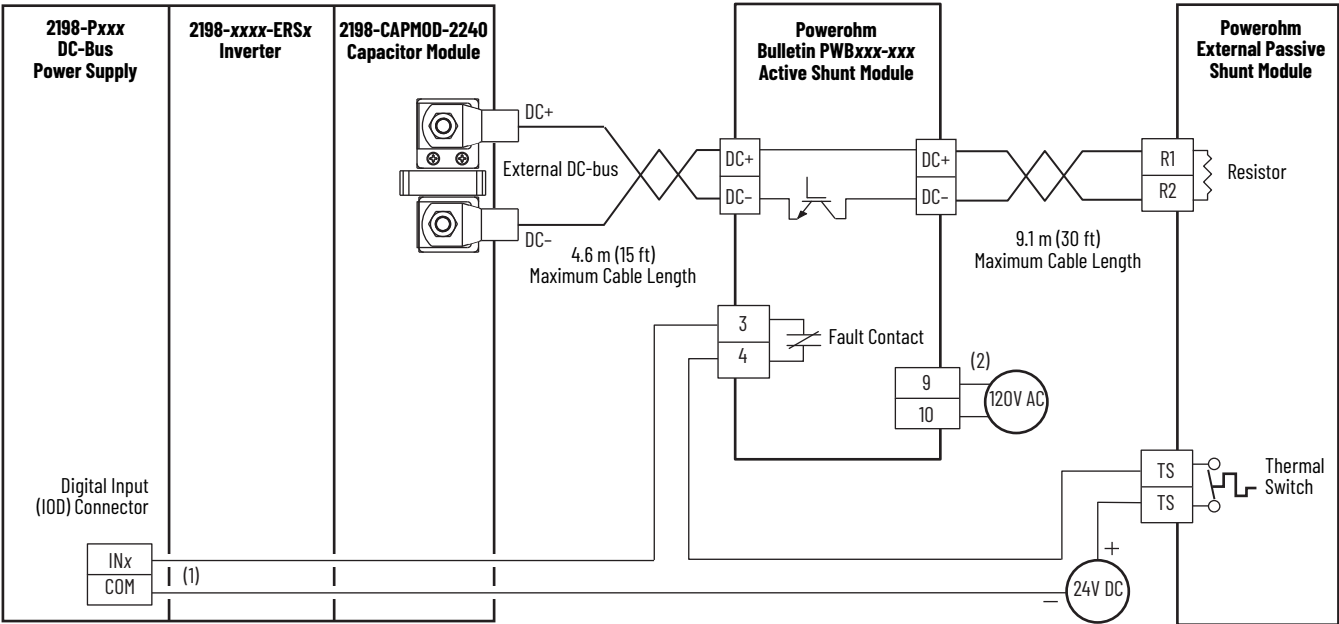


Figure 23 - 2198-Pxxx Power Supply with External Active Shunt (external brake resistor)



(1) Configure any available digital input as Shunt Thermal Switch OK. See the Kinetix 5700 Servo Drives User Manual, publication [2198-UM002](#), for more information on configuring digital inputs.
(2) Powerohm PWB050 and PWB050-800 shunts require 120V AC between pins 9 and 10 to supply power to the cooling fans.

See Knowledgebase document [1082777](#) for more information on wiring to these Powerohm Bulletin PWBxxx active shunts.

See the Powerohm documentation included with your Bulletin PKB or PWB shunt module to install, wire, and configure the module.

- To avoid nuisance thermal overload trips, configure Bulletin PKB and PWB active-shunt modules to the highest shunt turn-on voltage setting. The recommended setting for Line Voltage Level Jumper is JP5.
- Configure Bulletin PKB and PWB active-shunt modules in Internal (automatic) mode. Unless an external enable signal is provided, configure the Brake Enable Jumper in Internal (automatic) mode (JP6 is in the downward position).

Power Supply Ground Screw Setting

The 2198-Pxxx DC-bus power supply has a factory-installed ground screw for grounded-wye power distribution. This table summarizes the ground screw settings for the 2198-Pxxx DC-bus power supply.

Table 26 - Ground Screw Settings for the DC-bus Power Supply

Ground Configuration	2198-Pxxx DC-bus Power Supply
Grounded (wye)	Ground screw installed (default setting) ⁽¹⁾
• Impedance grounded • Corner grounded • AC-fed ungrounded	Remove ground screw/jumper

(1) Ground screw is factory installed.

IMPORTANT If you have grounded-wye power distribution in your facility, do not remove the ground screw from the DC-bus power supply. Remove the ground screw when using ungrounded, corner-grounded, or impedance-grounded power.

System Sizing

These limitations apply to systems supplied by a single 2198-Pxxx or multiple 2198-P208 DC-bus power supplies:

- DC-bus power supplies to comply with IEC 61800-3 (category C3) requirements when used with 2198-DBRxx-F line filters.
- Combined motor power cable length for all axes on the same DC bus must not exceed:
 - 1200 m (3937 ft) for 2198-P070, 2198-P141, and 2198-P208, DC-bus power supplies when paired with 2198-DBRxx-F line filters
 - 400 m (1312 ft) for 2198-Pxxx DC-bus power supplies when paired with 2198-DBxx-F line filters
 - 400 m (1312 ft) for 2198-P031 DC-bus power supplies when paired with 2198-DBxx-F or 2198-DBRxx-F line filters
 See the Kinetix 5700 Servo Drives User Manual, publication [2198-UM002](#), for additional motor power cable-length limitations.
- The total system capacitance limit is based on the power supply catalog number. DC-bus groups must not exceed the limits as defined in [Kinetix and PowerFlex Drive Specifications](#) on [page 61](#).
- No more than three 2198-P208 DC-bus power supplies can be used to increase the converter power.
- If using the 24V DC shared-bus connection system, add another 24V power supply when control input power to a cluster of drive modules exceeds 40 A.
- The Kinetix 5700 system can have multiple drive clusters in a single DC-bus group. See the Kinetix 5700 Servo Drives User Manual, publication [2198-UM002](#), for more information on extended clusters.

