

Kinetix 300 EtherNet/IP Indexing Servo Drives



The Kinetix 300 EtherNet/IP indexing drive provides a cost-effective single-axis solution for low axis count motion control applications. Using one standard Ethernet/IP network for an entire machine - including Motion, Control, I/O, and HMI simplifies wiring, reduces panel layout costs, and allows easy integration into manufacturing and enterprise systems. In addition, safe torque-off functionality helps protect personnel while increasing machine productivity.

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Kinetix 300 Servo Drive Components

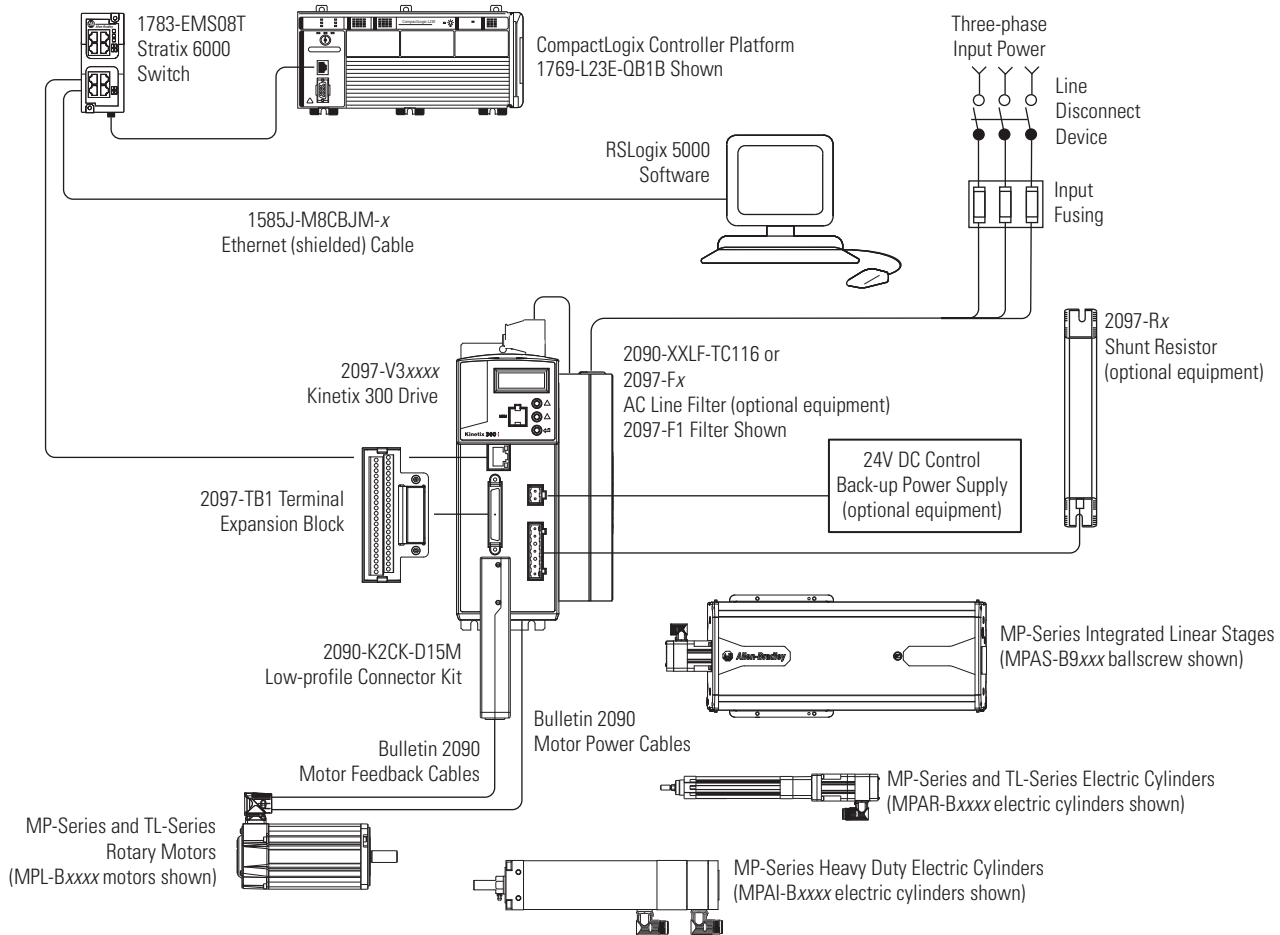
Kinetix 300 servo drive systems consist of these required components:

