Current-compensated Chokes

- Rated currents from 16 to 50 A
- Up to 600 VAC or 1000 VDC
- 2- and 3-wire configurations
- Horizontal and vertical PCB mounting types
- Ruggedized saturation and thermal behavior
- Open construction for forced and convection cooling
- Straightforward pin-out for easy PCB design

Performance indicators

<table>
<thead>
<tr>
<th>Inductance value (mH)</th>
<th>0</th>
<th>20</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rated current [A]</th>
<th>0</th>
<th>30</th>
<th>60</th>
<th>90</th>
<th>120</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approvals & Compliances

RoHS

RB common-mode chokes are mainly used to filter EMI noise on AC power lines up to 600 VAC but they are as well applicable in DC power lines of photovoltaic installations or similar applications up to 1000 VDC. EMI noise of electronic equipment can go to the power lines and disturb the proper function of other devices like TV sets or radios. Thus noise generated by the equipment from switched power electronics or by high slew rates of controllers needs to be filtered. RB common-mode chokes are used to suppress EMI noise in PCB integrated filter designs with line bypass capacitors or in combination with single phase filters for extra low leakage filter designs.

Features and benefits

- Cost-effective PCB designs for up to 80 A with forced cooling *
- Compact size and light weight
- Low magnetic leakage flux
- Excellent winding insulation
- Standardized footprint
- Broad range of inductance ratings
- Custom specific versions on request
- Evaluation Board and PCB footprints available

* See Application Note for forced cooling

Technical specifications

<table>
<thead>
<tr>
<th>Maximum continuous operating voltage</th>
<th>600 VAC/1000 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
<td>DC to 400 Hz</td>
</tr>
<tr>
<td>Rated currents</td>
<td>16 to 50 A @ 60°C max. convection cooling</td>
</tr>
<tr>
<td>High potential test voltage</td>
<td>2500 VAC, 60 sec guaranteed; 2 sec factory test</td>
</tr>
<tr>
<td>winding-to-winding</td>
<td>-40°C to +125°C (40/125/21) acc. IEC 60068-1</td>
</tr>
<tr>
<td>Temperature range (operation and storage)</td>
<td>UL 94 V-0</td>
</tr>
<tr>
<td>Flammability corresponding to Cooling</td>
<td>convection/forced cooling</td>
</tr>
<tr>
<td>MTBF @ 40°C/230 V (MII-HB-217F)</td>
<td>&gt;5,000,000 hours</td>
</tr>
</tbody>
</table>

Typical applications

- AC and DC filtering for midsize power range drives, photovoltaic inverters, fast chargers, charging stations, UPS and switch mode power supplies
- Filter with low leakage current noise or improved immunity against grid disturbances
- Electronic devices, automation
- Converters

Typical electrical schematic

```
L1  -----  L1'
   \   /   \
    O     O
   /   \   /
L2  -----  L2'
   \   /   \
    O     O
   /   \   /
L3  -----  L3'
```
## RB Series

