## AC Line Filters


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### About the AC Line Filters

This publication provides wiring and installation instructions for the AC line filters used with the Kinetix® 5500 and Kinetix 5700 servo drive systems and the Kinetix 5700 iTRAK® power supply. For more information on installing and wiring your Kinetix 5500 or Kinetix 5700 drive system, refer to the drive-family user manual listed in Additional Resources on page 10.

### Before You Begin

For general guidelines when laying out your panel and mounting your AC line filter, refer to the System Design for Control of Electrical Noise Reference Manual, publication GMC-RM001.

For guidelines specific to your application, refer to your drive-family user manual listed in Additional Resources on page 10.

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**ATTENTION:** To avoid personal injury or damage to equipment due to hazardous voltages, follow these guidelines when installing your AC line filter. NEC and local regulations always take precedence:

- Disconnect mains power before installation.
- Verify that the rated voltage is compatible with the local supply voltage.
- Connect the earth ground connection first.
Install the AC Line Filter

Mount the line filter to the cabinet panel with hardware as specified in the table below.

<table>
<thead>
<tr>
<th>AC Line Filter Cat. No.</th>
<th>Mounting Bolts</th>
<th>Torque Value N•m (lb•in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2198-DBR20-F</td>
<td>2198-DB08-F</td>
<td>M5 (#10-32)</td>
</tr>
<tr>
<td></td>
<td>2198-DB20-F</td>
<td>2.0 (17.7)</td>
</tr>
<tr>
<td>2198-DBR40-F</td>
<td>2198-DBR40-F</td>
<td>M6 (1/4x20)</td>
</tr>
<tr>
<td>2198-DBR90-F</td>
<td>2198-DB80-F</td>
<td>4.5 (39.8)</td>
</tr>
<tr>
<td>2198-DBR200-F</td>
<td>2198-DB90-F</td>
<td>M10 (3/8x16)</td>
</tr>
<tr>
<td></td>
<td>2198-DB290-F</td>
<td>30 (266)</td>
</tr>
</tbody>
</table>

See the System Design for Control of Electrical Noise Reference Manual, publication GMC-RM001, for proper high-frequency (HF) bonding techniques to improve overall system performance.

Wire the AC Line Filter

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

**IMPORTANT** The National Electrical Code and local electrical codes take precedence over the values and methods provided. When wiring the line filter for single-phase operation (Kinetix 5500 drives only), do not make connections to the L3 terminals. Line and load designations must be observed to meet product specifications.

### AC Line Filter Wiring Examples (Kinetix 5500 drives)

![Kinetix 5500 drive input power (IPD) connections for three-phase operation.](image1)

![Kinetix 5500 drive input power (IPD) connections for single-phase operation.](image2)
AC Line Filters

AC Line Filter Wiring Examples (Kinetix 5700 drives)

- Bonded Cabinet
- Ground Bar
- Circuit Protection
- Mains Contactor
- AC Input
- Line
- Load
- DC-bus Power Supplies in Parallel
  - Kinetix 5700 drive input power (IPD) connections for three-phase operation.
  - 2198-P208 DC-bus Power Supply
- Mains
- AC Input
- Line Reactor
- 1321-3Rx80-B
- 2198-DBxx-F
- 2198-DBRxx-F
- 2198-DBR200-F
- 2198-DB290-F
- 2198-P208
- 2198-Pxxx
- 2198-RPxxx
- Regenerative Bus Supply
- DC-bus Power Supplies in Parallel
  - Kinetix 5700 drive input power (IPD) connections for three-phase operation.
  - 2198-P208 DC-bus Power Supply
- Bonded Cabinet
- Ground Bar
- Circuit Protection
- Mains Contactor
- AC Input
- Line
- Load
- DC-bus Power Supplies in Parallel
  - Kinetix 5700 drive input power (IPD) connections for three-phase operation.
  - 2198-P208 DC-bus Power Supply
- Bonded Cabinet
- Ground Bar
- Circuit Protection
- Mains Contactor
- AC Input
- Line
- Load
- DC-bus Power Supplies in Parallel
  - Kinetix 5700 drive input power (IPD) connections for three-phase operation.
  - 2198-P208 DC-bus Power Supply
- Bonded Cabinet
- Ground Bar
- Circuit Protection
- Mains Contactor
- AC Input
- Line
- Load
- DC-bus Power Supplies in Parallel
  - Kinetix 5700 drive input power (IPD) connections for three-phase operation.
  - 2198-P208 DC-bus Power Supply
- Bonded Cabinet
- Ground Bar
- Circuit Protection
- Mains Contactor
- AC Input
- Line
- Load
- DC-bus Power Supplies in Parallel
  - Kinetix 5700 drive input power (IPD) connections for three-phase operation.
  - 2198-P208 DC-bus Power Supply
- Bonded Cabinet
- Ground Bar
- Circuit Protection
- Mains Contactor
- AC Input
- Line
- Load
- DC-bus Power Supplies in Parallel
  - Kinetix 5700 drive input power (IPD) connections for three-phase operation.
  - 2198-P208 DC-bus Power Supply
# AC Line Filters