- One 2097-V3xxxx indexing drive
- One MP-Series or TL-Series servo motor or linear actuator
- One motor power and motor feedback cable
- One 2090-K2CK-D15M low-profile connector kit for motor feedback
- One 2097-TB1 I/O terminal expansion block
- 1585J-M8CBJM-x (shielded) Ethernet cable

Kinetix 300 servo drive systems may also include any of these optional components:

- One 2097-Fx or 2090-XXLF-TC116 AC line filter
- One 2097-Rx shunt resistor

Typical Configuration - Kinetix 300 Drive System



Kinetix 300 Drive Power Specifications

The 2097-V31PRx drives are capable of driving 240V motors at full speed.

Kinetix 300 Drive (single-phase) Power Specifications

Attribute	2097-V31PR0	2097-V31PR2	2097-V32PR0	2097-V32PR2	2097-V32PR4
AC input voltage	120/240V rms single-phase		240V rms single-phase		
AC input frequency	48...62 Hz				
Main AC input current ⁽¹⁾ Nom (rms) 120V input Max inrush (0-pk) 120V input	9.7 A 2.3 A	16.8 A 2.3A			
Nom (rms) 240V input Max inrush (0-pk) 240V input	5.0 A 1.1 A	8.6 A 1.1 A	5.0 A 136 A	8.6 A 2.3 A	15.0 A 2.3 A
Integrated AC line filter	No	No	Yes	Yes	Yes
Control power back-up input voltage	20...26V DC				
Control power back-up input current Nom Max inrush (0-pk)	500 mA 30 A				
Continuous output current (rms)	2.0 A	4.0 A	2.0 A	4.0 A	8.0 A
Continuous output current (0-pk)	2.8 A	5.7 A	2.8 A	5.7 A	11.3 A
Peak output current (rms) ⁽²⁾	6.0 A	12.0 A	6.0 A	12.0 A	24.0 A
Peak output current (0-pk)	8.5 A	17.0 A	8.5 A	17.0 A	33.9 A
Continuous power output	0.40 kW	0.80 kW	0.40 kW	0.80 kW	1.70 kW
Shunt On	390V DC				
Shunt Off	375V DC				
Overvoltage	430V DC				
Short circuit current rating	100,000 A (rms) symmetrical				

(1) Kinetix 300 drive modules are limited to 1 AC mains power cycling per minute.

(2) Peak RMS current allowed for up to 2 seconds with a 50% duty cycle.

Kinetix 300 Drive (three-phase) Power Specifications

Attribute	2097-V34PR3	2097-V34PR5	2097-V34PR6
AC input voltage	480V rms three-phase		
AC input frequency	48...62 Hz		
Main AC input current ⁽¹⁾ Nom (rms) Max inrush (0-pk)	2.7A 4.5 A	5.5 A 4.5 A	7.9 A 22.6 A
Integrated AC line filter	No	No	No
Control power back-up input voltage	20...26V DC		
Control power back-up input current Nom Max inrush (0-pk)	500 mA 30 A		
Continuous output current (rms)	2.0 A	4.0 A	6.0 A
Continuous output current (0-pk)	2.8 A	5.7 A	8.5 A
Peak output current (rms) ⁽²⁾	6.0 A	12.0 A	18.0 A
Peak output current (0-pk)	8.5 A	17.0 A	25.5 A
Continuous power output	1.00 kW	2.00 kW	3.00 kW
Shunt On	780V DC		
Shunt Off	750V DC		
Overvoltage	850V DC		
Short circuit current rating	100,000 A (rms) symmetrical		

(1) Kinetix 300 drive modules are limited to 1 AC mains power cycling per minute.

(2) Peak RMS current allowed for up to 2 seconds with a 50% duty cycle.

Kinetix 300 Drive Accessory Specifications

Kinetix 300 drive accessories include the I/O terminal block, memory module programmer, memory modules, AC line filters, and shunt resistors.