### Selection table

<table>
<thead>
<tr>
<th><em>forced cooling</em></th>
<th>Inductance</th>
<th>Resistance</th>
<th><strong>Choke</strong></th>
<th>Ø Pin</th>
<th>Length Pin</th>
<th>Weight</th>
<th>Eval. Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>convection nominal current @ 60°C</td>
<td>Ln @ 25°C</td>
<td>Ls @ 25°C</td>
<td>R @ 25°C</td>
<td>[mH/path]</td>
<td>[μH/path]</td>
<td>[mΩ/path]</td>
<td>[size]</td>
</tr>
<tr>
<td>RB 6122-16-1M0</td>
<td>16</td>
<td>25</td>
<td>1.00</td>
<td>6.3</td>
<td>48</td>
<td>1</td>
<td>2.0 ±0.1</td>
</tr>
<tr>
<td>RB 6122-25-0M6</td>
<td>25</td>
<td>39</td>
<td>0.64</td>
<td>4.0</td>
<td>2.7</td>
<td>1</td>
<td>2.4 ±0.1</td>
</tr>
<tr>
<td>RB 6122-36-0M5</td>
<td>36</td>
<td>53</td>
<td>0.45</td>
<td>3.6</td>
<td>1.5</td>
<td>2</td>
<td>2.2 ±0.1</td>
</tr>
<tr>
<td>RB 6122-50-0M3</td>
<td>50</td>
<td>80</td>
<td>0.25</td>
<td>1.8</td>
<td>0.9</td>
<td>2</td>
<td>2.5 ±0.1</td>
</tr>
<tr>
<td>RB 6522-16-1M0</td>
<td>16</td>
<td>25</td>
<td>1.00</td>
<td>6.2</td>
<td>4.6</td>
<td>3</td>
<td>2.0 ±0.1</td>
</tr>
<tr>
<td>RB 6522-25-0M6</td>
<td>25</td>
<td>39</td>
<td>0.64</td>
<td>3.9</td>
<td>2.6</td>
<td>3</td>
<td>2.4 ±0.1</td>
</tr>
<tr>
<td>RB 6522-36-0M5</td>
<td>36</td>
<td>53</td>
<td>0.45</td>
<td>3.6</td>
<td>1.5</td>
<td>4</td>
<td>2.2 ±0.1</td>
</tr>
<tr>
<td>RB 6522-50-0M3</td>
<td>50</td>
<td>80</td>
<td>0.25</td>
<td>2.0</td>
<td>0.9</td>
<td>4</td>
<td>2.5 ±0.1</td>
</tr>
<tr>
<td>RB 8522-16-3M0</td>
<td>16</td>
<td>25</td>
<td>3.00</td>
<td>22.2</td>
<td>8.4</td>
<td>4</td>
<td>2.0 ±0.1</td>
</tr>
<tr>
<td>RB 8522-25-2M0</td>
<td>25</td>
<td>39</td>
<td>2.00</td>
<td>13.6</td>
<td>4.2</td>
<td>5</td>
<td>2.65 ±0.1</td>
</tr>
<tr>
<td>RB 8522-36-1M5</td>
<td>36</td>
<td>53</td>
<td>1.50</td>
<td>12.8</td>
<td>3.0</td>
<td>6</td>
<td>2.2 ±0.1</td>
</tr>
<tr>
<td>RB 8522-50-0M8</td>
<td>50</td>
<td>83</td>
<td>0.75</td>
<td>6.5</td>
<td>1.7</td>
<td>6</td>
<td>2.5 ±0.1</td>
</tr>
<tr>
<td>RB 6132-16-0M8</td>
<td>16</td>
<td>26.5</td>
<td>0.80</td>
<td>5.8</td>
<td>4.6</td>
<td>7</td>
<td>2.0 ±0.1</td>
</tr>
<tr>
<td>RB 6132-25-0M5</td>
<td>25</td>
<td>41</td>
<td>0.47</td>
<td>3.3</td>
<td>2.4</td>
<td>7</td>
<td>2.5 ±0.1</td>
</tr>
<tr>
<td>RB 6132-36-0M4</td>
<td>36</td>
<td>60</td>
<td>0.42</td>
<td>2.9</td>
<td>1.4</td>
<td>8</td>
<td>2.2 ±0.1</td>
</tr>
<tr>
<td>RB 6132-50-0M2</td>
<td>50</td>
<td>80</td>
<td>0.18</td>
<td>1.9</td>
<td>0.9</td>
<td>8</td>
<td>2.5 ±0.1</td>
</tr>
<tr>
<td>RB 6532-16-0M8</td>
<td>16</td>
<td>26.5</td>
<td>0.80</td>
<td>6.9</td>
<td>4.7</td>
<td>9</td>
<td>2.0 ±0.1</td>
</tr>
<tr>
<td>RB 6532-25-0M5</td>
<td>25</td>
<td>41</td>
<td>0.47</td>
<td>3.6</td>
<td>2.4</td>
<td>9</td>
<td>2.5 ±0.1</td>
</tr>
<tr>
<td>RB 6532-36-0M4</td>
<td>36</td>
<td>60</td>
<td>0.42</td>
<td>4.2</td>
<td>1.5</td>
<td>10</td>
<td>2.2 ±0.1</td>
</tr>
<tr>
<td>RB 6532-50-0M2</td>
<td>50</td>
<td>81</td>
<td>0.18</td>
<td>1.5</td>
<td>0.8</td>
<td>10</td>
<td>2.5 ±0.1</td>
</tr>
<tr>
<td>RB 8532-16-1M3</td>
<td>16</td>
<td>27</td>
<td>1.30</td>
<td>9.1</td>
<td>5.7</td>
<td>9</td>
<td>2.0 ±0.1</td>
</tr>
<tr>
<td>RB 8532-25-0M9</td>
<td>25</td>
<td>41</td>
<td>0.94</td>
<td>6.7</td>
<td>3.0</td>
<td>11</td>
<td>2.65 ±0.1</td>
</tr>
<tr>
<td>RB 8532-36-0M8</td>
<td>36</td>
<td>58</td>
<td>0.83</td>
<td>7.3</td>
<td>2.3</td>
<td>12</td>
<td>2.2 ±0.1</td>
</tr>
<tr>
<td>RB 8532-50-0M3</td>
<td>50</td>
<td>82</td>
<td>0.33</td>
<td>3.1</td>
<td>1.2</td>
<td>12</td>
<td>2.5 ±0.1</td>
</tr>
</tbody>
</table>

