Technical Data

Original Instructions

Kinetix 5700, 5500, 5300, 5100, and ArmorKinetix Servo Drives Specifications

Kinetix 5700, Kinetix 5500, Kinetix 5300, Kinetix 5100, and ArmorKinetix

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This document provides catalog numbers and product specifications, including power, performance, environmental, certifications, dimension drawings, and accessories for Allen-Bradley® servo drives.

Use this publication with the Kinetix® Motion Control Selection Guide, publication KNX-SG001, to help make decisions selecting the motion control products that are best suited for your system requirements.

Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Page
Updated Kinetix 5700 drives certification listing.	27
Added shared-bus connector kit information for Kinetix 5700 drives.	41
Updated ArmorKinetix modules certification listing.	70
Added replacement drive connector kit information for ArmorKinetix PIM modules.	71
Added 195…264V rms, three-phase specifications to the Kinetix 5500 drive Input Power Specifications.	73

Servo Drive Compatibility

Servo Drive Family	Servo Motor Families														
	Kinetix VPL	Kinetix VPC	Kinetix VPF	Kinetix VPH	Kinetix VPS	Kinetix MPL	Kinetix MPM	Kinetix MPF	Kinetix MPS	Kinetix TLP	Kinetix TL	Kinetix TLY	Kinetix RDB	Kinetix MMA	Kinetix HPK
Kinetix 5700	X	X	X	X	X	X	X	X	X	–	–	–	X	X	X
Kinetix 5500	X	–	X	X	X	X	X	X	X	–	–	–	–	–	–
Kinetix 5300	–	–	–	–	–	X	X	X	X	X	X	X	–	–	–
Kinetix 5100	–	–	–	–	–	X	X	X	X	X	X	X	–	–	–
ArmorKinetix	X	–	X	X	X	X	X	X	X	–	–	–	–	–	–

Servo Drive Family	Integrated Linear Thrusters	Integrated Linear Stages		Electric Cylinders			Linear Motors	
	Kinetix LDAT	Kinetix MPAS	Kinetix MPMA	Kinetix VPAR	Kinetix MPAR	Kinetix MPAI	Kinetix LDC	Kinetix LDL
Kinetix 5700	X	X	X	X	X	X	X	–
Kinetix 5500	X (absolute encoder)	X (ballscrew)	X (ballscrew)	X	X	X	–	–
Kinetix 5300	X	X	X	–	X	X	X	X
Kinetix 5100	X (incremental)	X	X	–	X	X	X	X
ArmorKinetix	X	–	–	X	X	–	X	–

Kinetix 5700 Servo Drives



The Kinetix 5700 drive family helps expand the value of integrated motion on EtherNet/IP™ to large, custom machine-builder applications. Drive modules connect and operate by using ControlLogix® controllers, GuardLogix® controllers, CompactLogix™ controllers, or Compact GuardLogix controllers.

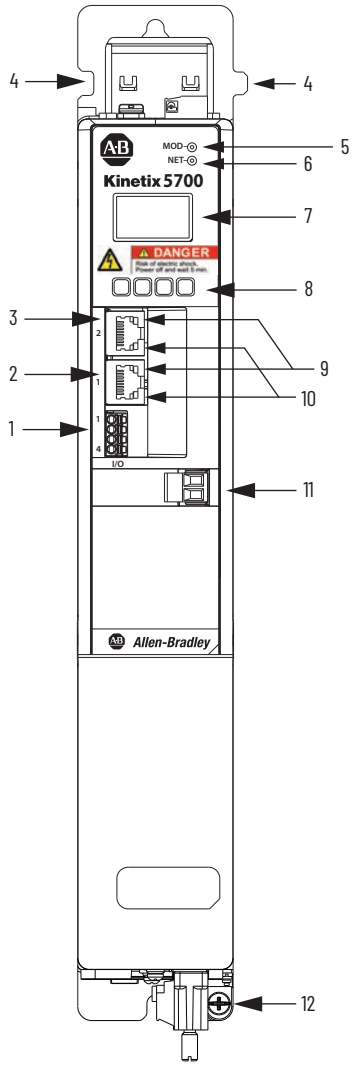
With the Logix Designer application as a single control engine, and one design environment – Studio 5000® – machine builders now have more flexibility to scale, design, and control to help meet their needs. Kinetix 5700 servo drives can help reduce commissioning time and improve machine performance. They offer the simplicity, power, and space savings you need to help get your machine up and running faster.

Kinetix 5700 servo drives are designed for machines with high axis-counts and high-power requirements. Single and dual-axis inverters are available with integrated (drive-based and controller-based) safety functions and hardwired (drive-based) safety functions.

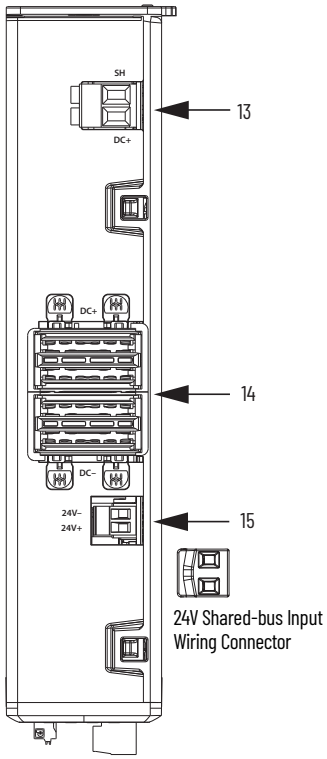
The iTRAK® power supply integrates the iTRAK system with the Kinetix 5700 drive family.

Kinetix 5700 Drive Module Features and Indicators

DC-bus Power Supply Features and Indicators

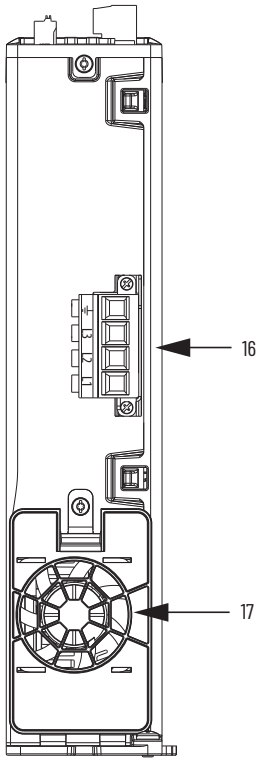


DC-bus Power Supply, Front View
(2198-P031 module is shown)



24V Shared-bus Input
Wiring Connector

DC-bus Power Supply, Top View
(2198-P031 module is shown)



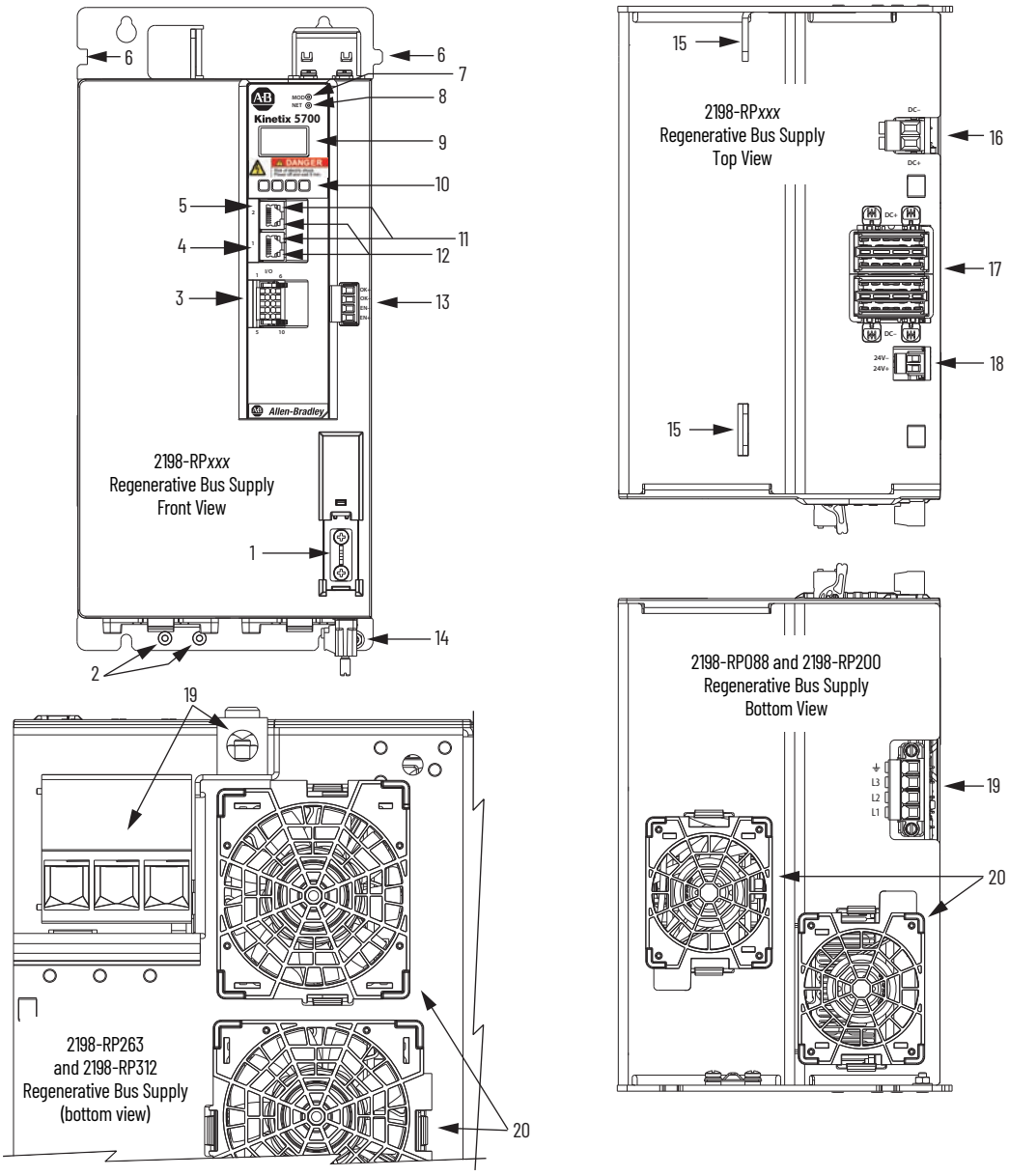
DC-bus Power Supply, Bottom View
(2198-P031 module is shown)

Item	Description
1	Digital inputs (IOD) connector
2	Ethernet (PORT1) RJ45 connector
3	Ethernet (PORT2) RJ45 connector
4	Zero-stack mounting tab/cutout
5	Module status indicator
6	Network status indicator

Item	Description
7	LCD display
8	Navigation pushbuttons
9	Link speed status indicators
10	Link/Activity status indicators
11	Contactor enable (EN) connector
12	Ground terminal

Item	Description
13	Shunt resistor (RC) connector
14	DC bus (DC) connector
15	24V control input power (CP) connector
16	AC Input power (IPD) connector
17	Cooling fan

Regenerative Bus Supply Features and Indicators



Regenerative Bus Supply Features and Indicators

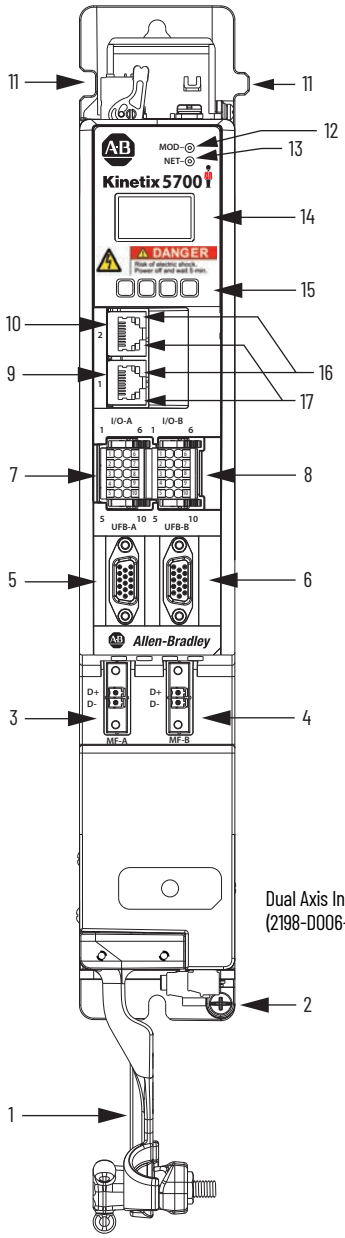
Item	Description
1	Ground jumper in operation
2	Ground jumper in storage
3	Digital inputs (IOD) connector
4	Ethernet (PORT1) RJ45 connector
5	Ethernet (PORT2) RJ45 connector
6	Zero-stack mounting tab/cutout
7	Module status indicator

Item	Description
8	Network status indicator
9	LCD display
10	Navigation push buttons
11	Link speed status indicators
12	Link/Activity status indicators
13	Contactor enable (CED) connector
14	Ground lug (partially obscured by input plug)

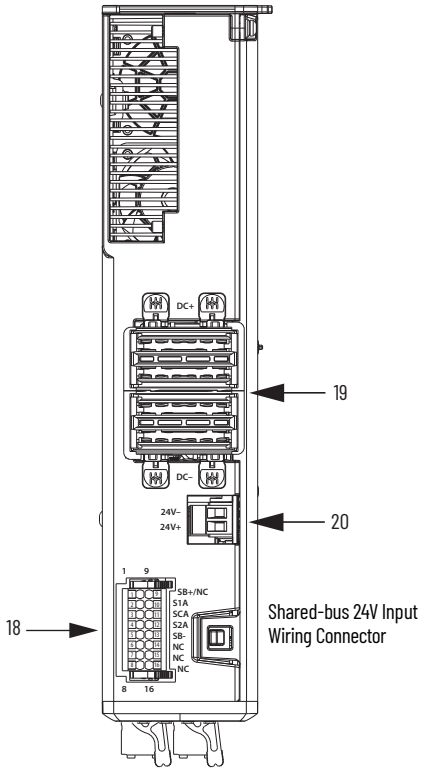
Item	Description
15	Lifting points
16	Active shunt (RC) connector
17	DC bus (DC) connector
18	24V control input power (CP) connector
19	AC Input power (IPD) connector (1)
20	Cooling fans

(1) Connector plug orientation applies to 2198-RP088 and 2198-RP200 modules (2198-RP200 connector size is larger). See adjacent figure for 2198-RP263 and 2198-RP312 connector plug size and orientation.