## AC Line Filter Wiring Specifications

<table>
<thead>
<tr>
<th>AC Line Filter Cat. No.</th>
<th>Signal</th>
<th>Recommended Wire Size mm², AWG</th>
<th>AC Line Filter Strip Length mm (in.)</th>
<th>Terminal Torque Values N•m (lb•in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2198-DB08-F (2)</td>
<td></td>
<td>0.5…6 (20…10)</td>
<td>7.5 (0.30)</td>
<td>0.8 (7.1)</td>
</tr>
<tr>
<td>2198-DBR20-F 2198-DB20-F</td>
<td></td>
<td>2.5…10 (14…8)</td>
<td>9.0 (0.35)</td>
<td>2.0 (17.7)</td>
</tr>
<tr>
<td>2198-DBR40-F 2198-DB42-F</td>
<td>L1, L1’ L2, L2’ L3, L3’</td>
<td>2.5…35 (14…0)</td>
<td>18.0 (0.71)</td>
<td>4.5 (39.8)</td>
</tr>
<tr>
<td>2198-DBR90-F 2198-DB80-F</td>
<td></td>
<td>21.1…120 (4…250 kcmil)</td>
<td>27.0 (1.06)</td>
<td>12 (106)</td>
</tr>
<tr>
<td>2198-DBR200-F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2198-DB290-F</td>
<td>Bus-bar (3)</td>
<td>N/A</td>
<td>30 (266)</td>
<td></td>
</tr>
</tbody>
</table>

(1) The wire size of the input power wiring depends on the system configuration. Consult your machine builder, the NEC, and applicable local codes.
(2) Applies to installations with single-phase or three-phase input power.
(3) Apply crimp eyelet terminals to lug connections by using the supplier-recommended tooling.

## AC Line Filter Dimensions

### AC Line Filter Dimensions (catalog number 2198-DB08-F)

![Dimensions Diagram](image.png)

Dimensions are in mm (in.).

45 (1.77) 79 (3.11) 1.2 (0.05) 179 (7.05) 173 (6.81) 32 (1.26) 6.0 (0.24) 6.3 (0.25) 6.0 (0.24) 167 (6.57) R3.0 (0.12) M5 x 4
AC Line Filter Dimensions (catalog number 2198-DB20-F)

Dimensions are in mm (in.).

AC Line Filter Dimensions (catalog number 2198-DB42-F)

Dimensions are in mm (in.).
AC Line Filters

AC Line Filter Dimensions (catalog number 2198-DB80-F)

Dimensions are in mm (in.).

AC Line Filter Dimensions (catalog number 2198-DB290-F)

Dimensions are in mm (in.).

M4 threaded inserts for optional terminal covers.
AC Line Filters

AC Line Filter Dimensions (catalog number 2198-DBR20-F)

Dimensions are in mm (in.).