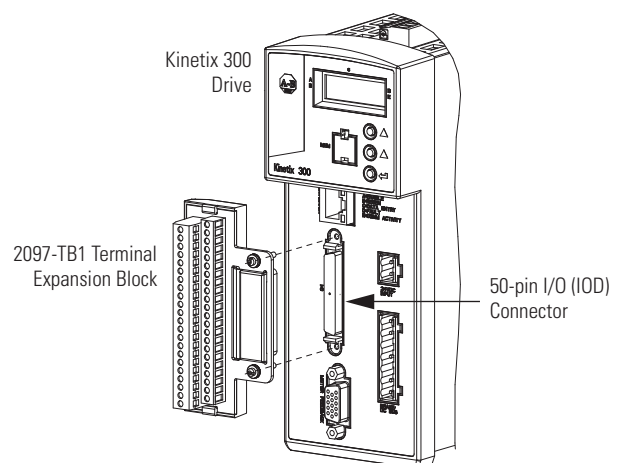
I/O Terminal Expansion Block

The 2097-TB1 I/O terminal expansion block is a drive-mounted breakout board for making flying-lead cable connections to the 50-pin IOD connector.

I/O Terminal Block Specifications (2097-TB1)

Wire Size	Change in Width ⁽¹⁾	Change in Depth ⁽¹⁾
1.5...0.2 mm ² (16...24 AWG)	10 mm (0.38 in.)	11 mm (0.42 in.)

(1) Add this value to the dimensions of your Kinetix 300 drive.

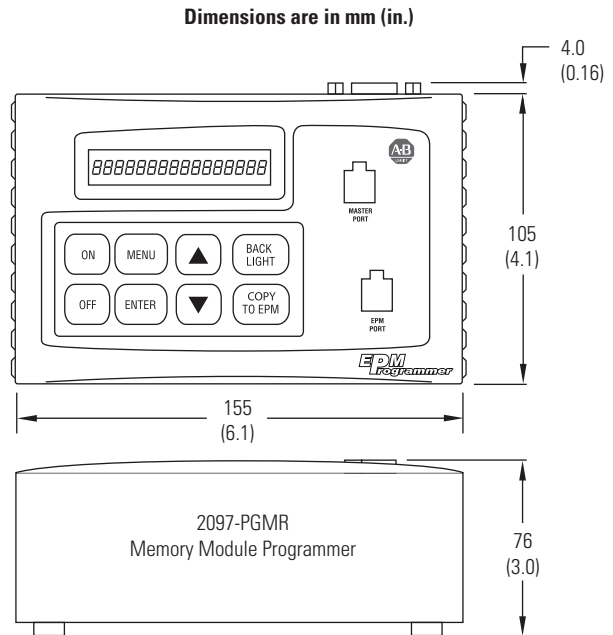


Memory Module Programmer

The 2097-PGMR memory module programmer is a hand-held device for duplicating your Kinetix 300 drive configuration to reduce down-time and troubleshooting.

Memory Module Programmer Specifications (2097-PGMR)

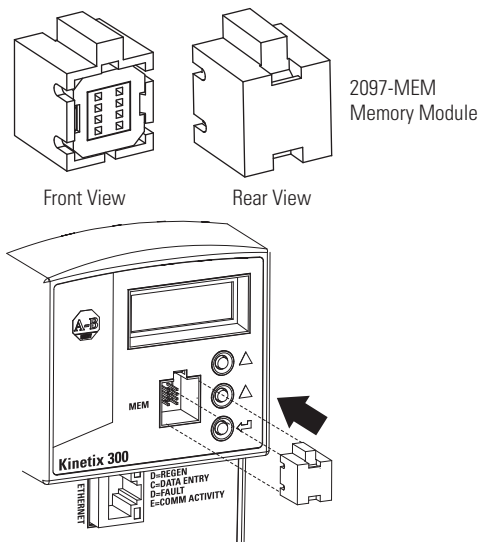
Attribute	Value	
DC supply	Internal batteries	+ 6V DC, min 150 mA supply 4 mono-cells (type D), 1.5V DC each
	External power supply unit	+ 6V DC, 300 mA, stabilized
Display	Type	LCD
	Display format	Text
	Lines x characters	1 x 16
	Contrast setting	Via menu
Memory	Data memory	Up to 120 parameter files for inverter drive controllers
Serial interface	DB9 connector	RS-232
Weight	2097-PGMR	1.3 kg (2.87 lb), with batteries



Memory Module 12-packs

The 2097-MEM memory modules use EEPROM technology in a plastic casing for protection and ruggedness to safe-guard your Kinetix 300 drive configuration.