Dual-axis Inverter Features and Indicators

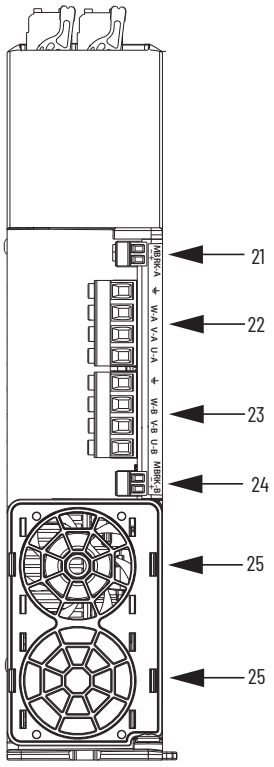


Dual Axis Inverter, Front View
(2198-D006-ERS4 module is shown)



Shared-bus 24V Input
Wiring Connector

Dual Axis Inverter, Top View
(2198-D006-ERS4 module is shown)



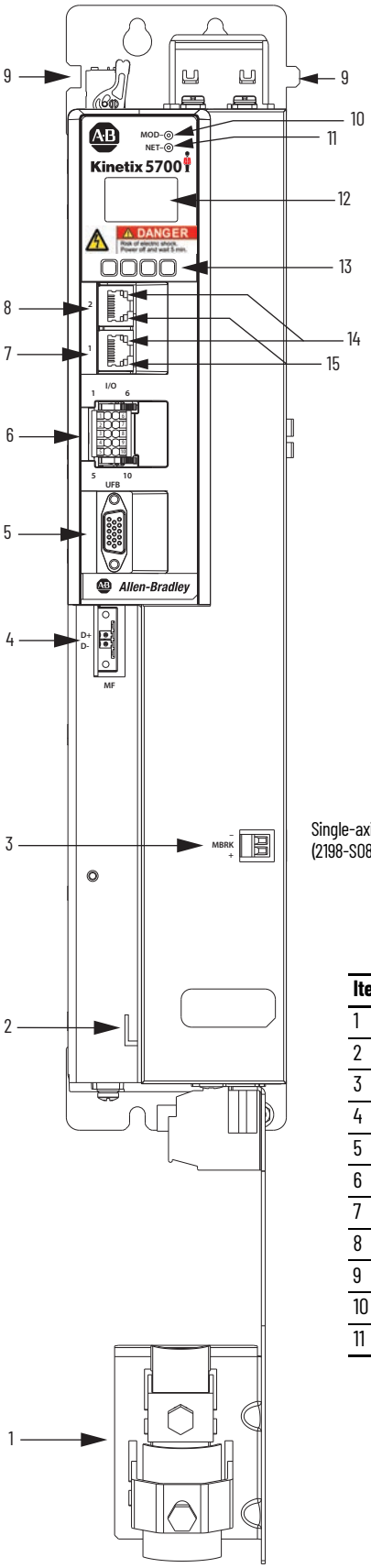
Dual Axis Inverter, Bottom View
(2198-D006-ERS4 module is shown)

Item	Description
1	Motor cable clamp
2	Ground terminal
3	Motor feedback (MF) connector - A
4	Motor feedback (MF) connector - B
5	Universal feedback (UFB) connector - A
6	Universal feedback (UFB) connector - B
7	Digital inputs (IOD) connector - A
8	Digital inputs (IOD) connector - B
9	Ethernet (PORT1) RJ45 connector

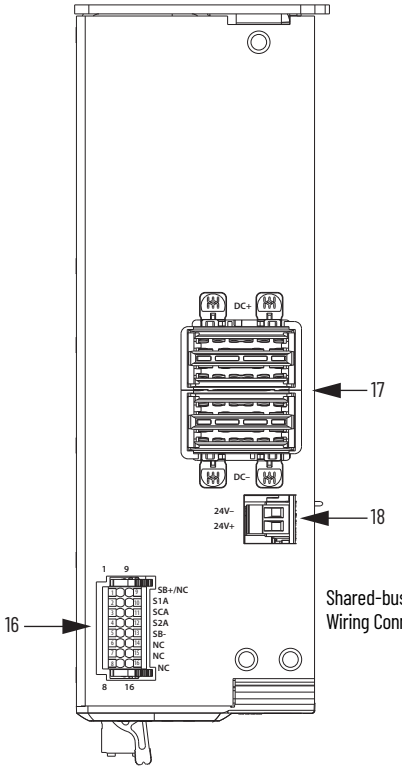
Item	Description
10	Ethernet (PORT2) RJ45 connector
11	Zero-stack mounting tab/cutout
12	Module status indicator
13	Network status indicator
14	LCD display
15	Navigation pushbuttons
16	Link speed status indicators
17	Link/Activity status indicators
18	Safe Torque Off (STO) connector

Item	Description
19	DC bus (DC) connector
20	24V control input power (CP) connector
21	Motor brake (BC) connector - A
22	Motor power (MP) connector - A
23	Motor power (MP) connector - B
24	Motor brake (BC) connector - B
25	Cooling fan

Single-axis Inverter Features and Indicators (catalog numbers 2198-S086-ERSx, 2198-S130-ERSx, and 2198-S160-ERSx)

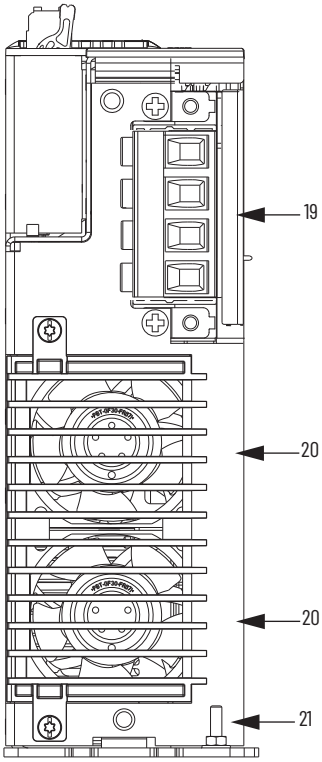


Single-axis Inverter, Front View
(2198-S086-ERS4 module is shown)



Shared-bus 24V Input
Wiring Connector

Single-axis Inverter, Top View
(2198-S086-ERS4 module is shown)

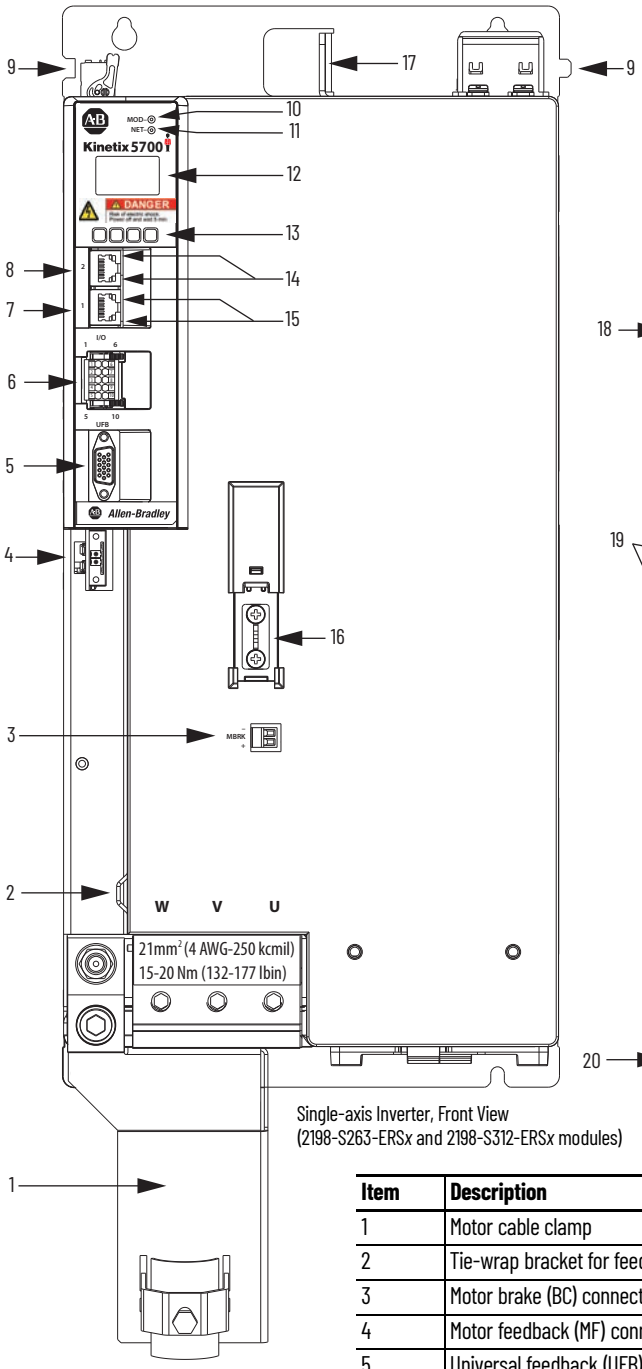


Single-axis Inverter, Bottom View
(2198-S086-ERS4 module is shown)

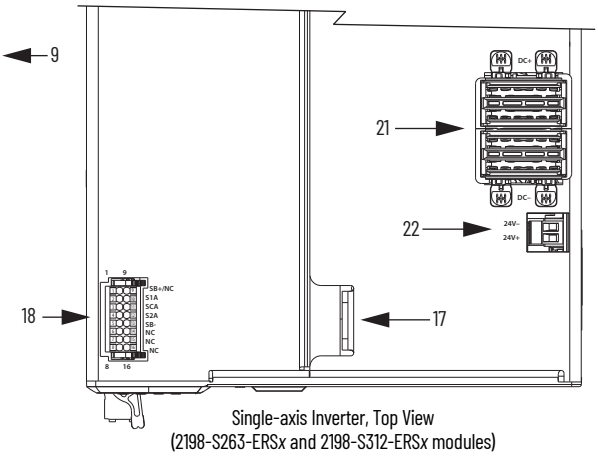
Item	Description
1	Motor cable clamp
2	Motor feedback cable tie-wrap bracket
3	Motor brake (BC) connector
4	Motor feedback (MF) connector
5	Universal feedback (UFB) connector
6	Digital inputs (IOD) connector
7	Ethernet (PORT1) RJ45 connector
8	Ethernet (PORT2) RJ45 connector
9	Zero-stack mounting tab/cutout
10	Module status indicator
11	Network status indicator

Item	Description
12	LCD display
13	Navigation pushbuttons
14	Link speed status indicators
15	Link/Activity status indicators
16	Safe Torque Off (STO) connector
17	DC bus (DC) connector
18	24V control input power (CP) connector
19	Motor power (MP) connector
20	Cooling fans
21	Ground terminal

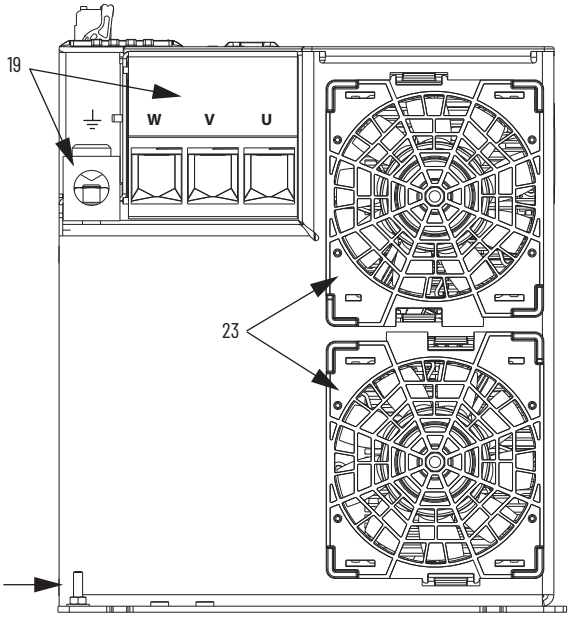
Single-axis Inverter Features and Indicators (catalog numbers 2198-S263-ERSx and 2198-S312-ERSx)



Single-axis Inverter, Front View
(2198-S263-ERSx and 2198-S312-ERSx modules)



Single-axis Inverter, Top View
(2198-S263-ERSx and 2198-S312-ERSx modules)

