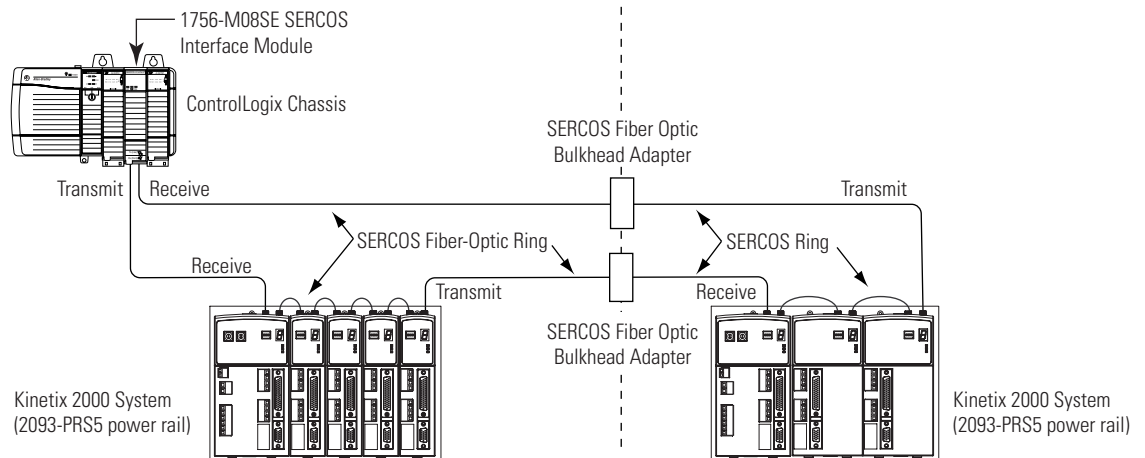
⁽¹⁾ Additional clearance required to accommodate cable bend restrictions.

In this example, the second Kinetix 2000 system is located in a separate cabinet and connected with bulkhead adapters.

IMPORTANT

To avoid signal loss, do not use bulkhead adapters to connect glass cables. Use bulkhead adapters only for plastic-to-plastic cable connections.

Fiber-optic Cable Example 4 (bulkhead adapters)



SERCOS Cables

The Kinetix 2000 supports the SERCOS fiber optic cables listed in the table.

Refer to the Fiber-optic Cable Installation and Handling Instructions, publication 2090-IN010, for additional information.

SERCOS Cable Selection for Kinetix 2000 Drives

Connection	Adjacent Connection (module to the right)	Catalog Number of SERCOS Cable ⁽¹⁾
2093-AC05-MP1 2093-AC05-MP2 2093-AC05-MP5	2093-AMP1 2093-AMP2 2093-AMP5	2090-SCEP0-1 series B
2093-AC05-MP1 2093-AC05-MP2 2093-AC05-MP5	2093-AM01 2093-AM02	2090-SCEP0-2
2093-AMP1 2093-AMP2 2093-AMP5	2093-AMP1 2093-AMP2 2093-AMP5	2090-SCEP0-1 series B

Power Specifications

This section contains power specifications for your IAM or AM components.

Converter Power Specifications

The following tables list power specifications for the converter section that resides within an integrated axis module.

IAM Converter (three-phase and single-phase) Power Specifications

Attribute	2093-AC05-MP $\times$ Three-phase Input (230V nom)	2093-AC05-MP $\times$ Single-phase Input (230V nom)
Input voltage, ac	170...264V rms	
Input frequency, ac	47...63 Hz	
Input current, ac main ⁽¹⁾ Nom (rms) Max inrush (0-pk)	11.66 A 34.0 A	10.95 A 34.0 A
Input voltage, dc (common bus follower)	240...375V dc	
Input current, dc (common bus follower)	9.76 A	6.42 A
Control power ac input voltage	170...264V rms single-phase (230V nom)	
Control power ac input current Nom (@ 230V ac) rms Max inrush (0-pk)	1.25 A 93.0 A ⁽²⁾	
Bus output voltage, nom	325V dc	
Line loss ride through	20 ms	
Continuous output current to bus (A_{dc})	9.67 A	6.42 A
Intermittent output current to bus (A_{dc}) ⁽³⁾	19.34 A	12.84 A
Bus overvoltage	425V dc	
Bus undervoltage	137.5V dc	
Internal shunt Continuous power Peak power	15 W 3000 W	
Internal shunt resistor	50 Ω	
Shunt on	405V	
Shunt off	375V	
Continuous power output to bus	3.0 kW	2.0 kW
Peak power output	6.0 kW	4.0 kW
Efficiency	95%	
Converter inductance	N/A	
Converter capacitance	540 μ F	
Converter leakage current (max)	2.0 mA	