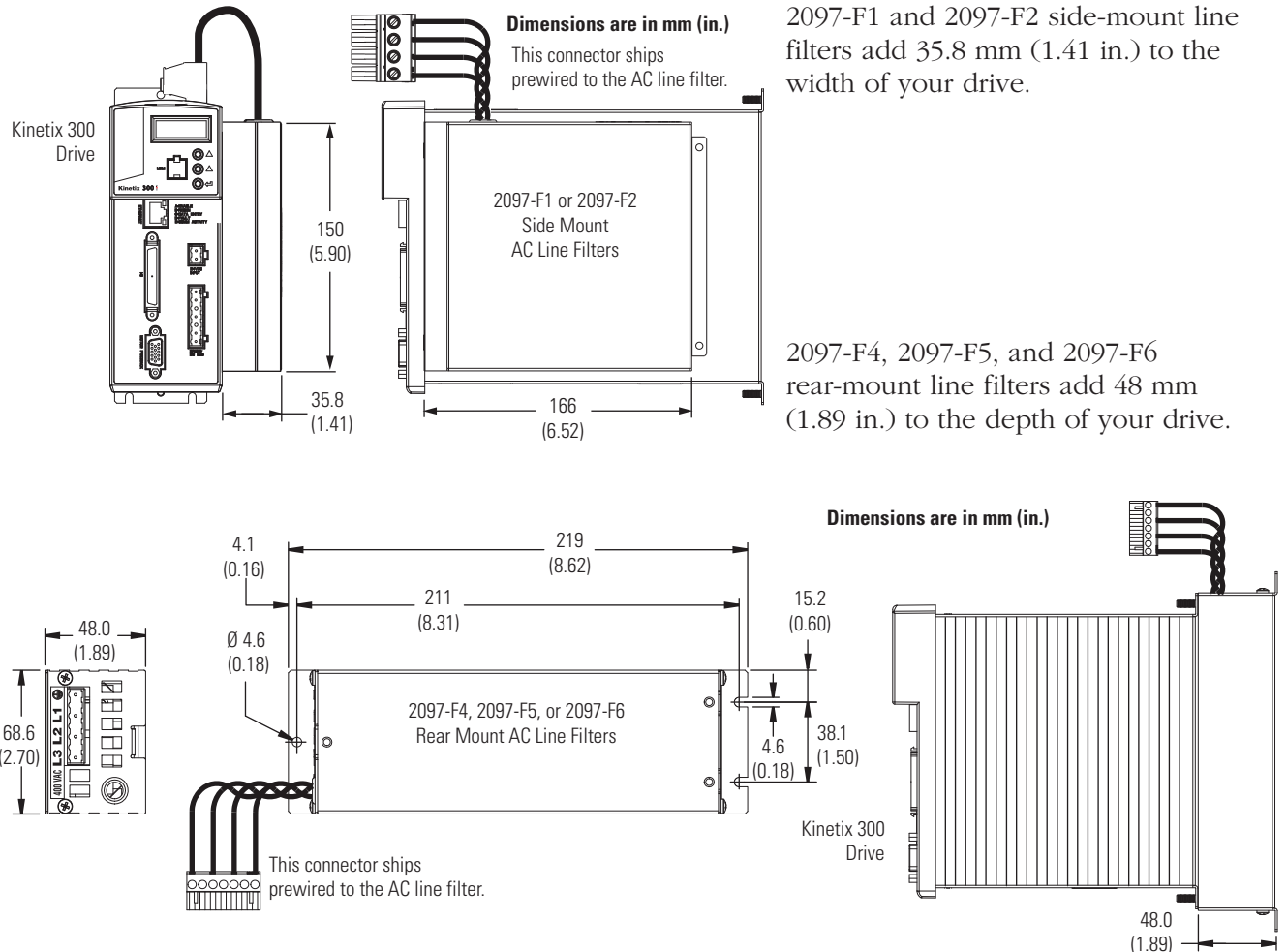
Use the 2097-MEM memory modules to back up your drive configuration for easy Automatic Device Replacement (ADR).



AC Line Filters

The Kinetix 300 drives were tested by using recommended line filters. Use of these filters is also needed to meet CE requirements. 2097-V32PR0, 2097-V32PR2, 2097-V32PR4 drives have integrated AC line filters.