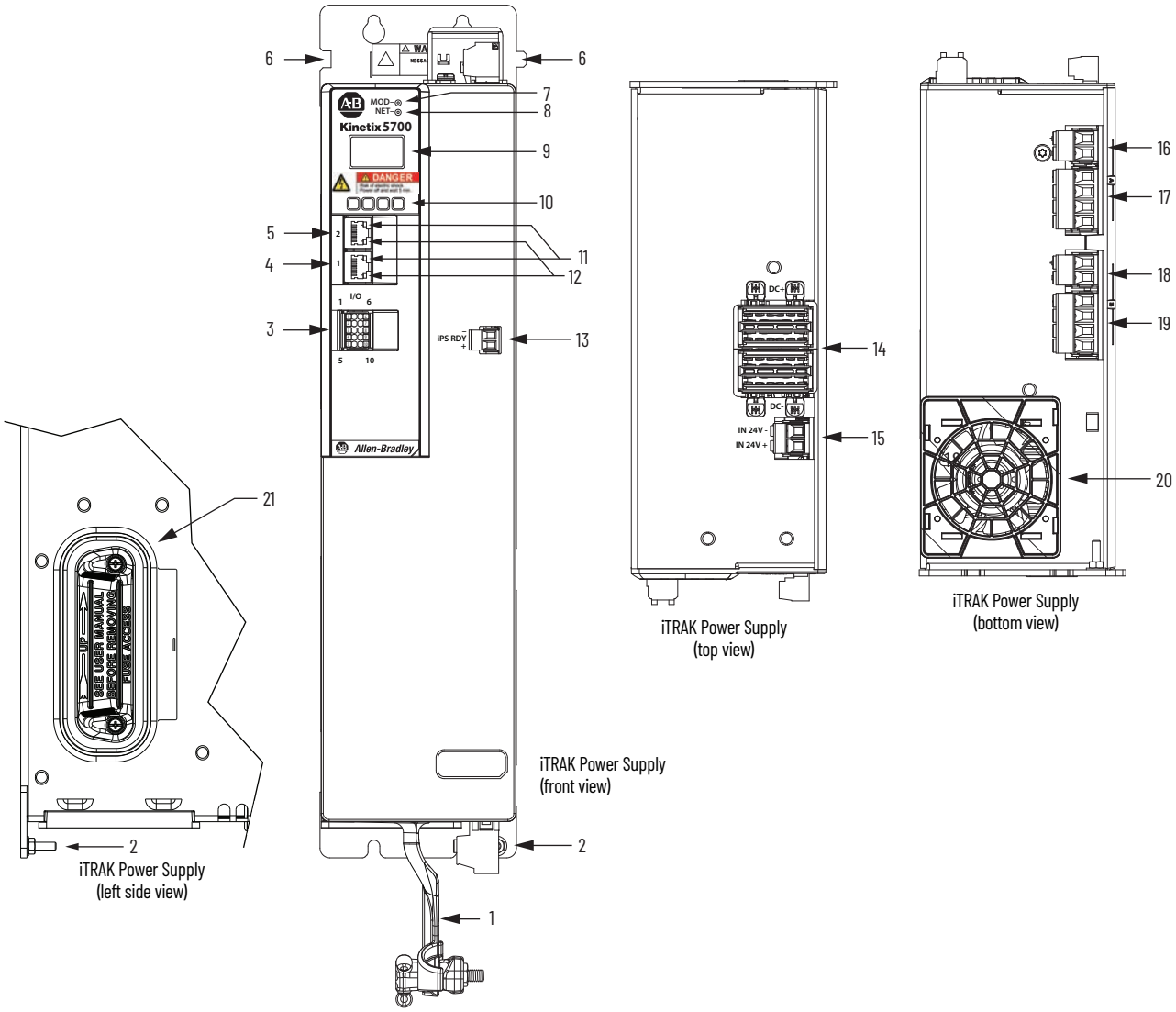


Single-axis Inverter, Bottom View
(2198-S263-ERSx and 2198-S312-ERSx modules)

Item	Description
1	Motor cable clamp
2	Tie-wrap bracket for feedback cable
3	Motor brake (BC) connector
4	Motor feedback (MF) connector
5	Universal feedback (UFB) connector
6	Digital inputs (IOD) connector
7	Ethernet (PORT1) RJ45 connector
8	Ethernet (PORT2) RJ45 connector
9	Zero-stack mounting tab/cutout
10	Module status indicator
11	Network status indicator
12	LCD display

Item	Description
13	Navigation pushbuttons
14	Link speed status indicators
15	Link/Activity status indicators
16	Ground jumper in operation
17	Safe torque-off (STO) connector
18	Lifting points
19	Motor power (MP) connector
20	Ground terminal
21	DC bus (DC) connector
22	24V control input power (CP) connector
23	Cooling fans (replacement kits available)

iTRAK Power Supply Features and Indicators



Item	Description
1	Power bus cable clamp
2	Ground lug (partially obscured by output plugs)
3	Digital inputs (IOD) connector
4	Ethernet (PORT1) RJ45 connector
5	Ethernet (PORT2) RJ45 connector
6	Zero-stack mounting tab/cutout
7	Module status indicator

Item	Description
8	Network status indicator
9	LCD display
10	Navigation push buttons
11	Link speed status indicators
12	Link/Activity status indicators
13	iTRAK PS ready (IR) connector
14	DC bus input (DC) connector

Item	Description
15	24V control input power (CP) connector
16	24V control output power (ICP) connector -A
17	DC bus output (IDC) connector - A
18	24V control output power (ICP) connector - B
19	DC bus output (IDC) connector - B
20	Cooling fan
21	Power supply internal fuse

See Additional Resources on page 149 for the publications that support the iTRAK system.

Technical Specifications - Kinetix 5700 Drive Modules

DC-bus Power Supply Specifications

Attribute	2198-P031	2198-P070	2198-P141	2198-P208
AC input voltage	195…528V rms, three-phase (240/480V nom)			
AC input frequency	47…63 Hz			
Main AC input current [1] 195…528V (rms) three-phase	11.2A	27.0 A	49.6 A	73.1 A
Max inrush (0…pk)	33.0 A	33.0 A	33.0 A	33.0 A
Peak AC input current 195…528V (rms) three-phase	33.4 A	74.3 A	148.7 A	219.2 A
Line loss ride through	20 ms			
Control power DC input voltage	24V DC ±10%			
Control power DC input current [1] [2]	0.8 A_{DC}		1.9 A_{DC}	
Nominal bus output voltage	276…747V DC			
Continuous output current to bus Three-phase	10.5 A_{DC}	25.5 A_{DC}	46.9 A_{DC}	69.2 A_{DC}
Peak output current to bus Three-phase	31.6 A_{DC}	70.3 A_{DC}	140.8 A_{DC}	207.6 A_{DC}
Peak output current duration [3]	1.0 s	1.0 s	1.0 s	0.1 s
Continuous output power to bus Nom (240V rms, three-phase at 1/2 power) Nom (480V rms, three-phase)	3.5 kW 7.0 kW	8.5 kW 17.0 kW	15.5kW 31.0 kW	23.0 kW 46.0 kW
Peak output power to bus Nom (240V rms, three-phase at 1/2 power) Nom (480V rms, three-phase)	10.5 kW 21.0 kW	23.0 kW 46.0 kW	46.5 kW 93.0 kW	69.0 kW 138.0 kW
Bus overvoltage 240V, nom AC input 480V, nom AC input	460V DC 832V DC			
Internal shunt resistance	37.5 Ω		13.5 Ω	
Internal shunt power	75 W		200 W	
Shunt on 240V, nom AC input 480V, nom AC input	400V plus 30V x bus regulator capacity/utilization [4] 775V plus 30V x bus regulator capacity/utilization [4]			
Shunt off 240V, nom AC input 480V, nom AC input	390V plus 30V x bus regulator capacity/utilization [4] 765V plus 30V x bus regulator capacity/utilization [4]			
Efficiency	99%			
Internal Capacitance	585 µF	780 µF	1640 µF	2050 µF
Capacitive energy absorption	129 J	172 J	362 J	453 J
Short-circuit current rating	200,000 A (rms) symmetrical			

(1) All modules are limited to 1 power cycle per minute.
(2) For current values when motors include a holding brake and additional information, refer to Control Power Current Specifications on page 13.
(3) Peak output current duration with 10% duty cycle.
(4) The shunt on and shunt off voltages increase during periods of shunting activity to promote sharing of shunt power in multi-axis configurations. Shunt utilization is equivalent to the BusRegulatorCapacity tag in the Logix Designer application.

Regenerative Bus Supply Specifications

Attribute	2198-RP088	2198-RP200	2198-RP263	2198-RP312
AC input voltage [1]	324…506V rms, three-phase (480V nom)			
AC input frequency	47…63 Hz			
Main AC input current [2] 324…506V (rms) three-phase	30.0 A	85.0 A	150.0 A	192.0 A
Max inrush (0-pk)	76.0 A	176.0 A	362.0 A	362.0 A
Peak AC input current 324…506V (rms) three-phase	75.0 A	170.0 A	225.0 A	288.9 A
Line loss ride through	20 ms			
Control power DC input voltage	24V DC ±10%			
Control power DC input current [2] [3]	4.3 A_{DC}	5.4 A_{DC}	9.1 A_{DC}	
Nominal bus output voltage	458…747V DC			
Continuous output current to bus	35.3 A_{DC}	100.0 A_{DC}	176.4 A_{DC}	207.0 A_{DC}
Peak output current to bus	88.0 A_{DC}	200.0 A_{DC}	263.0 A_{DC}	312.0 A_{DC}
Peak output current duration [4]	1.0 s/3.0 s			
Continuous output power to bus Nom (480V rms, three-phase)	24.0 kW	67.0 kW	119.0 kW	140.0 kW
Peak output power to bus Nom (480V rms, three-phase)	60.0 kW	135.8 kW	179.7 kW	211.4 kW
Bus overvoltage - 480V, nom AC input	832V DC			
Internal shunt resistance [5]	–		–	
Efficiency	98%			
Internal Capacitance	940 µF	2460 µF	4510 µF	5740 µF
Capacitive energy absorption	207 J	542 J	994 J	1265 J
Short-circuit current rating	200,000 A (rms) symmetrical			

(1) Applies when DC-bus voltage regulation is enabled. If DC-bus voltage regulation is not enabled, the input voltage range is 324….528V AC. For more information on these two modes of operation, see the Kinetix 5700 Servo Drives User Manual, publication 2198-UM002.
(2) All modules are limited to 1 power cycle per minute.
(3) For current values when motors include a holding brake and additional information, refer to Control Power Current Specifications on page 13.
(4) 1.0 second peak output current duration with 10% duty cycle. 3.0 second peak output current duration with 5% duty cycle.
(5) The 2198-RP*xxx* regenerative bus supply has no internal shunt resistor.

Single-axis Inverter Power Specifications

Attribute	2198-S086-ERS3 2198-S086-ERS4	2198-S130-ERS3 2198-S130-ERS4	2198-S160-ERS3 2198-S160-ERS4	2198-S263-ERS3 2198-S263-ERS4	2198-S312-ERS3 2198-S312-ERS4
Bandwidth [1] Velocity loop, max Current loop	400 Hz 1000 Hz				
PWM frequency	4 kHz				
Continuous output current (rms)	43.0 A	65.0 A	85.0 A	150.0 A	192.0 A
Continuous output current (0-pk)	60.8 A	91.9 A	120.2 A	212.1 A	271.5 A
Peak output current (rms)	86.0 A [2]	130.0 A [2]	160.0 A [2]	263.0 A@ 1 and 3 s duration 183.0 A@ 60 s duration	312.0 A@ 1 and 3 s duration 234.0 A@ 60 s duration
Peak output current (0-pk)	121.6 A [2]	183.8 A [2]	226.2 A [2]	371.9 A@ 1 and 3 s duration 258.8 A@ 60 s duration	441.2 A@ 1 and 3 s duration 330.9 A@ 60 s duration
Continuous power out (nom) Nom (240V rms, three-phase at 1/2 power) Nom (480V rms, three-phase)	14.9 kW 29.7 kW	22.5 kW 44.9 kW	30.1 kW 60.1 kW	45.0 kW 90.0 kW	56.0 kW 112.0 kW
DC input current @ 276…747V DC	45.7 A_{DC}	69.0 A_{DC}	92.3 A_{DC}	164.0 A_{DC}	207.0 A_{DC} [3]
Internal Capacitance	560 µF	840 µF	1120 µF	2050 µF	2050 µF

(1) Bandwidth values vary based on tuning parameters and mechanical components.
(2) Peak current duration (T_{PKmax}) equals 1.0 second.
(3) UL tested to 175.0 A_{DC}.

Dual-axis Inverter Power Specifications

Attribute	Per Axis [1]	2198-D006-ERS3 2198-D006-ERS4	2198-D012-ERS3 2198-D012-ERS4	2198-D020-ERS3 2198-D020-ERS4	2198-D032-ERS3 2198-D032-ERS4	2198-D057-ERS3 2198-D057-ERS4
Bandwidth [2] Velocity loop, max Current loop		 400 Hz 1000 Hz				
PWM frequency		4 kHz				
Continuous output current (rms)	X	2.5 A	5.0 A	8.0 A	13.0 A	23.0 A
Continuous output current (0-pk)	X	3.5 A	7.0 A	11.3 A	18.3 A	32.5 A
Peak output current (rms) [3]	X	6.3 A	12.5 A	20.0 A	32.5 A	57.5 A
Peak output current (0-pk) [3]	X	8.8 A	17.6 A	28.2 A	45.9 A	81.3 A
Continuous power out (nom) Nom (240V rms, three-phase at 1/2 power) Nom (480V rms, three-phase)	X	 0.9 kW 1.7 kW	 1.7 kW 3.4 kW	 2.8 kW 5.5 kW	 4.5 kW 8.9 kW	 8.0 kW 15.9 kW
DC input current @ 276...747V DC	X	2.7 A_{DC}	5.3 A_{DC}	8.5 A_{DC}	13.7 A_{DC}	24.5 A_{DC}
Internal Capacitance		165 µF		330 µF	390 µF	705 µF

(1) These attributes apply to both of the axes in each dual-axis inverter.
(2) Bandwidth values vary based on tuning parameters and mechanical components.
(3) Peak current duration (T_{PKmax}) equals 1.0 second.

iTRAK Power Supply Specifications

Attribute	2198T-W25K-ER
Input voltage	458...747V DC
Continuous output current (per output)	12.5 A
Peak output current	25 A
Continuous power output DC-bus output (low voltage) DC-bus output (high voltage)	4.1 kW 165V DC 330V DC
DC input current [1] @ 458V DC in @ 747V DC in	 10 A 6.2 A
Internal capacitance	390 µF

(1) Because the iTRAK power supply is a DC-DC converter with a constant output rating, input current varies linearly with input voltage.