Test conditions:
- Measuring frequency: 1 Hz; 500 μA >0.16 mH <1.6 mH; 50 μA >1.6 mH <160 mH
- Inductance tolerance: ±50% - 30%
- Resistance tolerance: ±15% @ 25°C
- Electrical characteristics @ 25°C ±2°C

* typical current for forced cooling with 3 m/s. Due to the possible turbulences and degradation of the air stream within an equipment please consider thermal validation.

** Due to manufacturing processes and to cover current ampacity of chokes with high current rating, the number of parallel wires does vary between different sizes.

### Typical choke attenuation/resonance frequency characteristics

Per CISPR 17; 50 Ω/50 Ω asym

![Graph 1](image1.png)

![Graph 2](image2.png)

![Graph 3](image3.png)

![Graph 4](image4.png)
**Product selector**

<table>
<thead>
<tr>
<th>RB xxxx-xx-xmix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inductance value (e.g., 9M6 = 9.6 mH)</td>
</tr>
<tr>
<td>Nominal input current [A] (convection cooling)</td>
</tr>
<tr>
<td>Terminal type (2 for PCB pin)</td>
</tr>
<tr>
<td>2 = 2-wire choke</td>
</tr>
<tr>
<td>3 = 3-wire choke</td>
</tr>
<tr>
<td>1 = Horizontal</td>
</tr>
<tr>
<td>5 = Vertical</td>
</tr>
<tr>
<td>8 = high inductance series</td>
</tr>
<tr>
<td>6 = low inductance series</td>
</tr>
</tbody>
</table>

Schaffner standard ring-core choke series RB

**Examples:**
RB 8532-16-1M3: Vertical 3-wire high inductance choke with PCB pins, for 16 A, with 1.3 mH
RB 6122-50-OM3: Horizontal 2-wire low inductance choke with PCB pins, for 50 A, with 0.3 mH

**Mechanical data: 1-phase / DC chokes**

All dimensions in mm; 1 inch = 25.4 mm
Tolerances according: ISO 2768-m/EN 22768-m
Windings of chokes are within max. component dimensions. Windings are illustrated simplified.

**Size 1 (RB 6122)**

**Size 2 (RB 6122)**
* These choke sizes do have two parallel wires. Due to manufacturing processes and to cover current ampacity of chokes with high current rating, the number of parallel wires does vary between different sizes.
Mechanical data: 3-phase chokes

All dimensions in mm; 1 inch = 25.4 mm
Tolerances according: ISO 2768-m/EN 22768-m
Windings of chokes are within max component dimensions. Windings are illustrated simplified.
Available Supporting Material

Accessories

For all RB choke types an evaluation board is available (not including capacitors and RB chokes).

All boards feature voltage ratings according to the chokes usable on the board - up to 600VAC/1000VDC.

The capacitors used need to be selected according to application and safety level. Recommended are Y1 and X1 capacitors with a voltage rating of at least 600VAC and 1000VDC.

The pitch for Y-capacitors (between phase and PE) is 15 or 22.5 mm. With a max outer dimension of 12 x 26 mm (w x l).

The pitch for X-capacitors (between phases) is 22.5, 27.5 or 37.5 mm. With a max outer dimension of 28 x 40 mm (w x l).

For discharge reason a resistor can be fitted in parallel to the X-capacitors.