AC Line Filter Dimensions



AC Line Filter Specifications

AC Line Filter Cat. No.	Mount	Voltage 50/60 Hz	Phase	Current A @ 40 °C (104 °F)	Power Loss W	Leakage Current mA	Weight, approx. kg (lb)	Kinetix 300 Drive (1) Cat. No.
2097-F1	Side	120/240V AC	1 or 3	24.0	5.2	9.0	0.6 (0.13)	2097-V33PR6
2097-F2		480V AC	3	10.0	2.8			2097-V34PR6
2097-F4 (2)	Rear	120/240V AC	1 or 3	4.40	1.2	1.0	0.8 (0.18)	2097-V33PR1
2097-F5 (2)		480V AC	3		1.3			2097-V34PR3
		2097-F6 (2)	120/240V AC	1 or 3	15.0			4.1

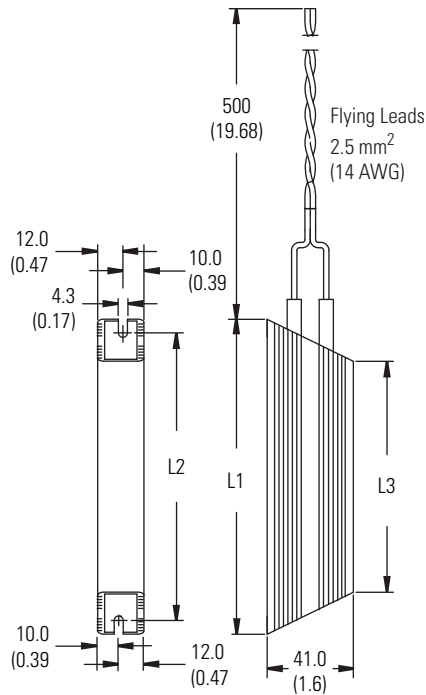
(1) Use 2090-XXLF-TC116 line filter for 2097-V31PR0 and 2097-V31PR2 drives. Refer to AC Line Filter Specifications on page 463 for more information.

(2) This filter is rated for multiple voltage/phase line conditions.

Shunt Resistor Specifications

The Bulletin 2097 passive shunt resistor wires directly to the Kinetix 300 drive.

Shunt Resistor Dimensions



Dimensions are in mm (in.)

Shunt Resistor Cat. No.	L1	L2	L3
2097-R2	210 (8.3)	197 (7.7)	170 (6.7)
2097-R3	210 (8.3)	197 (7.7)	170 (6.7)
2097-R4	150 (5.9)	137 (5.4)	110 (4.3)
2097-R6	210 (8.3)	197 (7.7)	170 (6.7)
2097-R7	150 (5.9)	137 (5.4)	110 (4.3)

Shunt Resistor Power Specifications

Shunt Module Cat. No.	Specifications						Kinetix 300 Drive Cat. No.
	Resistance Ω	Continuous Power W	Peak Power kW	Peak Current A	D_Application, Max ⁽¹⁾ %	Weight kg (lb)	
2097-R2	20	150	7.6	19.5	1.97	0.3 (0.7)	2097-V32PR4 2097-V33PR5
2097-R3	30		5.1	13.0	2.96		2097-V33PR6
2097-R4	40	80	3.8	9.8	2.10	0.2 (0.4)	2097-V31PRO 2097-V31PR2 2097-V32PRO 2097-V32PR2 2097-V33PR1 2097-V33PR3
2097-R6	75	150	7.9	10.3	1.90	0.3 (0.7)	2097-V34PR5 2097-V34PR6
2097-R7	150	80	4.0	5.1	2.02	0.2 (0.4)	2097-V34PR3

(1) D_Application is the application duty cycle in percent. For the intermittent regeneration applications, use $D_{Application} = t/T$, where t is the duration when regeneration is needed and T is the time interval between two regenerations. Both t and T must use the same time units, for example, seconds.

Kinetix 300 General System Specifications

This section contains environmental, weight, power dissipation, circuit breaker/fuse, transformer, and contactor specifications. Also included are maximum feedback cable length specifications and dimensions for mounting your Kinetix 300 drive.