Control Power Current Specifications

Kinetix 5700 servo drives, the accessory modules, and iTRAK power supply have different 24V DC power consumption. Factors to consider when calculating the combined current demand from your 24V DC power supply include the following:

- Catalog number for each drive in the system
- Whether servo motors include the holding brake option
- Whether the system includes capacitor modules or DC-bus conditioner modules
- Whether the system includes 2198T-W25K-ER iTRAK power supplies and the number of iTRAK motor modules supported

Control Power Current Specifications

Drive Module	Drive Module Cat. No.	24V Current Per Module (non-brake motor) (1) A_{DC}	24V Inrush Current (2) A
DC-bus Power Supplies	2198-P031	0.8	4.0
	2198-P070		
	2198-P141	1.9	
	2198-P208		
Regenerative Bus Supplies	2198-RP088	4.3	4.0
	2198-RP200	5.4	
	2198-RP263	9.1	
	2198-RP312		
Dual-axis Inverters	2198-D006-ERS*x*	1.4 (3)	4.0
	2198-D012-ERS*x*		
	2198-D020-ERS*x*		
	2198-D032-ERS*x*	1.7 (3)	
	2198-D057-ERS*x*	2.3 (3)	
Single-axis Inverters	2198-S086-ERS*x*	4.6	4.0
	2198-S130-ERS*x*		
	2198-S160-ERS*x*		
	2198-S263-ERS*x*		
	2198-S312-ERS*x*		
iTRAK Power Supply (4)	2198T-W25K-ER	1.3	2.2
Capacitor Module	2198-CAPMOD-2240	0.1	7.0
Extension Module	2198-CAPMOD-DCBUS-IO	–	–
DC-bus Conditioner Module	2198-DCBUSCOND-RP312	0.1	7.0

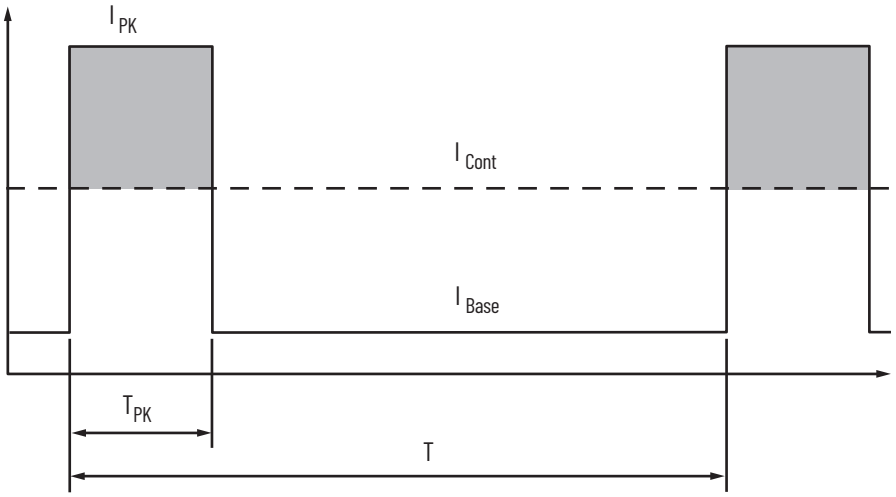
(1) For motor-brake current values, see the Kinetix Rotary Motion Specifications Technical Data, publication KNX-TD001.
(2) Inrush current duration is less than 30 ms.
(3) Values are base current per module.
(4) These values represent only the iTRAK power supply. They do not include the iTRAK motor modules that are connected to the iTRAK power supply and also draw current from this 24V control power input. For more information regarding 24V control power requirements, see iTRAK System with TriMax Bearings User Manual, publication 2198T-UM002, or iTRAK 5730 System User Manual, publication 2198T-UM003.

When the Kinetix 5700 inverter catalog number ends in -ERSx, for example 2198-D057-ERSx, the variable (x) indicates that the inverter (using this example) can be 2198-D057-ERS3 or 2198-D057-ERS4.

Peak Current Specifications

Load Duty-cycle Profile Example

$$D = \frac{T_{PK}}{T} \times 100\%$$



The 2198-S263-ERS*x* and 2198-S312-ERS*x* single-axis inverters have overload ratings for 1, 3, and 60 second durations to simplify migration from Kinetix 7000 high-power servo drives.

Overload Ratings for 2198-S263-ERSx and 2198-S312-ERSx Servo Drives

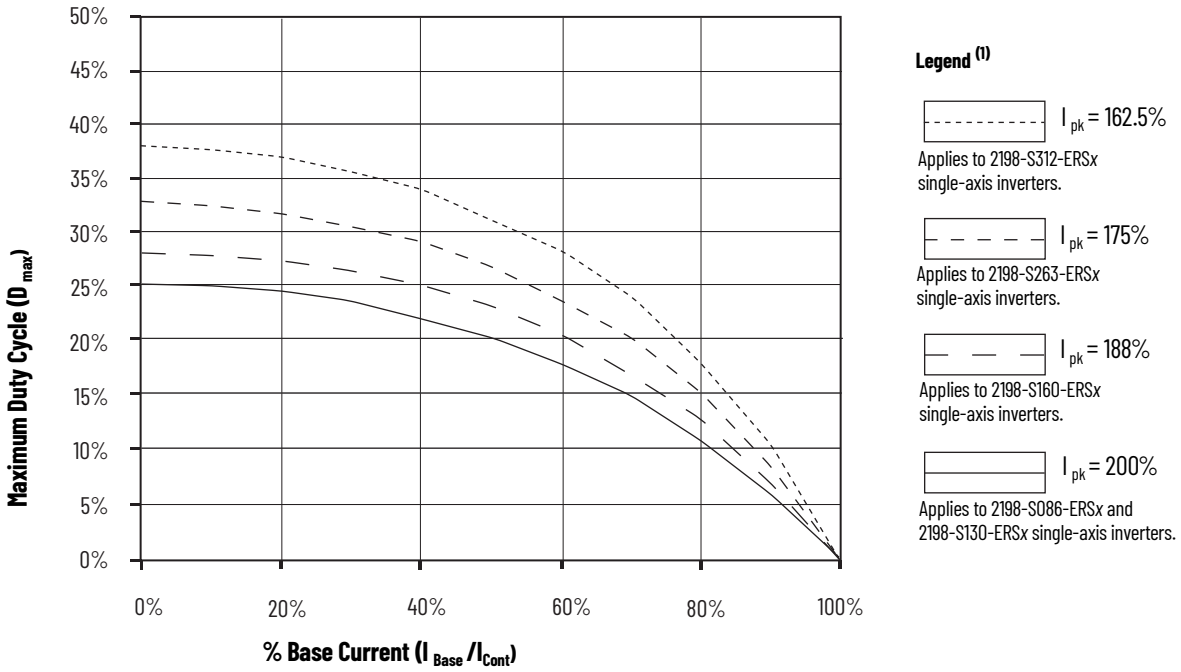
Drive Cat. No.	1 Second Overload Rating, max		3 Second Overload Rating, max		60 Second Overload Rating, max			
	Current for 1 s	Current for Off Period	Current for 3 s	Current for Off Period	Current for 60 s	Current for Off Period	Current for 3 s	Current for Off Period
2198-S263-ERS*x*	263 A_{rms}	30 A for ≤9 s	263 A_{rms}	30 A for ≤57 s	183 A_{rms}	98 A for ≤540 s	183 A_{rms}	98 A for ≤540 s
2198-S312-ERS*x*	312 A_{rms}	30 A for ≤9 s	312 A_{rms}	30 A for ≤57 s	234 A_{rms}	98 A for ≤540 s	234 A_{rms}	98 A for ≤540 s

Peak Duty Cycle Definition of Terms

Term	Definition (1)
Continuous Current Rating (I_{Cont})	The maximum value of current that can be output continuously.
Peak Current Rating (I_{PKmax})	The maximum value of peak current that the drive can output. This rating is valid only for overload times less than T_{PKmax}.
Duty Cycle (D)	The ratio of time at peak to the Application Period is defined as: $D = \frac{T_{PK}}{T} \times 100\%$
Time at Peak (T_{PK})	The time at peak current (I_{PK}) for a given loading profile. Must be less than or equal to T_{PKmax}.
Peak Current (I_{PK})	The level of peak current for a given loading profile. I_{PK} must be less than or equal to the Peak Current Rating (T_{PKmax}) of the drive.
Base Current (I_{Base})	The level of current between the pulses of peak current for a given loading profile. I_{Base} must be less than or equal to the continuous current rating (I_{Cont}) of the drive.
Loading Profile	The loading profile is composed of I_{PK}, I_{Base}, T_{PK}, and D (or T) values and completely specify the operation of the drive in an overload situation. These values are collectively defined as the Loading Profile of the drive.
Application Period (T)	The sum of the times at I_{PK} (T_{PK}) and I_{Base}.

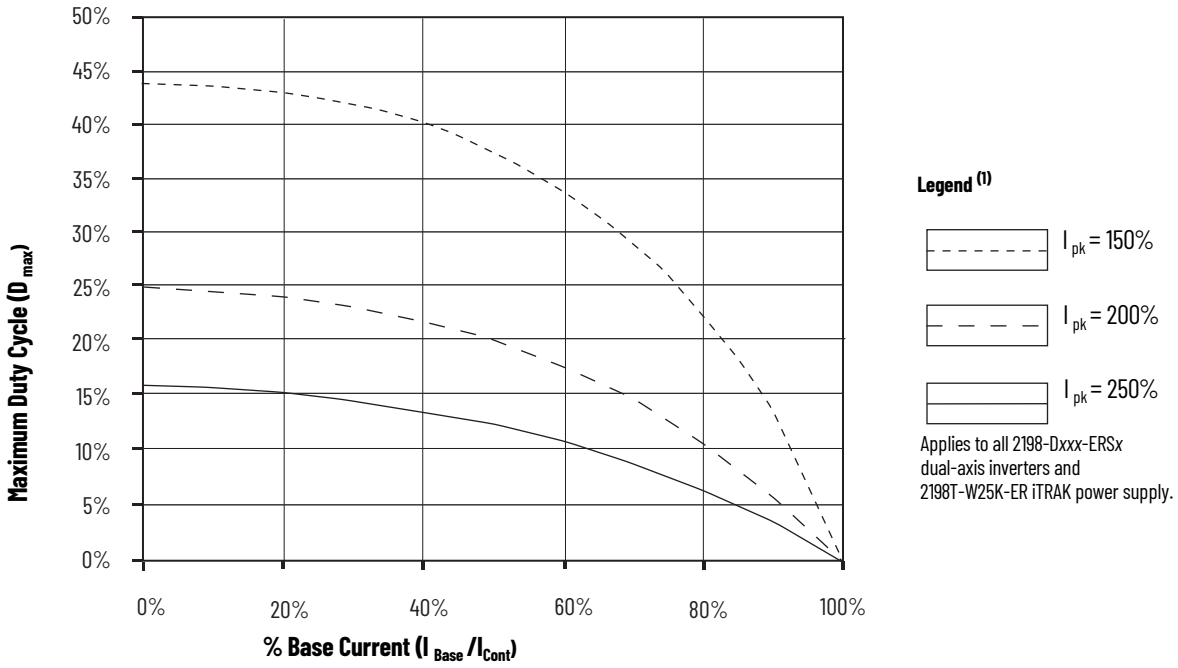
(1) All current values are specified as rms.

Peak Single-axis Inverter Overload (T_{PK} < 1.0 s)



(1) Base current (I_{Base}) and peak current (I_{PK}) are a percentage of the continuous drive current rating (I_{Cont}).

Peak Dual-axis Inverter and iTRAK Power Supply Overload (T_{PK} < 1.0 s)



(1) Base current (I_{Base}) and peak current (I_{PK}) are a percentage of the continuous drive current rating (I_{Cont}).

Circuit Breaker/Fuse Specifications

The Kinetix 5700 drives use internal solid-state motor short-circuit protection and, when protected by suitable branch circuit protection, are rated for use on a circuit capable of delivering up to 200,000 A (fuses) and 65,000 A (circuit breakers).

DC-bus Power Supply UL/CSA Circuit-protection Specifications

DC-bus Power Supply Cat. No.	Input Voltage (three-phase) nom	Bussmann Fuses (1) Cat. No.	Miniature CB (2) Cat. No.	Motor Protection CB, (2) (3) Self Protected CMC Cat. No.	Molded Case CB Cat. No.
2198-P031	195...528V AC	LPJ-15SP (15 A)	1489-M3D250	140M-D8E-C25 140MT-D9E-C25	140G-G6C3-C25
2198-P070		LPJ-40SP (40 A)	N/A	140M-F8E-C45	140G-G6C3-C50
2198-P141		LPJ-70SP (70 A)	N/A	N/A	140G-G6C3-C90
2198-P208		LPJ-100SP (100 A)	N/A	N/A	140G-G6C3-D12

(1) For applications requiring CSA certification, fuses (Bussmann catalog number 170M1760) must be added to the DC link between the two drive clusters when circuit breakers are used for branch circuit protection. The DC bus fuses are not required when AC line fuses are used for branch circuit protection.
(2) These Bulletin 140M/MT Motor Protection Circuit Breakers, when used as self-protected (Type E) devices, and Bulletin 1489 circuit breakers can be used on only WYE power systems (480Y/277V).
(3) The AIC ratings of the Bulletin 140M/MT devices can vary. See publication 140-TD005 or 140M-TD002.

