Installation Instructions

Original Instructions

Kinetix 5700 DC-bus Power Supply

Catalog Numbers 2198-P031, 2198-P070, 2198-P141, 2198-P208

Summary of Changes

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Updated Kinetix 5700 Servo Drive Circuit Breaker/Fuse specifications to include 140MT Motor Protection Circuit Breakers.	13

About the DC-bus Power Supply

The Kinetix® 5700 DC-bus (converter) power supply with 400V-class three-phase AC input provides continuous output power and current to servo drives for applications with requirements in the range of 7…46 kW and 10.5…69.2 A, respectively. For additional output power (kW) you can install two or three 2198-P208 DC-bus power supplies. You can also extend the DC-bus to additional inverter clusters via accessory modules.

See the Kinetix 5700 DC-bus Power Supply Servo Drives User Manual, publication 2198-UM002, for detailed information on wiring, applying power, troubleshooting, and integration with ControlLogix® EtherNet/IP communication modules or CompactLogix™ 5370 controllers.

Catalog Number Explanation

This publication applies to the following Kinetix 5700 DC-bus Power Supply DC-bus power supplies.

DC-bus Power Supply Catalog Numbers

DC-bus Power Supply Cat. No.	Module Width mm	Input Voltage	Continuous Output Power kW	Continuous Output Current A_{DC} rms
2198-P031	55	195…528V rms, three-phase	7	10.5
2198-P070			17	25.5
2198-P141	85		31	46.9
2198-P208			46	69.2

Before You Begin

Remove all packing material, wedges, and braces from within and around the components. After unpacking, check the item nameplate catalog number against the purchase order.

Parts List

The DC-bus power supplies ship with the following:

- DC-bus end caps
- Wiring plug connector set for mains input power (IPD), 24V control input power (CP), digital inputs (IOD), shunt power (RC), and contactor enable (CED)
- Wiring plug connector for shunt power (RC) connections installed on the drive
- These installation instructions, publication 2198-IN009

Replacement connector sets are also available. See the Kinetix 5700, 5500, 5300, 5100 Servo Drives Specifications Technical Data, publication KNX-TD003, for more information.

Remove the Ground Screw in Select Power Configurations

Remove the ground screw when using ungrounded, corner-grounded, and impedance-grounded power configurations.

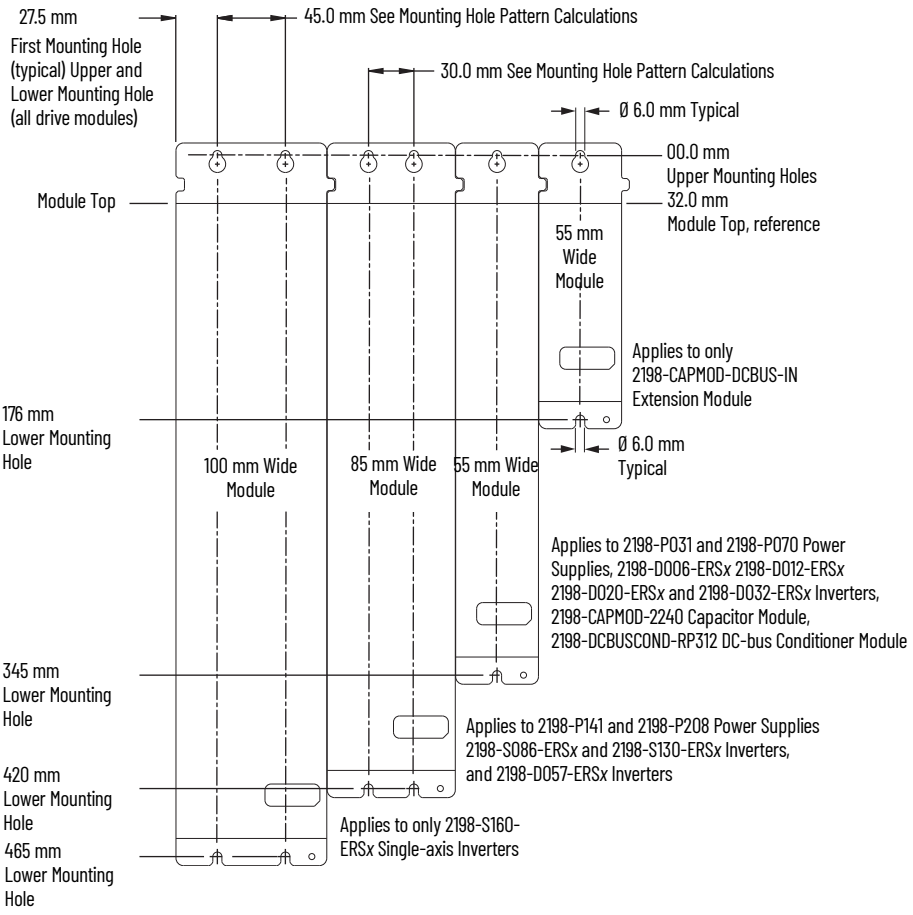
IMPORTANT If you have grounded-wye power distribution, you do not need to remove the screw. Go to Install the DC-bus Power Supply on page 3.
EMC performance can be affected if you remove the ground screw.