Environmental Specifications

Attribute	Operational Range	Storage Range (nonoperating)
Ambient temperature	0...40 °C (32...104 °F)	-10...70 °C (14...158 °F)
Relative humidity	5...95% noncondensing	5...95% noncondensing
Altitude	De-rate by 1% per 300 m (1000 ft) above 1500 m (5000 ft)	3000 m (9842 ft) during transport
Vibration	5...2000 Hz @ 2.5 g peak, 0.015 mm (.0006 in.) maximum displacement	
Shock	15 g, 11 ms half-sine pulse (3 pulses in each direction of 3 mutually perpendicular directions)	

Weight Specifications

Drive Cat. No.	Weight, approx. kg (lb)
2097-V31PRO	1.3 (2.9)
2097-V31PR2	1.5 (3.3)
2097-V32PRO	1.4 (3.1)
2097-V32PR2	1.7 (3.7)
2097-V32PR4	2.2 (4.9)
2097-V33PR1	1.3 (2.9)

Drive Cat. No.	Weight, approx. kg (lb)
2097-V33PR3	1.5 (3.3)
2097-V33PR5	2.0 (4.4)
2097-V33PR6	1.9 (4.2)
2097-V34PR3	1.5 (3.3)
2097-V34PR5	2.0 (4.4)
2097-V34PR6	1.8 (4.0)

Power Dissipation Specifications

Use this table to size an enclosure and calculate required ventilation for your Kinetix 300 drive system.

Drive Cat. No.	Loss, Max W
2097-V31PRO	28
2097-V31PR2	39
2097-V32PRO	28
2097-V32PR2	39
2097-V32PR4	67
2097-V33PR1	28

Drive Cat. No.	Loss, Max W
2097-V33PR3	39
2097-V33PR5	67
2097-V33PR6	117
2097-V34PR3	39
2097-V34PR5	58
2097-V34PR6	99

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 or T fast-acting current-limiting type fuses, 200,000 AIC, preferred. Use Bussman KTK-R, JKN, JJS or equivalent. Thermal-magnetic type breakers preferred. The following fuse examples and Allen-Bradley circuit breakers are recommended for use with Kinetix 300 drives.

Fuse and Circuit Breaker Specifications

Drive Cat. No.	Mains VAC		
	Bussman Fuse	Allen Bradley Circuit Breaker ⁽¹⁾	
		Disconnect ⁽²⁾	Magnetic Contactor ⁽³⁾
2097-V31PR0	KTK-R-20 (20 A)	1492-SP3D300	140M-F8T-C32
2097-V31PR2			
2097-V32PR0			
2097-V32PR2			
2097-V32PR4	LPJ-45SP (45 A)	1492-SP3D400	140M-F8E-C45
2097-V33PR1	KTK-R-20 (20 A)	1492-SP3D300	140M-D8T-C20
2097-V33PR3			
2097-V33PR5			
2097-V33PR6	KTK-R-30 (30 A)	N/A	140U-F8T-C32
2097-V34PR3	KTK-R-20 (20 A)	1492-SP3D400	140M-F8T-C32
2097-V34PR5			
2097-V34PR6			

(1) When using Bulletin 1492 circuit protection devices, the maximum short circuit current available from the source is limited to 5000 A.

(2) Use fully-rated short-circuit protection circuit breaker for device branch circuit protection only when there is an upstream fully-rated breaker.

(3) Fully-rated breaker for overload current and short circuit rating.

Contactor Ratings

This table lists the recommended contactor ratings for Kinetix 300 Drive.

Kinetix 300 Drive (120/240V) Cat. No.	Contactor
2097-V31PR0	100-C30x10 (AC coil) 100-C30Zx10 (DC coil)
2097-V31PR2	
Kinetix 300 Drive (240V) Cat. No.	
2097-V32PR0	100-C30x10 (AC coil) 100-C30Zx10 (DC coil)
2097-V32PR2	
2097-V32PR4	100-C37x10 (AC coil) 100-C23Zx10 (DC coil)
2097-V33PR1	100-C23x10 (AC coil) 100-C23Zx10 (DC coil)
2097-V33PR3	
2097-V33PR5	
2097-V33PR6	100-C30x10 (AC coil) 100-C30x10 (DC coil)
Kinetix 300 Drive (480V) Cat. No.	
2097-V34PR3	100-C37x10 (AC coil) 100-C23Zx10 (DC coil)
2097-V34PR5	
2097-V34PR6	