Regenerative Bus Supply UL/CSA Circuit-protection Specifications

Cat. No.	Input Voltage (1) (three-phase) nom	Bussmann Fuses (2) Cat. No.	Mersen Fuses Cat. No.	Miniature CB Cat. No.	Molded Case CB Cat. No.
2198-RP088	324...506V AC rms	LPJ-45SP (45 A)	AJT45 (45 A)	–	140G-G6C3-C60
2198-RP200		LPJ-125SP (125 A)	AJT125 (125 A)	–	140G-J6F3-D15
2198-RP263		LPJ-200SP (200 A)	AJT200 (200 A)	–	140G-K6F3-D30
2198-RP312		LPJ-250SP (250 A)	AJT250 (250 A)	–	140G-K6F3-D40

(1) Applies when DC-bus voltage regulation is enabled. If DC-bus voltage regulation is not enabled, then the input voltage range is 324....528V AC. For more information on these two modes of operation, see the Kinetix 5700 Servo Drives User Manual, publication 2198-UM002.
(2) For applications requiring CSA certification, fuses (Bussmann catalog number 170M1760) must be added to the DC link between the two drive clusters when circuit breakers are used for branch circuit protection. The DC bus fuses are not required when AC line fuses are used for branch circuit protection.

DC-bus Power Supply IEC (non-UL/CSA) Circuit-protection Specifications

DC-bus Power Supply Cat. No.	Input Voltage (three-phase) nom	DIN gG Fuses Amps, max	Miniature CB Cat. No.		Motor Protection CB Cat. No. (1)	Molded Case CB Cat. No.
2198-P031	195...528V AC	16	1489-M3D250	N/A	140M-D8E-C25 140MT-D9E-C25	140G-G6C3-C25
2198-P070		40	N/A	1492-SPM3D400	140M-F8E-C45	140G-G6C3-C50
2198-P141		75	N/A	1492-SPM3D630	140MG-H8E-C60	140G-G6C3-C90
2198-P208		110	N/A	N/A	140MG-H8E-D10	140G-G6C3-D12

(1) The AIC ratings of the Bulletin 140M/MT devices can vary. See publication 140-TD005 or 140M-TD002.

Regenerative Bus Supply IEC (non-UL/CSA) Circuit-protection Specifications

Regenerative Bus Supply Cat. No.	Input Voltage (1) (three-phase) nom	DIN gG Fuses Amps, max	Miniature CB Cat. No.		Motor Protection CB Cat. No.	Molded Case CB Cat. No.
2198-RP088	324...506V AC rms	50	1489-M3C600	1492-SPM3C630	140MG-H8E-C60	140G-G6C3-C60
2198-RP200		125	–	–	140MG-J8E-D15	140G-J6F3-D15
2198-RP263		200	–	–	–	140G-K6F3-D30
2198-RP312		250	–	–	–	140G-K6F3-D40

(1) Applies when DC-bus voltage regulation is enabled. If DC-bus voltage regulation is not enabled, then the input voltage range is 324....528V AC. For more information on these two modes of operation, see the Kinetix 5700 Servo Drives User Manual, publication 2198-UM002.

Contactor Specifications

The DC-bus power supply contactor enable relay (CED connector) is rated at 24V DC and 1.0 A, max.

DC-bus Power Supply Contactor Specifications

DC-bus Power Supply Cat. No.	Contactor (1) (2) Cat. No.	Intermediate Relay (3) Cat. No.
2198-P031	100-C16EJ10	N/A
2198-P070	100-C37EJ10	
2198-P141	100-C72DJ10	700-HB32Z24 (relay) 700-HN153 (socket)
2198-P208	100-C97DJ10	
2198-P208 (2 in parallel)	100-E190KJ11	
2198-P208 (3 in parallel)	100-E305KJ11	

(1) Auxiliary contact configuration (10) is for 1 = N.O. or 0 = N.C. Other configurations are available.
(2) For contactors that are not Bulletin 100-E type, the integrated diode is required with the contactor coil.
(3) These DC-bus power supplies require an additional intermediate relay used with the contactor.

The regenerative power supply contactor enable relay (CED connector) is rated at 24V DC.

Regenerative Bus Supply Contactor Specifications

Regenerative Bus Supply (1) Cat. No.	Contactor (2) (3) Cat. No.	Intermediate Relay Cat. No.
2198-RP088	100-C43EJ10	N/A
2198-RP200	100-E116KJ11	
2198-RP263	100-E205KJ11	
2198-RP312	100-E265KJ11	

(1) These regenerative bus supplies can require an additional intermediate relay to be used with the contactor. Verify the peak current rating of the main contactor coil.
(2) Auxiliary contact configuration (10) is for 1 N.O. 0 N.C. Other configurations are available.
(3) For contactors that are not Bulletin 100-E type, the integrated diode is required with the contactor coil.

Power Dissipation Specifications

Use this table to size an enclosure and calculate required ventilation for your Kinetix 5700 drive system.

DC-bus Power Supply Cat. No.	Usage as % of Rated Power Output (watts)				
	20%	40%	60%	80%	100%
2198-P031	97	101	105	109	113
2198-P070	108	119	130	140	151
2198-P141	249	267	286	304	323
2198-P208	265	294	323	352	380
Regenerative Bus Supply Cat. No.					
2198-RP088	253	399	544	690	835
2198-RP200	532	832	1132	1432	1732
2198-RP263	850	1261	1672	2083	2494
2198-RP312	1037	1576	2115	2654	3193
Dual-axis Inverter Cat. No. (1)					
2198-D006-ERSx	17	29	41	53	65
2198-D012-ERSx	34	58	82	106	130
2198-D020-ERSx	52	84	116	148	180
2198-D032-ERSx	100	155	210	265	320
2198-D057-ERSx	252	354	456	558	660
Single-axis Inverter Cat. No.					
2198-S086-ERSx	190	255	325	400	475
2198-S130-ERSx	225	340	460	590	725
2198-S160-ERSx	270	420	570	760	950
2198-S263-ERSx	556	759	989	1245	1529
2198-S312-ERSx	610	883	1200	1561	1965
iTRAK Power Supply Cat. No.					
2198T-W25K-ER	206	272	338	404	470
Capacitor Module Cat. No.					
2198-CAPMOD-2240	28	34	42	51	62
2198-CAPMOD-DCBUS-IO	1.1	1.4	1.6	2.1	2.5
DC-bus Conditioner Module Cat. No.					
2198-DCBUSCOND-RP312	1.4	2.1	3.2	4.7	6.7

(1) Values for the dual-axis inverters are based on both axes (each axis dissipates half the rated power output). For example, the 2198-D006-ERSx dual-axis inverter (axis A) with usage of 20% (17/2=8.5 W) and (axis B) with usage of 60% (41/2= 20.5 W) dissipates a total of 29 W.

Weight Specifications

DC-bus Power Supply Cat. No.	Weight, approx kg (lb)
2198-P031	4.33 (9.55)
2198-P070	4.42 (9.74)
2198-P141	6.91 (15.2)
2198-P208	7.04 (15.5)

Regenerative Bus Supply Cat. No.	Weight, approx kg (lb)
2198-RP088	13.61 (30.0)
2198-RP200	38.56 (85.0)
2198-RP263	61.23 (135)
2198-RP312	

iTRAK Power Supply Cat. No.	Weight, approx kg (lb)
2198T-W25K-ER	7.60 (16.8)

Dual-axis Inverter Cat. No.	Weight, approx kg (lb)
2198-D006-ERS*x*	4.16 (9.17)
2198-D012-ERS*x*	
2198-D020-ERS*x*	
2198-D032-ERS*x*	
2198-D057-ERS*x*	6.76 (14.9)

Single-axis Inverter Cat. No.	Weight, approx kg (lb)
2198-S086-ERS*x*	5.21 (11.5)
2198-S130-ERS*x*	5.44 (12.0)
2198-S160-ERS*x*	6.80 (15.0)
2198-S263-ERS*x*	15.88 (35.0)
2198-S312-ERS*x*	

Maximum Cable Lengths

Combined motor power cable length for all axes on the same DC bus depends on the Kinetix 5700 system power supply and EMC line filter in use.

- For applications that include the 2198-P*xxx* DC-bus power supply and 2198-DB*xx*-F EMC line filter, the maximum length is up to 400 m (1312 ft)
  - When used with 2198-DBR*xx*-F EMC line filter, the maximum length is up to 1200 m (3937 ft)
- For applications that include the 2198-RP*xxx* regenerative bus supply and 2198-DBR*xx*-F EMC line filter, the maximum length is up to 1200 m (3937 ft)
  - 2198-DB*xx*-F EMC line filters are not compatible with 2198-RP*xxx* regenerative bus supplies

Drive-to-motor feedback cables up to 90 m (295 ft) can be used, depending on the feedback type and overall system design. See the Kinetix Rotary and Linear Motion Cable Specifications Technical Data, publication KNX-TD004, for cable specifications.

Drive-to-Motor Feedback Cable Length

Feedback Type	Cable Length, max (1) m (ft)
Single-turn or multi-turn absolute	up to 90 (295)
Incremental (2)	up to 30 (98.4)
EnDat	up to 90 (295)

(1) Cable length is not affected by use of the 2198-H2DCK converter kit on the Kinetix 5700 drive.
(2) For motors with incremental feedback, the maximum motor cable length is 30 m (98.4 ft).

IMPORTANT For more information on maximum motor cable lengths, see the Kinetix 5700 Servo Drives User Manual, publication 2198-UM002.

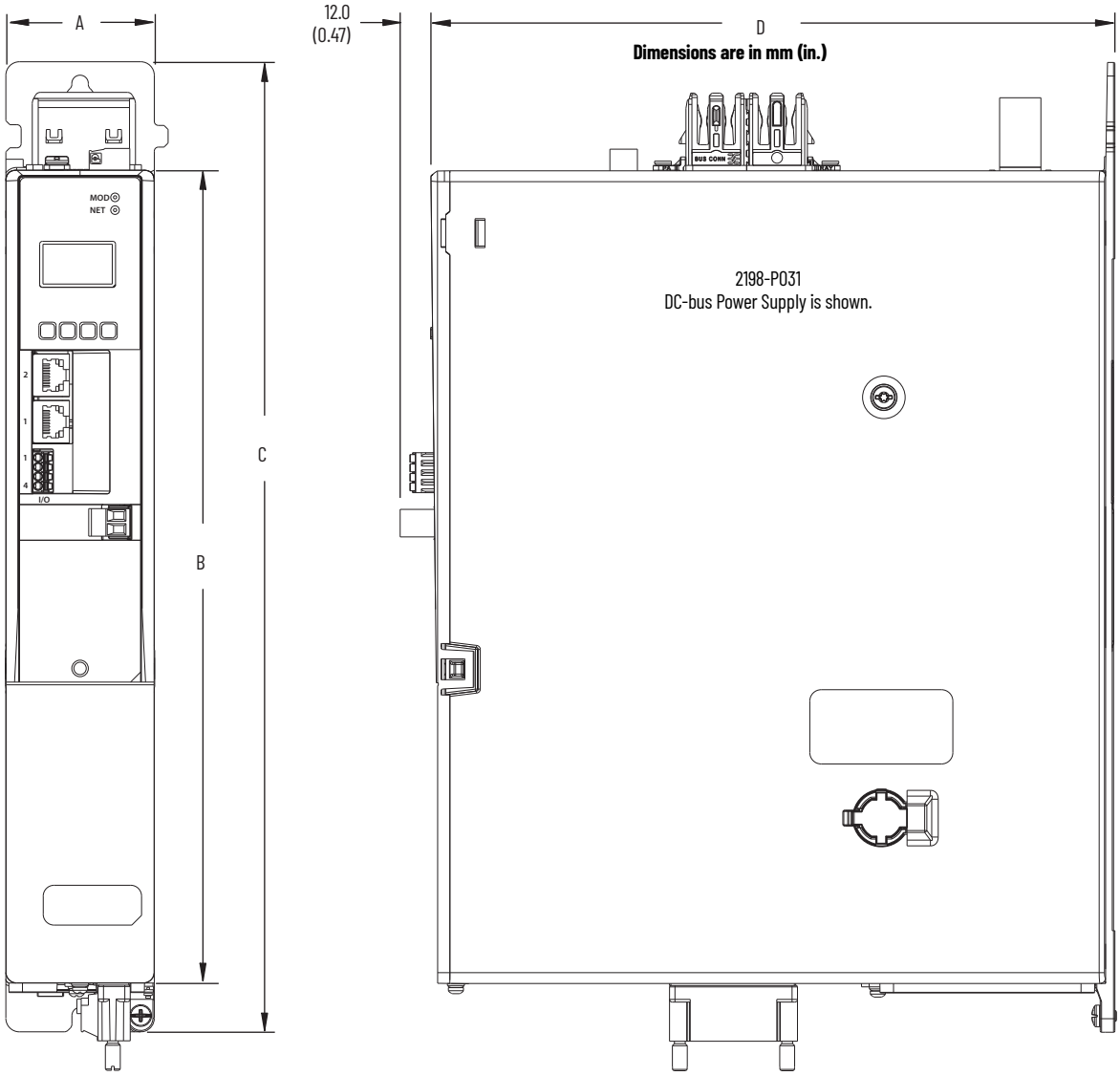
For iTRAK systems, cables from iTRAK power supply to motor modules up to 30 m (98.4 ft) can be used. See the iTRAK System Technical Data, publication 2198T-TD001, for cable specifications.

IMPORTANT System performance was tested at these cable lengths. These limitations also apply when meeting CE requirements.