All connections to the boards are done with M6 screw terminals (recommended torque is 2.5 Nm).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RB Choke Type</td>
<td>(Range A)</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RB 6122</td>
<td>16 - 50</td>
<td>1</td>
<td>EVA-BOARD FOR RB6122 SERIES</td>
<td>813249</td>
</tr>
<tr>
<td>RB 6522</td>
<td>16 - 50</td>
<td>2</td>
<td>EVA-BOARD FOR RB6522 SERIES</td>
<td>813252</td>
</tr>
<tr>
<td>RB 8522</td>
<td>16 - 50</td>
<td>3</td>
<td>EVA-BOARD FOR RB8522 SERIES</td>
<td>813254</td>
</tr>
<tr>
<td>RB 6132</td>
<td>16 - 25</td>
<td>4</td>
<td>EVA-BOARD FOR RB6132-16/25</td>
<td>813250</td>
</tr>
<tr>
<td>RB 6132</td>
<td>36 - 50</td>
<td>5</td>
<td>EVA-BOARD FOR RB6132-36/50</td>
<td>813251</td>
</tr>
<tr>
<td>RB 6532</td>
<td>16 - 50</td>
<td>6</td>
<td>EVA-BOARD FOR RB6532 SERIES</td>
<td>813253</td>
</tr>
<tr>
<td>RB 8532</td>
<td>16 - 50</td>
<td>7</td>
<td>EVA-BOARD FOR RB8532 SERIES</td>
<td>813255</td>
</tr>
</tbody>
</table>

For further drawings and CAD data of the different boards please contact your local Schaffner subsidiary.

Application Note

EMC/EMI Filter Design with RB Common Mode-Chokes

This application note addresses experienced engineers, who are familiar with the basics of EMC, and intends to provide additional information about RB choke series and Design support for PCB integrated EMC/EMI filters.

Link to PDF
Headquarters, global innovation and development

Schaffner Group
Industrie Nord
Nordstrasse 11e
4542 Luterbach
T +41 32 681 66 26
info@schaffner.com

Sales and application centers

China
Schaffner EMC Ltd. Shanghai
T20-3 C, No 565 Chuangye Road, Pudong district
201201 Shanghai
T +86 21 3813 9500
csschina@schaffner.com
www.schaffner.com.cn

Finland
Schaffner Oy
Sauvonrinne 19 H
08500 Loiha
T +358 10 567 2855
finlandsales@schaffner.com

France
Schaffner EMC S.A.S.
16-20 Rue Louis Rameau
95875 Beaumes
T +33 1 34 34 30 60
F +33 1 39 47 02 28
francesales@schaffner.com

Germany
Schaffner Deutschland GmbH
Schoemperlenstrasse 128
76185 Karlsruhe
T +49 721 56910
F +49 721 569110
germanysales@schaffner.com

India
Schaffner India Pvt. Ltd
REGUS WORLD TRADE CENTRE
WTC, 22nd Floor Unit No 2236, Brigade
gateway Campus, 26/1, Dr. Rajkumar Road
Malkeshwaram (W)
560055 Bangalore
T +91 80 67935355
indiasales@schaffner.com

Italy
Schaffner EMC S.r.l.
Via Ticino, 30
20900 Monza (MB)
T +39 039 21 41 070
italysales@schaffner.com

Japan
Schaffner EMC K.K.
Tajju-Seimei Sangenjaya Bldg.
1-32-12, Kameuma, Setagaya-ku
154-0111 Tokyo
T +81 3 5712 3660
F +81 3 5712 3651
japansales@schaffner.com
www.schaffner.jp

Singapore
Schaffner EMC Pte Ltd.
#05-09, Kg Ubi Ind. Estate
408705 Singapore
T +65 6377 3283
F +65 6377 3281
singaporesales@schaffner.com

To find your local partner within Schaffner’s
global network: www.schaffner.com

© 2018 Schaffner Group

The content of this document has been
carefully checked and understood. However,
nor its subsidiaries assume
liability whatsoever for any errors or
inaccuracies of this document and the
consequences thereof. Published specifications
are subject to change without notice. Product suitability for any area of application
must ultimately be determined by the
customer. In all cases, products must never
be operated outside their published specifications. Schaffner does not guarantee
the availability of all published products. This
disclaimer shall be governed by substantive
Swiss law and resulting disputes shall be
settled by the courts at the place of business
of Schaffner Holding AG. Latest publications
and a complete disclaimer can be downloa-
ded from the Schaffner website. All
trademarks recognized.