Transformer Specifications for Control Input Power

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

Maximum Feedback Cable Lengths

Although motor power and feedback cables are available in standard lengths up to 90 m (295.3 ft), Kinetix 300 drive maximum feedback cable length is 20 m (65.6 ft). 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

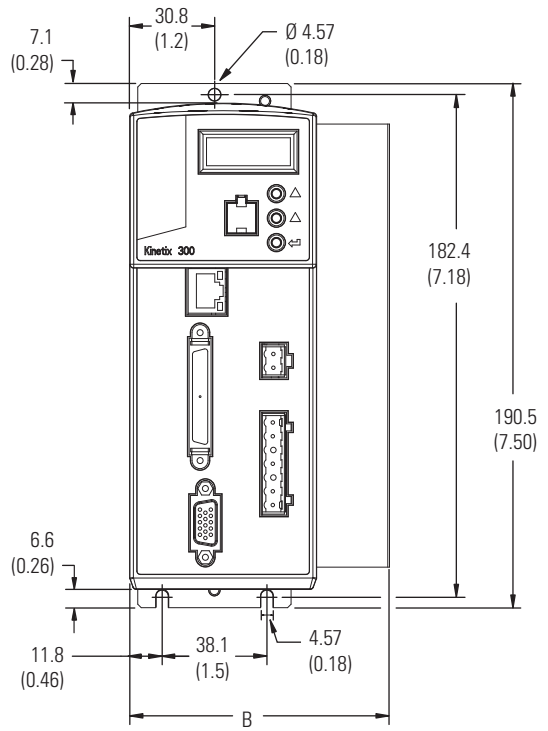
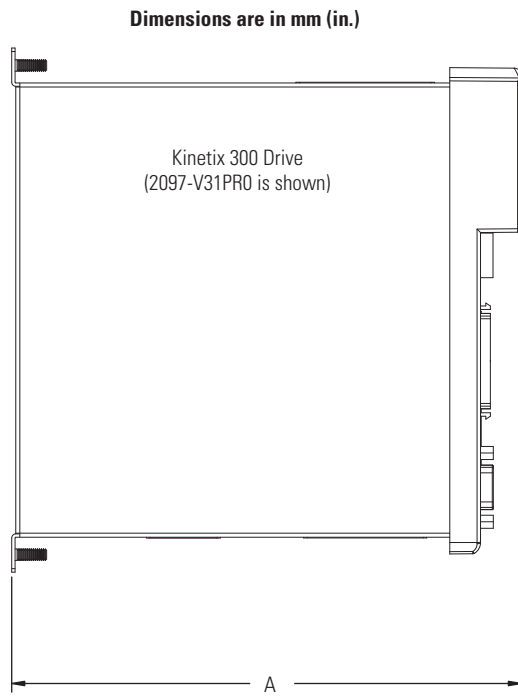
Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)	Absolute High-resolution (5V) 17-bit Encoder m (ft)
MPL-A3xxx... MPL-A5xxx-S/M ⁽¹⁾	20 (65.6)			
MPL-A15xxx... MPL-A2xxx-E/V	20 (65.6)			
MPL-B3xxx... MPL-B9xxx-S/M		20 (65.6)		
MPL-B15xxx... MPL-B2xxx-E/V		20 (65.6)		
MPL-A/B15xxx... MPL-A/B45xxx-H			20 (65.6)	
MPM-Axxxx-S/M	20 (65.6)			
MPM-Bxxxx-S/M		20 (65.6)		
MPF-Axxxx-S/M ⁽¹⁾	20 (65.6)			
MPF-Bxxxx-S/M		20 (65.6)		
MPS-Axxxx-S/M	20 (65.6)			
MPS-Bxxxx-S/M		20 (65.6)		
TLY-Axxxx-B				20 (65.6)
TLY-Axxxx-H			20 (65.6)	

(1) MPL-A5xxx and MPF-A5xxx motor encoders are rated for 9V, the remaining Bulletin MPL and MPF (230V) motor encoders are rated for 5V.