Dimensions - Kinetix 5700 Servo Drives

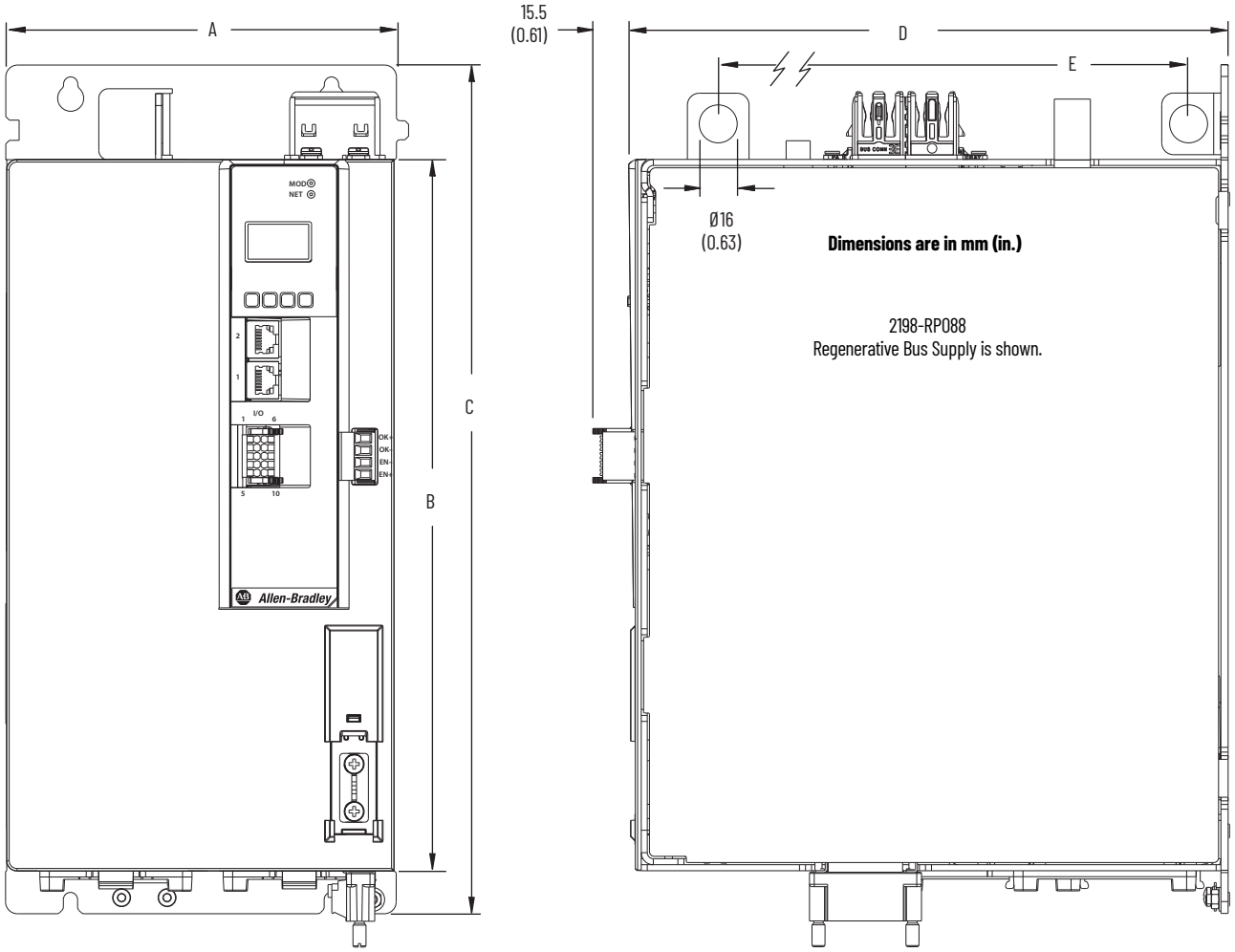
These drawings provide mounting dimensions for Kinetix 5700 power supplies, servo drives, and iTRAK power supply. Also included are drawings showing the impact of compatible motor feedback connector kits on the mounting dimensions. Refer to page 24 for dimensions when using these kits.

DC-bus Power Supply Dimensions



DC-bus Power Supply Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)
2198-P031	55 (2.17)	300 (11.81)	358 (14.09)	252 (9.92)
2198-P070				
2198-P141	85 (3.35)	375 (14.76)	433 (17.04)	
2198-P208				

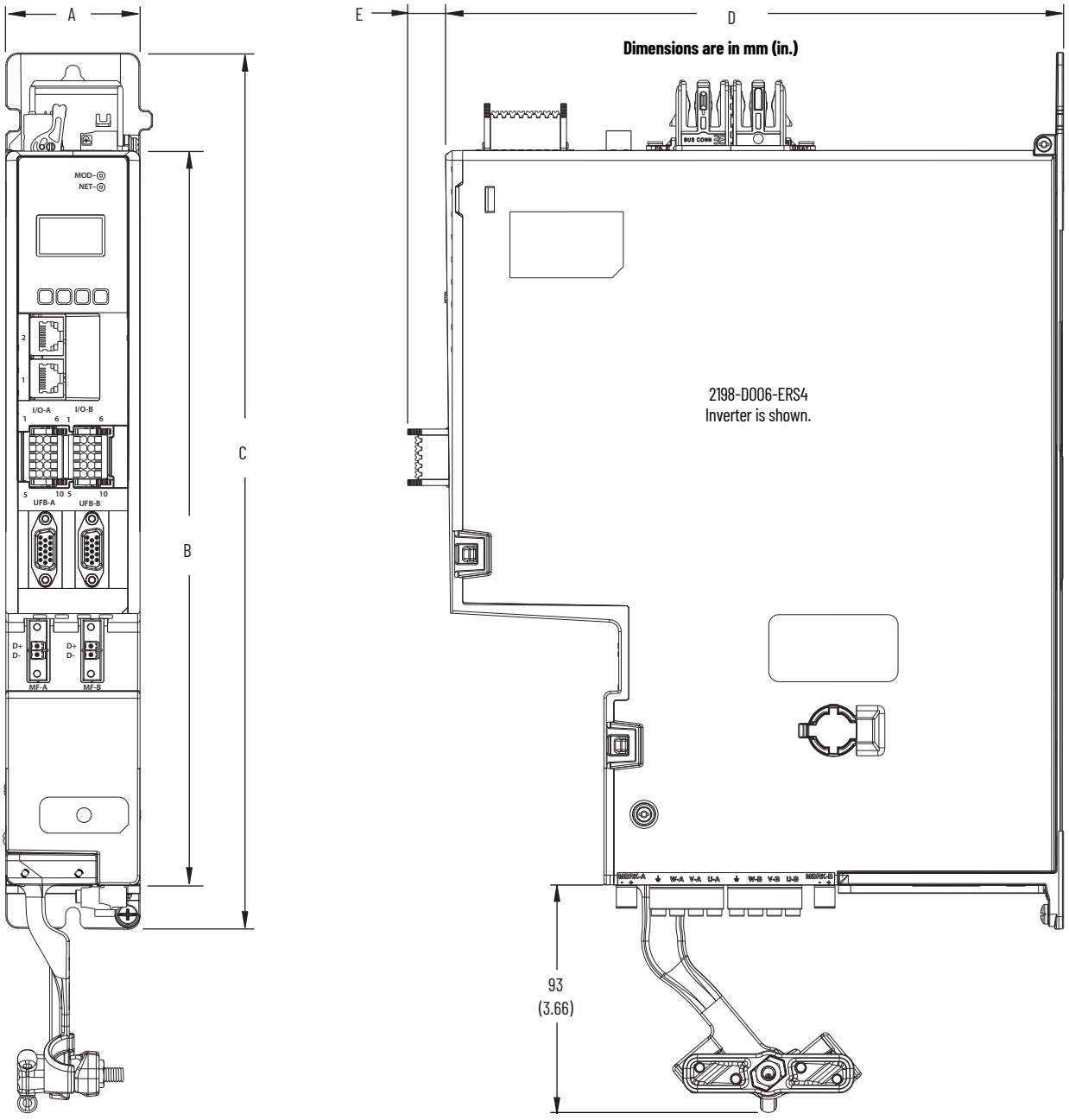
Regenerative Bus Supply Dimensions



Regenerative Bus Supply Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E (1) mm (in.)
2198-RP088	165 (6.50)	300 (11.8)	358 (14.1)	252 (9.92)	198 (7.80)
2198-RP200	275 (10.83)	420 (16.54)	478 (18.82)		225 (8.86), max
2198-RP263	440 (17.32)				233 (9.17), max
2198-RP312					

(1) Maximum distance between lift points.

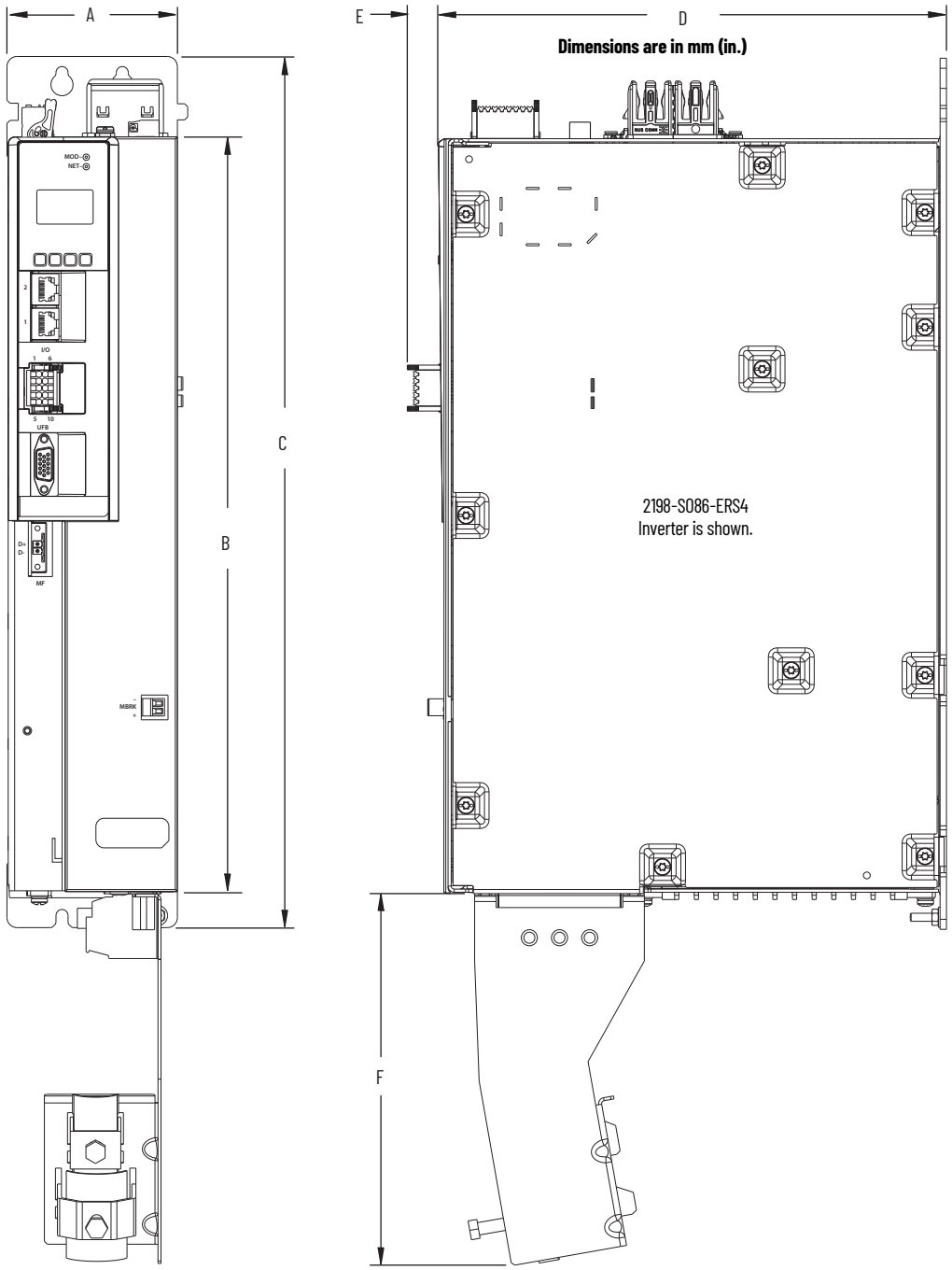
Dual-axis Inverter Dimensions



Dual-axis Inverter Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2198-D006-ERSx	55 (2.17)	300 (11.81)	358 (14.09)	252 (9.92)	15.5 (0.61) [1]
2198-D012-ERSx					
2198-D020-ERSx					
2198-D032-ERSx					
2198-D057-ERSx	85 (3.35)	375 (14.76)	433 (17.0)		

(1) Applies to 2198-D*xxx*-ERS4 and 2198-D*xxx*-ERS3 (series B or later) inverters. 2198-D*xxx*-ERS3 (series A) inverter value is 12.0 (0.47).