See the Kinetix 5700 Servo Drives User Manual, publication [2198-UM002](#), for additional information on system sizing guidelines.

The motor required for a particular application determines the drive required for full motor performance. For best results, use Motion Analyzer system sizing and selection tool, available at <https://motionanalyzer.rockwellautomation.com/>.

Capacitance Sizing

Total system capacitance is the sum of all internal capacitance values from each of the drive modules (AC drives, single-axis inverters, dual-axis inverters, power supplies, and capacitor modules) in the same DC-bus group.

The total system capacitance must be less than the maximum supported DC-bus capacitance value of the power supply (See [Kinetix and PowerFlex Drive Specifications](#) on [page 61](#)).

IMPORTANT	If your total system capacitance value exceeds the maximum supported capacitance value of the DC-bus power supply, perform one of the following: • Increase the size of the 2198-Pxxx DC-bus power supply • Use multiple 2198-P208 DC-bus power supplies (1...3 power supplies are possible with only 2198-P208 power supply) • Decrease the total system capacitance by removing inverters or capacitor modules from the DC-bus group • Separate clusters into multiple DC-bus groups
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All drives have a DC-bus capacitance that is proportional to their power ratings. When used in a common DC-bus configuration, these capacitors are directly connected in parallel. This connection results in the DC-bus ripple being shared proportional to the power rating of the drive. When the ratio of the capacitance to the drive-rated current is consistent, it provides the best DC-bus ripple sharing.

For 400/480V AC, the target ratio is 40 $\mu\text{F/A} \pm 10\%$ or greater. For all drives supported in this publication, with the exception of the PowerFlex 520-Series drives, the target ratio is met when a capacitor module is used to extend the DC-bus, proper DC-bus cable length guidelines are followed, and low-inductance DC cable is used. See [DC-bus Connections](#) on [page 10](#) for more information.

Circuit Protection

Do not daisy chain drives to share DC-bus fusing. Configure the shared DC-bus in a star configuration to enable proper fusing. Use fast semiconductor fuses in the DC links to minimize destructive energy in the event of a part or control malfunction. Size fuses to handle large peak currents at the end of precharge.

- See [Kinetix and PowerFlex Drive Specifications](#) on [page 61](#) for the recommended common DC-bus circuit protection devices.
- See the Kinetix 5700 Servo Drives User Manual, publication [2198-UM002](#), for recommended AC input circuit protection for the Bulletin 2198 power supply.

Kinetix and PowerFlex Drive Specifications

This appendix provides Kinetix® and PowerFlex® drive specifications and includes DC input currents, recommended DC input fuses (manufacturer catalog numbers), and internal drive DC-bus capacitance.

Kinetix 5700 Drive Specifications

The total system capacitance must be less than the maximum supported DC-bus capacitance value of the power supply.

Table 50 - Kinetix 5700 Power Supply Capacitance

Power Supply	Power Supply Cat. No.	Supported Capacitance, max μF	Internal Capacitance μF	Capacitive Energy Absorption J
Single DC-bus Power Supply	2198-P031	8,000	585	129
	2198-P070		780	172
	2198-P141	13,000	1640	362
	2198-P208		2050	453
Multiple DC-bus Power Supplies	2198-P208 x 2	26,000	4100	906
	2198-P208 x 3	39,000	6150	1359
Regenerative Bus Supplies	2198-RP088	9,000	940	207
	2198-RP200	15,000	2460	542
	2198-RP263	25,000	4510	994
	2198-RP312		5740	1265

Table 51 - Kinetix 5700 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
DC input current @ 458...747V DC	45.7 A _{DC}	69.0 A _{DC}	92.3 A _{DC}	164.0 A _{DC}	207.0 A _{DC} ⁽¹⁾
Internal Capacitance	560 μF	840 μF	1120 μF	2050 μF	2050 μF

(1) UL tested to 175.0 A_{DC}.

Table 52 - Kinetix 5700 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
DC input current @ 458...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.

Table 53 - DC-bus Power Supply Specifications

Attribute	2198-P031	2198-P070	2198-P141	2198-P208
AC input voltage	324...528V rms, three-phase (480V nom)			
AC input frequency	47...63 Hz			
Main AC input current ⁽¹⁾ 324...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

Table 53 - DC-bus Power Supply Specifications

Attribute	2198-P031	2198-P070	2198-P141	2198-P208
Peak AC input current 324...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	458...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 (480V rms, three-phase)	7.0 kW	17.0 kW	31.0 kW	46.0 kW
Peak output power to bus Nom (480V rms, three-phase)	21.0 kW	46.0 kW	93.0 kW	138.0 kW
Bus overvoltage - 480V, nom AC input	832V DC			
Internal shunt resistance	37.5 Ω		13.5 Ω	
Internal shunt power	75 W		200 W	
Shunt on	775V plus 30V x bus regulator capacity/utilization ⁽⁴⁾			
Shunt off	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, see Kinetix Servo Drives Specifications Technical Data, publication [KNX-TD003](#).

(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.