⁽¹⁾ All 2093-AC05 integrated axis modules are limited to two contactor cycles per minute (with up to four axis modules), or one contactor cycle per minute (with five to eight axis modules).

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

⁽³⁾ Intermittent output current duration equals 250 ms.

Inverter Power Specifications

The following tables list power specifications for the inverter section that resides within an integrated axis module or an axis module.

IAM Inverter Power Specifications

Attribute	2093-AC05-MP1	2093-AC05-MP2	2093-AC05-MP5
Bandwidth Velocity Loop ⁽¹⁾ Current Loop	500 Hz 860 Hz		
PWM frequency	8 kHz		
Nominal input voltage	325V dc		
Continuous current (rms)	1.0 A	2.0 A	3.0 A
Continuous current (0-pk)	1.41 A	2.83 A	4.24 A
Peak current (rms)	3.0 A	6.0 A	9.0 A
Peak current (0-pk)	4.20 A	8.48 A	12.7 A
Peak output current time, max	3 s from 0% drive utilization (0% soak)		
Continuous power out, nom	0.3 kW	0.6 kW	0.9 kW
Efficiency	98%		
Capacitance	200 μ F		
Capacitive energy absorption	7.5 J		
Inverter PCB leakage current	1 mA		

⁽¹⁾ Bandwidth values in the velocity loop vary based on tuning parameters and mechanical components.

AM Inverter Power Specifications

Specification	2093-AMP1	2093-AMP2	2093-AMP5	2093-AM01	2093-AM02
Bandwidth ⁽¹⁾ Velocity Loop Current Loop	500 Hz 860 Hz				
PWM frequency	8 kHz				
Nominal input voltage	325V dc				
Continuous current (rms)	1.0 A	2.0 A	3.0 A	6.0 A	9.5 A
Continuous current (0-pk)	1.41 A	2.83 A	4.24 A	8.48 A	13.4 A
Peak current (rms)	3.0 A	6.0 A	9.0 A	18.0 A	28.5 A
Peak current (0-pk)	4.20 A	8.48 A	12.7 A	25.5 A	40.3 A
Peak output current time (max)	3 s from 0% drive utilization (0% soak)				
Continuous power out (nom)	0.3 kW	0.6 kW	0.9 kW	1.9 kW	3.0 kW
Efficiency	98%				
Capacitance	200 μ F			540 μ F	
Capacitive energy absorption	7.5 J			20 J	
Inverter PCB leakage current	1 mA				

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

Auxiliary Control Power Specifications

This section lists auxiliary control power requirements for a Kinetix 2000 system comprised of an IAM, up to seven AMs, a Shunt Module, or a Slot Filler.

Auxiliary Control Power Specifications

Number of AMs (2093-AMPx or 2093-AMx)	Current Requirements (115V ac)	Current Requirements (230V ac)	Max Inrush	Input VA
0	0.3 A	0.15 A	93 A	50 VA
1	0.6 A	0.30 A		99 VA
2	0.9 A	0.45 A		148 VA
3	1.2 A	0.60 A		197 VA
4	1.5 A	0.75 A		247 VA
5	1.8 A	0.90 A		296 VA
6	2.1 A	1.05 A		345 VA
7	2.4 A	1.20 A		395 VA
Shunt Module (2093-ASP06)	2.5 A	1.25 A		410 VA
Slot Filler (2093-PRF)	—	—	—	—