Single-axis Inverter Dimensions



Single-axis Inverter Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)
2198-S086-ERS*x*	85.0 (3.35)	375 (14.8)	433 (17.0)	252 (9.92)	15.5 (0.61) (1)	185 (7.28)
2198-S130-ERS*x*						
2198-S160-ERS*x*	100 (3.94)	420 (16.54)	478 (18.82)			
2198-S263-ERS*x*	220 (8.66)	420 (16.54)	478 (18.82)		15.5 (0.61)	132 (5.19)
2198-S312-ERS*x*						

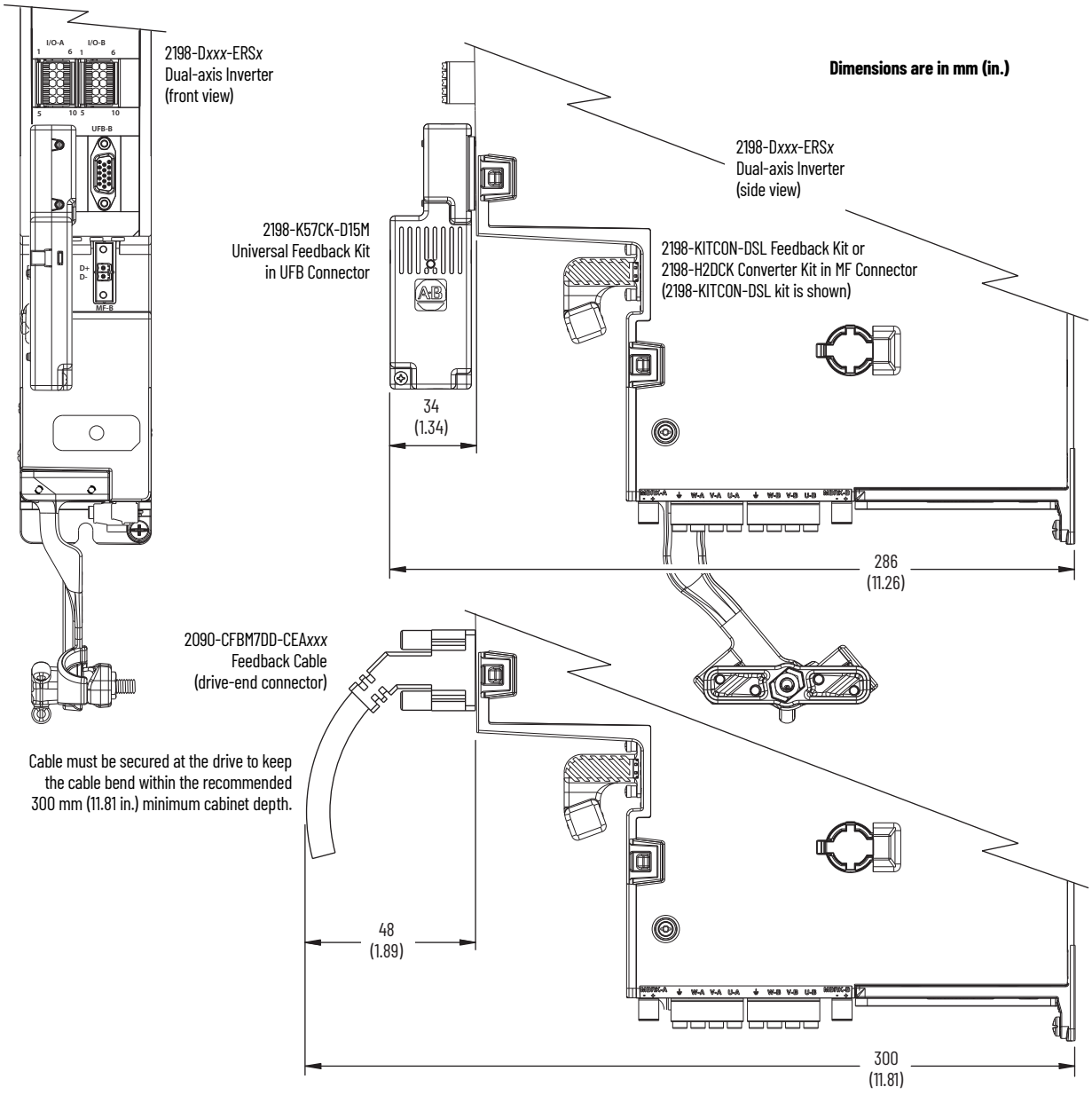
(1) Applies to 2198-S*xxx*-ERS4 and 2198-S*xxx*-ERS3 (series B or later) inverters. 2198-S*xxx*-ERS3 (series A) inverter value is 12.0 (0.47).

The 2198-KITCON-DSL feedback connector kit and 2198-H2DCK feedback converter kit do not affect the mounting dimensions of the drive. No portion of those kits extend out from the front of the drive or below the drive.

IMPORTANT The 2198-K57CK-D15M universal feedback kit and 2090-CFBM7DD (drive-end connector) feedback cable extend out from the UFB connector as shown and covers a portion of the other two kits (when they are used), which requires you to install feedback kits in the MF connector first.

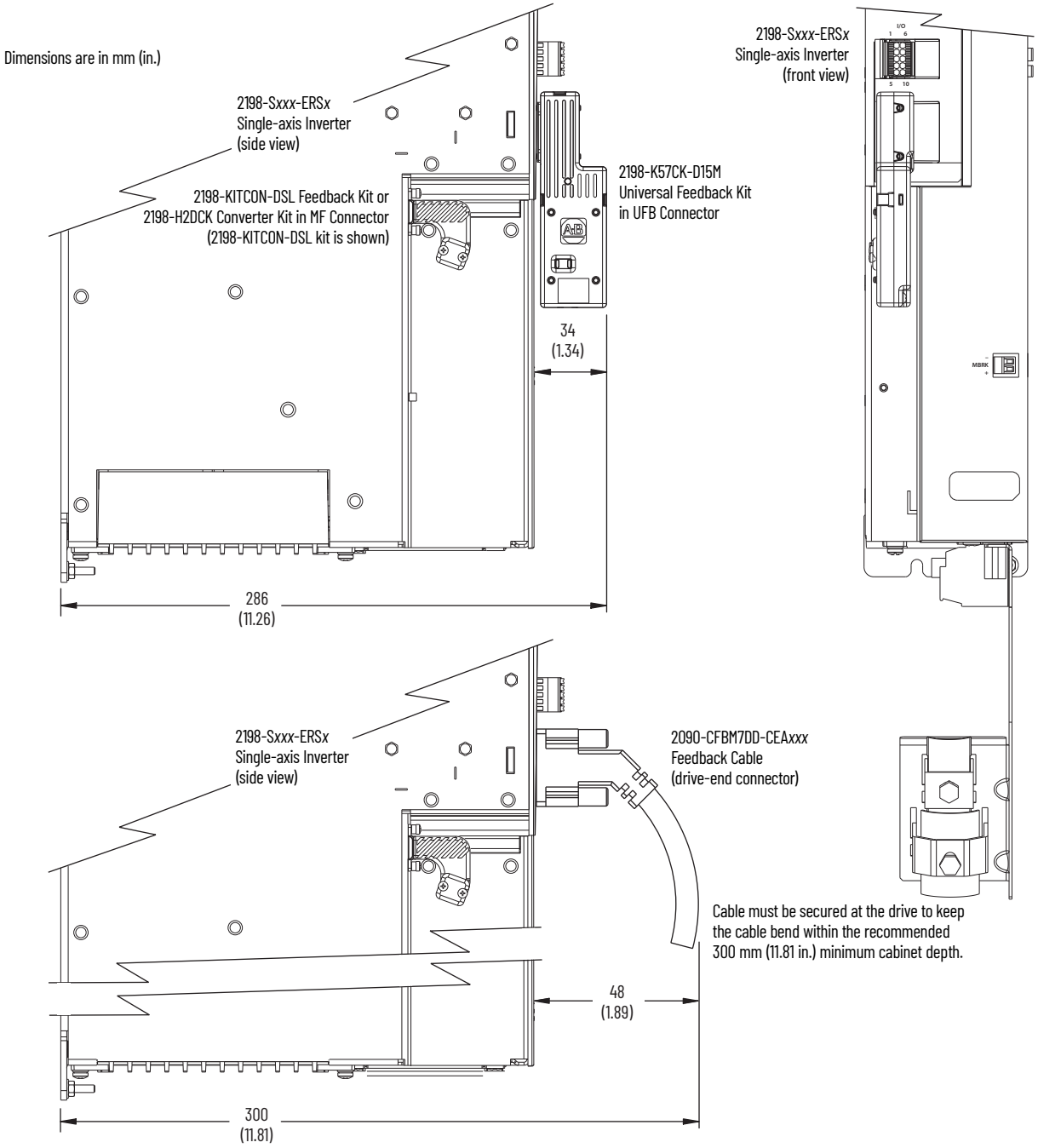
These examples show the 2198-K57CK-D15M universal feedback kit and 2090-CFBM7DD feedback cable that is mounted above (covering) the 2198-KITCON-DSL connector kit in the MF connector. You can replace the 2198-KITCON-DSL feedback kit with the 2198-H2DCK converter kit, if needed, without affecting these mounting dimensions.

Dual-axis Inverter With 2198-K57CK-D15M Universal Feedback Kit



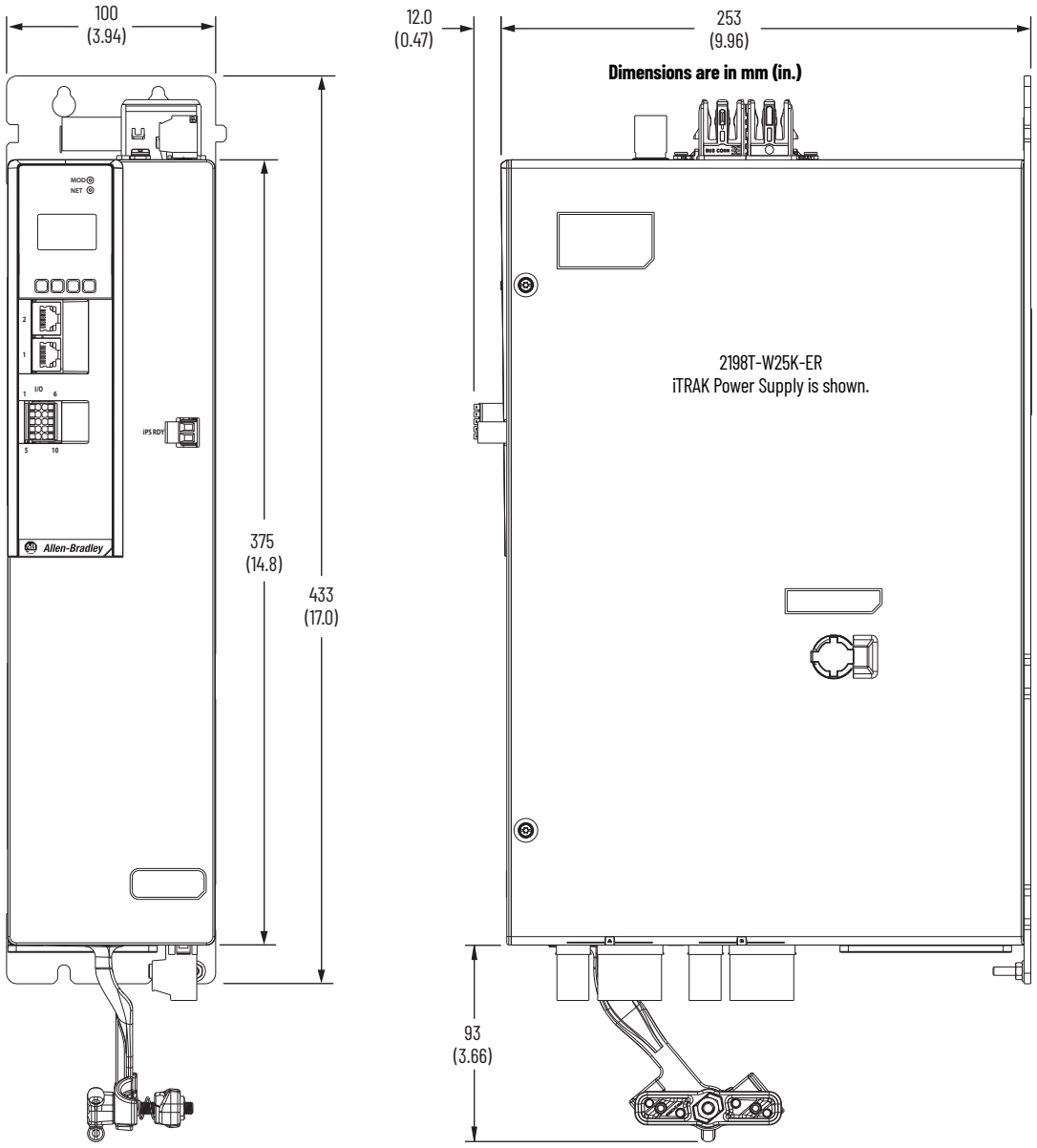
Refer to Universal Feedback Connector Kit on page 36 for motor/actuator compatibility and product dimensions.

Single-axis Inverter With 2198-K57CK-D15M Universal Feedback Kit



Refer to Hiperface-to-DSL Feedback Converter Kit on page 37 for motor/actuator compatibility and page 90 product dimensions.

iTRAK Power Supply Dimensions



Environmental Specifications - Kinetix 5700 Servo Drives

Attribute	Operational Range	Storage Range (nonoperating)
Ambient temperature	0…50 °C (32…122 °F)	-40…+70 °C (-40…+158 °F)
Relative humidity	5…95% noncondensing	5…95% noncondensing
Protection class (IEC 60529)	IP20	
Degree of pollution (IEC 61800-5-1)	2	
Altitude	• 1500 m (4921 ft) derate 3% per 300 m (984 ft) above 1500 m • 2000 m (6562 ft) max, with corner-grounded input power • 3000 m (9843 ft) max, with non corner-grounded input power	3000 m (9843 ft) during transport
Vibration	5…55 Hz @ 0.35 mm (0.014 in.) double amplitude, continuous displacement; 55…500 Hz @ 2.0 g peak constant acceleration	
Shock	15 g, 11 ms half-sine pulse (3 pulses in each direction of 3 mutually perpendicular directions)	

Certifications - Kinetix 5700 Servo Drives

Kinetix 5700 Servo Drives

Agency Certification [1]	Standards
cULus [2]	UL Listed to U.S. and Canadian safety standards (UL 61800-5-1, File E59272).
	Solid-state motor overload protection provides dynamic fold-back of motor current when 110% of the motor rating is reached with a peak current limit based on the peak rating of the motor as investigated by UL to comply with UL 61800-5-1, (UL File E59272).
CE	European Union 2004/108/EC EMC Directive compliant with IEC 61800-3:2004 + A1:2012: Adjustable Speed Electrical Power Drive Systems - Part 3; EMC Product Standard including specific test methods.
	European Union 2006/95/EC Low Voltage Directive compliant with IEC 61800-5-1:2007 - Adjustable speed electrical power drive systems.
Functional Safety	TÜV Certified for Functional Safety: up to SIL CL3, according to IEC 61800-5-2, IEC 61508, and IEC 62061; up to Performance Level PLe and Category 3, according to ISO 13849-1; when used as described in the Kinetix 5700 Servo Drives User Manual, publication 2198-UM002 or the Kinetix 5700 Safe Monitor Functions Safety Reference Manual, publication 2198-RM001.
RCM	Australian Radiocommunications Act, compliant with: • Radiocommunications Act: 1992 (including Amendments up to 2017) • Radiocommunications (Electromagnetic Compatibility) Standard: 2017 • Radiocommunications Labeling ((Compliance Labelling - Incidental Emissions) Notice: 2017
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: • Article 58-2 of Radio Waves Act, Clause 3 • Registration number: KCC-REM-RAA-2198
ODVA	• EtherNet/IP conformance tested • CIP Security™ conformance tested
OSHA	Maximum audible noise from the servo drive system complies with OSHA standard 3074, Hearing Conservation (<85 dBA).