We recommend that you remove the ground screw before mounting the power supply to the panel. Place the power supply on its side, on a solid surface equipped as a grounded static-safe workstation.

ATTENTION: To avoid personal injury, the ground-screw access door must be kept closed when power is applied. If power was present, and then removed, wait at least 5 minutes for the DC-bus voltage to dissipate, and verify that no DC-bus voltage exists before accessing the ground screw.

To access the ground screw, open the small plastic door on the right side of the module.

Kinetix 5700 Mounting Hole Patterns



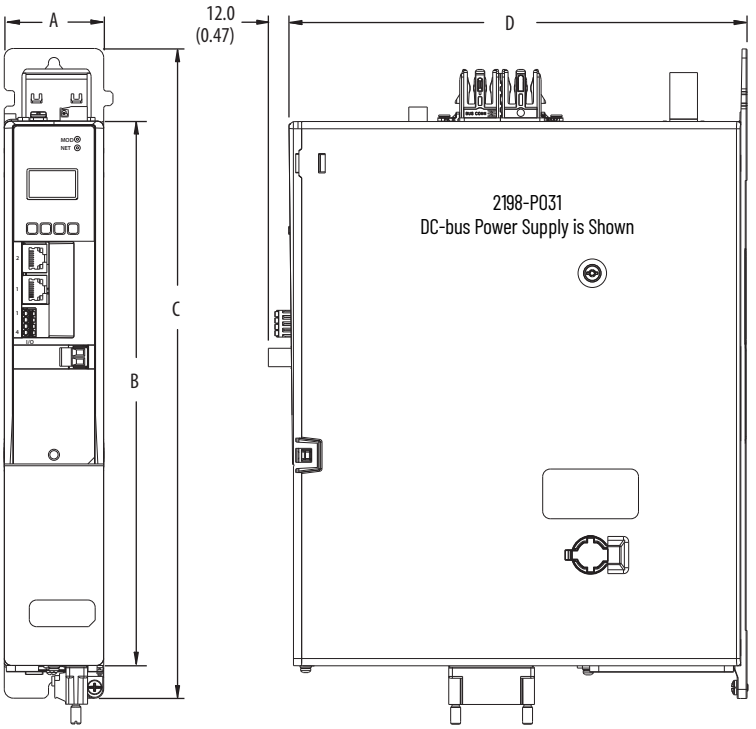
When your Kinetix 5700 system configuration includes 2198-S263-ERS*x* or 2198-S312-ERS*x* single-axis inverters, see the Kinetix 5700 Servo Drives User Manual, publication 2198-UM002, for those mounting hole patterns.

Also available to assist you with mounting holes is the Kinetix 5700 System Mounting Toolkit, catalog number 2198-K5700-MOUNTKIT.

Product Dimensions

Refer to the Kinetix 5700, 5500, 5300, 5100 Servo Drives Specifications Technical Data, publication KNX-TD003, for product dimensions of all Kinetix 5700 drive modules.

Dimensions are in mm (in.)



DC-bus Power Supply Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)
2198-P031	55 (2.17)	300 (11.8)	358 (14.1)	252 (9.9)
2198-P070				
2198-P141	85 (3.35)	375 (14.8)	433 (17.0)	
2198-P208				

Wiring Requirements

Wire must be copper with 75 °C (167 °F) minimum rating. Phasing of mains AC power is arbitrary and earth ground connection is required for safe and proper operation.

IMPORTANT The National Electrical Code and local electrical codes take precedence over the values and methods provided.

DC-bus Power Supply Wiring Requirements

DC-bus Power Supply Cat. No.	Description	Connects to Terminals		Wire Size mm ^{2} (AWG)	Strip Length mm (in.)	Torque Value N•m (lb•in)
		Pin	Signal			
2198-P031	Mains input power	⏚ L3 L2 L1	⏚ L3 L2 L1	6…10 (1) (10…8)	10.0 (0.39)	0.5…0.8 (4.4…7.1)
2198-P070				6…10 (2) (10…8)		
2198-P141 2198-P208				10…35 (8…2)	20.0 (0.79)	2.5…4.5 (22…40)
2198-P*xxx*	PELV/SELV 24V power (connector plug)	CP-1 CP-2	24V+ 24V–	0.5…4 (20…12)	7.0 (0.28)	0.22…0.25 (1.9…2.2)
	DC Bus power	Bus bar	DC– DC+	N/A (3)	N/A (3)	N/A (3)
	Contactor enable	EN– EN+	CONT EN– CONT EN+	0.14…2.5 (26…12)	7.0 (0.28)	0.4…0.5 (3.5…4.4)
	Shunt resistor	RC-1 RC-2	SH DC+	1.5…6 (16…10)	12.0 (0.47)	0.5…0.6 (4.5…5.3)
	Digital inputs	IOD-1 IOD-2 IOD-3 IOD-4	IN1 COM IN2 SHLD	0.14…1.5 (26…16)	10.0 (0.39)	N/A (4)

(1) Applies to solid wire. If using stranded wire, the maximum wire size is 6 mm^2 (10 AWG).