Cable Lengths for Compatible Linear Actuators

Actuator Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Absolute High-resolution (5V) 17-bit Encoder m (ft)
MPMA-Axxxx or MPAS-Axxxx-V (ballscrew)	20 (65.6)		
MPMA-Bxxxx or MPAS-Bxxxx-V (ballscrew)		20 (65.6)	
MPAR-Axxxx-V/M	20 (65.6)		
MPAR-Bxxxx-V/M		20 (65.6)	
TLAR-Axxxx-B			20 (65.6)
MPAI-AxxxxM3	20 (65.6)		
MPAI-BxxxxM3		20 (65.6)	

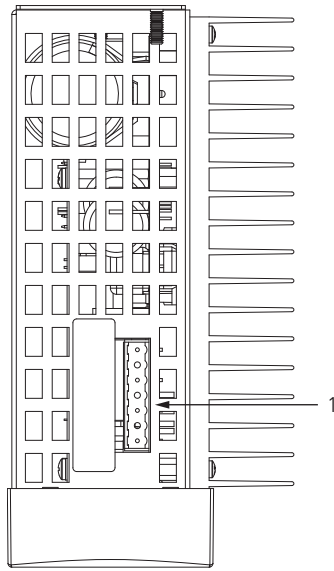
Kinetix 300 Drive Dimensions



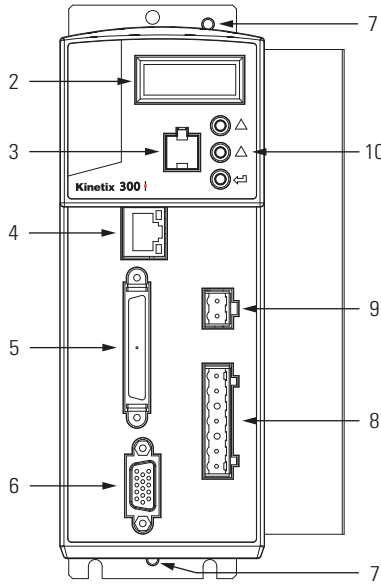
Cat. No.	A mm (in.)	B mm (in.)
2097-V31PR0	185.1 (7.29)	68.0 (2.68)
2097-V31PR2	185.1 (7.29)	68.5 (2.70)
2097-V32PR0	229.6 (9.04)	68.0 (2.68)
2097-V32PR2	229.6 (9.04)	68.5 (2.70)
2097-V32PR4	229.6 (9.04)	86.8 (3.42)
2097-V33PR1	185.1 (7.29)	68.0 (2.68)

Cat. No.	A mm (in.)	B mm (in.)
2097-V33PR3	185.1 (7.29)	68.5 (2.70)
2097-V33PR5	185.1 (7.29)	94.4 (3.72)
2097-V33PR6	229.6 (9.04)	68.0 (2.68)
2097-V34PR3	185.1 (7.29)	68.5 (2.70)
2097-V34PR5	185.1 (7.29)	94.4 (3.72)
2097-V34PR6	229.6 (9.04)	68.0 (2.68)

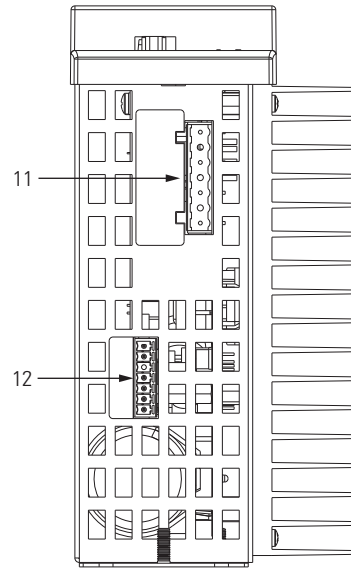
Kinetix 300 Connector and Indicator Locations



Kinetix 300 Drive, Top View
(2097-V33PR5 drive is shown)



Kinetix 300 Drive, Front View
(2097-V33PR5 drive is shown)



Kinetix 300 Drive, Bottom View
(2097-V33PR5 drive is shown)

Item	Description
1	Mains (IPD) connector
2	Status and diagnostic display
3	Memory module socket
4	Ethernet communication port (Port 1)
5	I/O (IOD) connector
6	Motor feedback (MF) connector ⁽¹⁾

Item	Description
7	Ground lug
8	Shunt resistor and DC bus (BC) connector
9	Back-up power (BP) connector
10	Display control push buttons (3)
11	Motor power (MP) connector
12	Safe torque-off (STO) connector

(1) The MF (15-pin) connector requires the 2090-K2CK-D15M low-profile connector kit.

For connector kit options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

Kinetix 300 Drive Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your drive. For questions regarding product availability, contact your Allen-Bradley distributor.

2097 - V3x PRx