(1) See rok.auto/certifications for declarations of conformity, certificates, and other certification details.
(2) UL has not evaluated the Safe Torque Off options in these products.

Kinetix 5700 iTRAK Power Supply

Agency Certification [1]	Standards
cULus	UL Listed to U.S. and Canadian safety standards (UL 61800-5-1, File E59272 and CSA C22.2 No 274-13).
CE	European Union 2004/108/EC EMC Directive compliant with IEC 61800-3:2004 + A1:2012: Adjustable Speed Electrical Power Drive Systems - Part 3; EMC Product Standard including specific test methods.
	European Union 2006/95/EC Low Voltage Directive compliant with IEC 61800-5-1:2007 - Adjustable speed electrical power drive systems.
RCM	Australian Radiocommunications Act, compliant with: • Radiocommunications Act: 1992 • Radiocommunications (Electromagnetic Compatibility) Standard: 2008 • Radiocommunications Labeling (Electromagnetic Compatibility) Notice: 2008
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: • Article 58-2 of Radio Waves Act, Clause 3 • Registration number: KCC-REM-RAA-2198
OSHA	Maximum audible noise from the servo drive system complies with OSHA standard 3074, Hearing Conservation (<85 dBA).

(1) See rok.auto/certifications for declarations of conformity, certificates, and other certification details.

Accessories - Kinetix 5700 Servo Drives

Kinetix 5700 drive accessories include the accessory modules, passive shunt modules, the encoder output module, line reactors, AC line filters, feedback connector kits, the system mounting toolkit, and shared-bus connector kits.

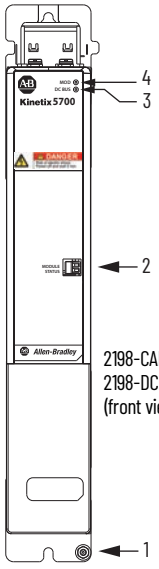
Accessory Modules

The 2198-CAPMOD-2240 capacitor module, 2198-CAPMOD-DCBUS-IO extension module, and 2198-DCBUSCOND-RP312 DC-bus conditioner module are referred to as Kinetix 5700 accessory modules.

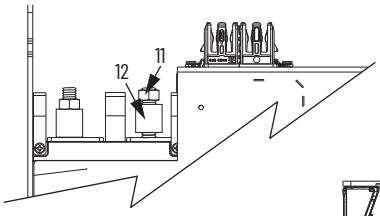
Accessory Module [1] Cat. No.	Description
2198-CAPMOD-2240 capacitor modules are used:	• For energy storage and to extend the DC-bus voltage to another inverter cluster • As connection points for an external active shunt module • In systems with external DC-bus current of up to 104 A, however, can parallel with itself or with another accessory module for up to 208 A.
2198-CAPMOD-DCBUS-IO extension modules are used:	• With another accessory module when the external DC-bus current is >104 A, up to a maximum of 208 A • To extend the DC-bus voltage to another inverter cluster
2198-DCBUSCOND-RP312 DC-bus conditioner modules are used:	• To decrease the voltage stress on isolation components in inverter systems with long cable lengths and other use cases • To extend the DC-bus voltage to another inverter cluster • In systems with external DC-bus current of up to 104 A, however, can parallel with itself or with another accessory module for up to 208 A.

(1) Accessory modules can be used in any Kinetix 5700 drive system configurations with DC-bus power supplies, regenerative bus supplies, and 8720MC-RPS power supplies.

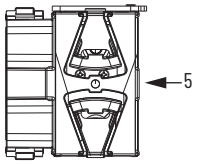
Capacitor Module and DC-bus Conditioner Module Features and Indicators

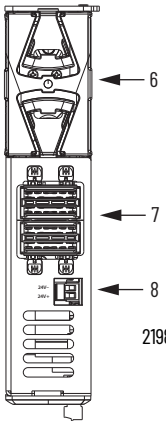


2198-CAPMOD-2240 Capacitor Module and
2198-DCBUSCOND-RP312 DC-bus Conditioner Module
(front view)

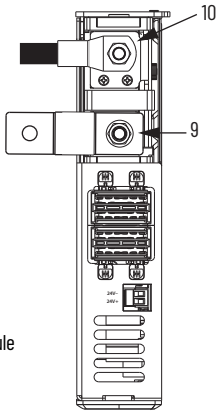


2198-CAPMOD-2240 Capacitor Module and
2198-DCBUSCOND-RP312 DC-bus Conditioner Module
(side view, lug cover removed)





2198-CAPMOD-2240 Capacitor Module and
2198-DCBUSCOND-RP312 DC-bus Conditioner Module
(top views)



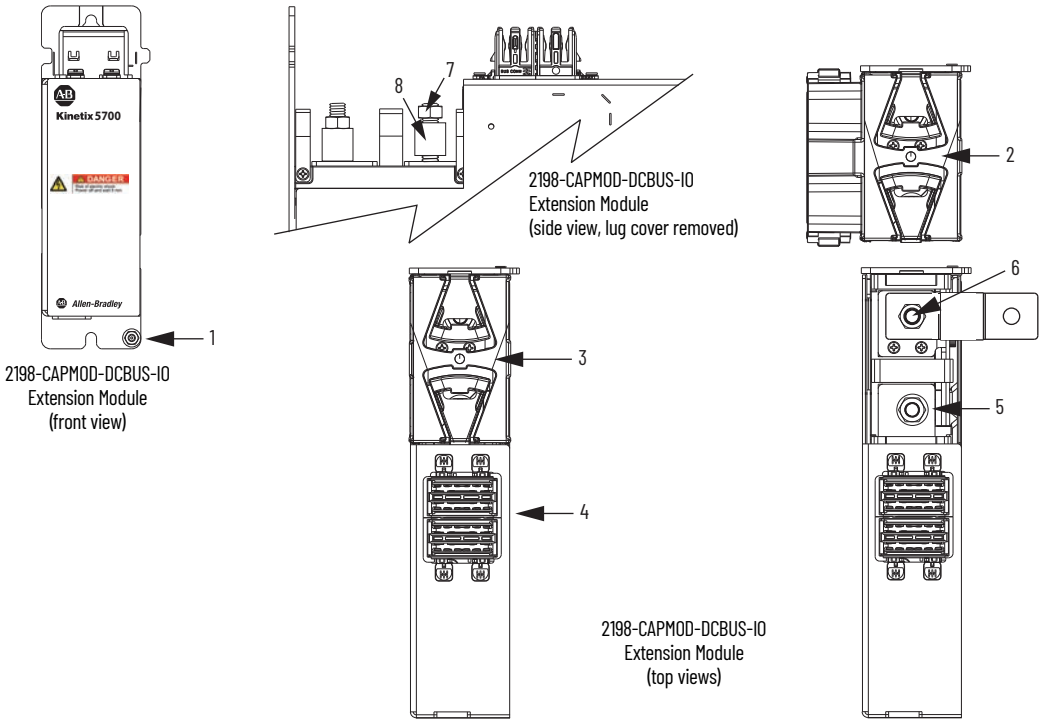
Item	Description
1	Ground stud
2	Module status (MS) connector
3	DC-bus status indicator
4	Module status indicator

Item	Description
5	Stud/lug cover with wires [1]
6	Stud cover without wires
7	DC-bus (DC) connector
8	24V control input power (CP) connector

Item	Description
9	DC– M8 stud (external DC-bus), shown with flexible bus-bar [2]
10	DC+ M8 stud (external DC-bus), shown with wire lug
11	M8 hex nut
12	Lug spacer

(1) This example shows the lug cover oriented for wires exiting to the left (capacitor module is on the far left of the drive configuration). Rotate lug cover 180° when wires exit to the right (capacitor module is on the far right of the drive configuration).
(2) Flexible bus-bars are included with only the 2198-CAPMOD-DCBUS-IO extension module. So, if you have two capacitor modules, two DC-bus conditioner modules, or a capacitor module and DC-bus conditioner module mounted side by side, you must order the 2198-KITCON-CAPMOD2240 or 2198-KITCON-DCBUSCOND connector set separately.

Extension Module Features and Indicators



Item	Description
1	Ground lug
2	Stud/lug cover with wires (1)
3	Stud cover without wires
4	DC-bus (DC) connector

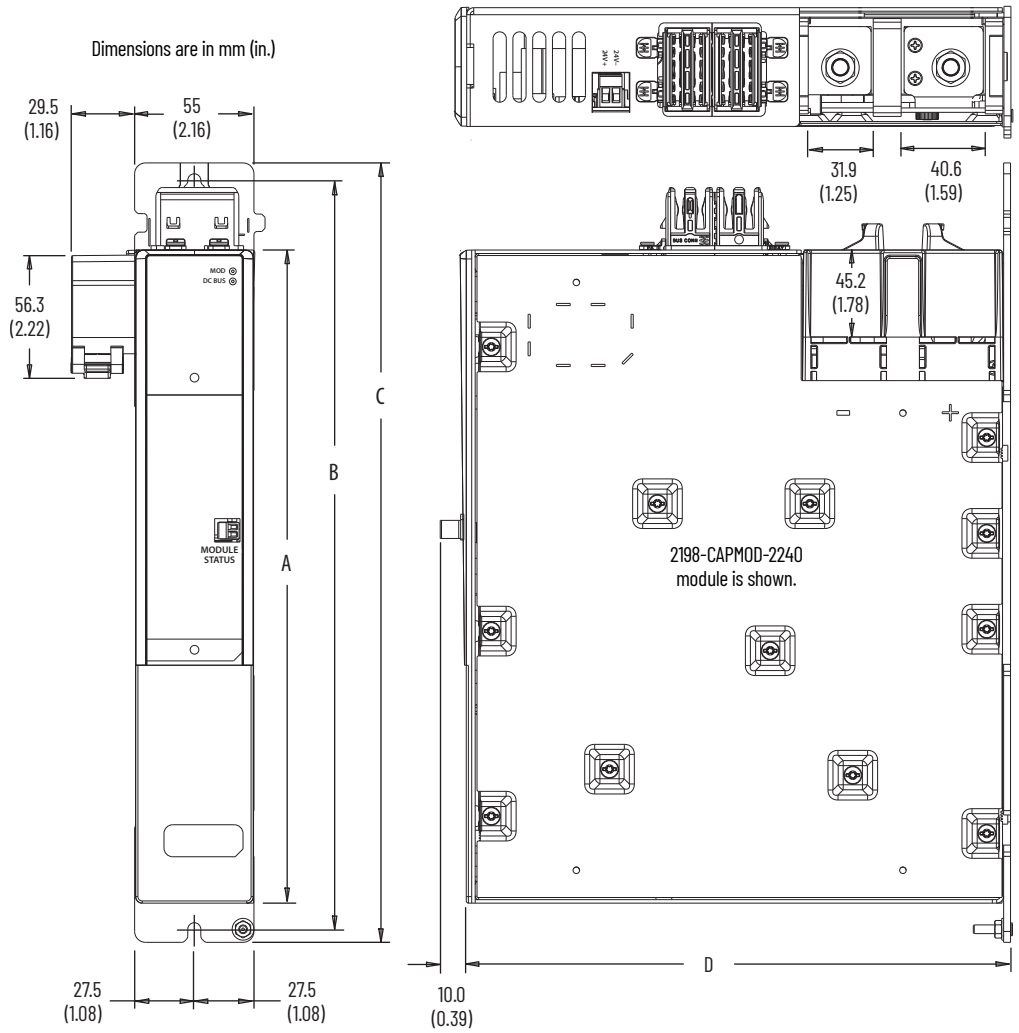
Item	Description
5	DC– M8 stud (external DC-bus)
6	DC+ M8 stud (external DC-bus), shown with flexible bus-bar (2)
7	M8 hex nut
8	Lug spacer

(1) This example shows the lug cover oriented for wires exiting to the left (extension module is on the far left of drive configuration). Rotate lug cover 180° when wires exit to the right (extension module is on the far right of drive configuration).
(2) Flexible bus-bars are included with only the 2198-CAPMOD-DCBUS-IO extension module.

Module Specifications

Module Cat. No.	Voltage Range V DC	Capacitance µF	Energy Storage J	Continuous Current A, avg	Weight, approx kg (lb)
2198-CAPMOD-2240	276...747	2240	734	104	3.3 (7.2)
2198-CAPMOD-DCBUS-IO		–	–	104	1.2 (2.7)
2198-DCBUSCOND-RP312		–	–	104	2.0 (4.4)

Capacitor Module, Extension Module, and DC-bus Conditioner Module Dimensions



Module Cat. No.	A	B (1)	C	D
2198-CAPMOD-2240	300 (11.81)	345 (13.58)	358 (14.09)	253 (10.0)
2198-DCBUSCOND-RP312				
2198-CAPMOD-DCBUS-IO	131 (5.16)	176 (6.93)	189 (7.44)	248 (9.76)

(1) The recommended mounting hardware is M5 (#10-32) steel bolts. Apply 4.0 N•m (35.4 lb•in) maximum torque to each fastener.