(2) Applies to solid wire. If using stranded wire, the maximum wire size is 6 mm^2 (10 AWG). To meet CE requirements above 45 °C (113 °F) for 6 mm^2 stranded wires, single-core copper conductors must be used with 90 °C minimum rating.

(3) Shared DC-bus power connections are always made from drive to drive over the bus-bar connection system. These terminals do not receive discrete wires.

(4) This connector uses spring tension to hold wires in place.

ATTENTION: To avoid personal injury and/or equipment damage, observe the following:

- Make sure that installation complies with specifications regarding wire types, conductor sizes, branch circuit protection, and disconnect devices. The National Electrical Code (NEC) and local codes outline provisions for safely installing electrical equipment.
- Use motor power connectors only for connection purposes. Do not use them to turn the unit on and off.
- Ground shielded power cables to prevent potentially high voltages on the shield.

Circuit Breaker/Fuse Specifications

The Kinetix 5700 power supplies use internal solid-state motor short-circuit protection and, when protected by suitable branch circuit protection, are rated for use on a circuit that can deliver up to 200,000 A (fuses) and 65,000 A (circuit breakers).

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 that the selected components are properly coordinated and meet acceptable codes, which includes 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.

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.	Molded Case CB Cat. No.
2198-P031	195…528V AC rms	16	1489-M3D250	–	140M-D8E-C25 140MT-D9E-C25	140G-G6C3-C25
2198-P070		40	–	1492-SPM3D400	140M-F8E-C45	140G-G6C3-C50
2198-P141		75	–	1492-SPM3D630	140MG-H8E-C60	140G-G6C3-C90
2198-P208		110	–	–	140MG-H8E-D10	140G-G6C3-D12

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) Self Protected CMC Cat. No.	Molded Case CB Cat. No.
2198-P031	195…528V AC rms	LPJ-15SP (15A)	1489-M3D250	140M-D8E-C25 140MT-D9E-C25	140G-G6C3-C25
2198-P070		LPJ-40SP (40A)	–	140M-F8E-C45	140G-G6C3-C50
2198-P141		LPJ-70SP (70A)	–	–	140G-G6C3-C90
2198-P208		LPJ-100SP (100A)	–	–	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).

Specifications

Attribute	2198-P031	2198-P070	2198-P141	2198-P208
Surrounding air temperature Operating Storage	0…50 °C (32…122 °F) -40…+70 °C (-40…+158 °F)			
Weight, kg (lb) approx	4.33 (9.55)	4.42 (9.74)	6.91 (15.2)	7.04 (15.5)
Short-circuit current rating	200,000 A rms symmetrical			
Branch-circuit short-circuit protection	Integral solid-state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the Nation al Electric Code (NEC) and any additional local codes.			
Leakage current	• Kinetix 5700 drives produce leakage current in the protective-earthing conductor that exceeds 3.5 mA AC and/or 10 mA DC. The minimum size of the protective-earthing (ground) conductor used in the application must comply with local safety regulations for high-protective-earthing conductor current equipment. • Kinetix 5700 drives produce DC current in the protective-earthing conductor and can reduce the ability of a residual current device (RCD) or residual current monitor (RCM) of type A or AC to provide protection for the drive module and other equipment in the installation.			

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Kinetix 5700, 5500, 5300, 5100 Servo Drives Specifications, publication KNX-TD003	Provides product specifications for Kinetix Integrated Motion over the EtherNet/IP network and EtherNet/IP networking servo drive families.
Kinetix Rotary and Linear Motion Cable Specifications Technical Data, publication KNX-TD004	Product specifications for Kinetix 2090 motor and interface cables.
Kinetix 3, 300, 350, 2000, 6000, 6200, 6500, 7000 Servo Drives Specifications, publication KNX-TD005	Provides product specifications for Kinetix Integrated Motion over the EtherNet/IP network (Kinetix 6500 and Kinetix 350), Integrated Motion over Sercos interface (Kinetix 6200, Kinetix 6000, Kinetix 2000, and Kinetix 7000), and component (Kinetix 3) servo drive families.
Kinetix 5700 Servo Drives User Manual, publication 2198-UM002	Provides information on how to install, configure, startup, and troubleshoot your Kinetix 5700 servo drive system.
AC Line Filter Installation Instructions, publication 2198-IN003	Provides information on how to install and wire the AC line filter for Kinetix 5500 and Kinetix 5700 servo drives.
Kinetix 5700 Passive Shunt Modules Installation Instructions, publication 2198-IN011	Provides information on how to install and wire Kinetix 5700 external passive shunt modules.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.

You can view or download publications at rok.auto/literature.