AC Line Filter Dimensions (catalog number 2198-DBR40-F)

Dimensions are in mm (in.).
AC Line Filters

AC Line Filter Dimensions (catalog number 2198-DBR90-F)

Dimensions are in mm (in.).

AC Line Filter Dimensions (catalog number 2198-DBR200-F)

Dimensions are in mm (in.).
## AC Line Filter Specifications

<table>
<thead>
<tr>
<th>AC Line Filter Cat. No.</th>
<th>Voltage (1) Rating, max</th>
<th>Current Rating A @ 50 °C (122 °F)</th>
<th>Power Loss @ Rated Current W</th>
<th>Leakage Current, typ mA</th>
<th>Weight, approx kg (lb)</th>
<th>Operating Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>2198-DBR20-F</td>
<td>528V AC single and three-phase 50/60 Hz</td>
<td>20</td>
<td>4.2</td>
<td>30</td>
<td>1.0 (2.20)</td>
<td>0...50 °C (32...122 °F)</td>
</tr>
<tr>
<td>2198-DBR40-F</td>
<td>40</td>
<td>9.6</td>
<td></td>
<td></td>
<td>3.3 (7.28)</td>
<td></td>
</tr>
<tr>
<td>2198-DBR90-F</td>
<td>90</td>
<td>16.8</td>
<td>34.0</td>
<td>4.1 (9.04)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2198-DBR200-F</td>
<td>200</td>
<td>34.5</td>
<td>46.0</td>
<td>7.2 (15.87)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2198-DB08-F</td>
<td>7.5</td>
<td>3.6</td>
<td>2.5</td>
<td>0.77 (1.70)</td>
<td></td>
<td>0...50 °C (32...122 °F)</td>
</tr>
<tr>
<td>2198-DB20-F</td>
<td>20</td>
<td>5.1</td>
<td>5.2</td>
<td>1.63 (3.59)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2198-DB42-F</td>
<td>42</td>
<td>14.7</td>
<td>4.0</td>
<td>2.70 (5.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2198-DB80-F</td>
<td>80</td>
<td>18.3</td>
<td>13.0</td>
<td>3.95 (8.71)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2198-DB290-F</td>
<td>290</td>
<td>32.7</td>
<td>19.4</td>
<td>4.20 (9.26)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) SCCR rating = 200 kA.

## Mounting Clearance Specifications

Minimum clearance on either side of the Bulletin 2198 AC line filters is 50 mm (1.97 in.). When line filter units are positioned side-by-side on the panel, only 50 mm (1.97 in.) is required between them.

Dimensions are in mm (in.).

Wire Connection (1) Terminals

(1) Clearance required at the terminals for NEC specified bend radius depending on the wire size in use.
Additional Resources

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

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
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<tbody>
<tr>
<td>Kinetix 5700 Servo Drives User Manual, publication 2198-UM002</td>
<td>Provides detailed information on installing, configuring, starting, troubleshooting and integration with Logix 5000 controllers.</td>
</tr>
<tr>
<td>Kinetix 5500 Servo Drives User Manual, publication 2198-UM001</td>
<td></td>
</tr>
<tr>
<td>iTRAK System User Manual, publication 2198T-UM001</td>
<td></td>
</tr>
<tr>
<td>System Design for Control of Electrical Noise Reference Manual, publication GMC-RM001</td>
<td>Information, examples, and techniques designed to minimize system failures caused by electrical noise.</td>
</tr>
<tr>
<td>Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1</td>
<td>Provides general guidelines for installing a Rockwell Automation industrial system.</td>
</tr>
<tr>
<td>Product Certifications website, rok.auto/certifications</td>
<td>Provides declarations of conformity, certificates, and other certification details.</td>
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Notes:
Rockwell Automation Support

Use the following resources to access support information.

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<tr>
<td>Direct Dial Codes</td>
<td>Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.</td>
<td><a href="http://www.rockwellautomation.com/global/support/direct-dial.page">http://www.rockwellautomation.com/global/support/direct-dial.page</a></td>
</tr>
</tbody>
</table>

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