

## Evaluation (EVA) Board for RB chokes

### Scope of EVA boards

These series of printed circuit boards (PCB) are designed to build up, verify and test EMC/EMI filter with RB chokes and discrete X-capacitors (Cx) and Y-capacitors (Cy), before integrating the filter to the application. For the option to discharge the capacitors after disconnection from the line bleed resistors (R) are also foreseen. The boards are designed to run and modify them as a prototype filter units under test conditions in areas with restricted access for people who are authorized and educated to work in test environment with touchable high voltage. The boards can handle currents up to 50A (80A with forced cooling 3m/s) at room temperature.

### **This manual covers the following evaluation boards:**

EVA-RB6122-50 for RB6122 16 to 50A

EVA-RB6522-50 for RB6522 16 to 50A

EVA-RB8522-50 for RB8522 16 to 50A

EVA-RB6132-25 for RB6132 16 to 25A

EVA-RB6132-50 for RB6132 36 to 50A

EVA-RB6532-50 for RB6532 16 to 50A

EVA-RB8532-50 for RB8532 16 to 50A

### Safety instructions

The terminals and the surface of the board are not protected against accidental touch.

The operator of the test environment has to make sure that:

- All components are proper soldered to the PCB and terminals are reliable connected to the supply line. Filter board, cables and connection must carry high currents. Bad connections lead to exceeding power dissipation and can cause fire.
- Only authorized employees who are familiar with power electronic work around the high voltage equipment.
- Entrances of the area are labeled with a High Voltage sign.

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- Terminals, insulation to ground and cable insulation can withstand surges caused by burst and surge tests, electrical faults or switching transients, the test setup is protected with overcurrent measures (fuses, RCDs) and operating personal is protected against the impact of failure of components.
- Everything is discharged before doing modifications. After the input power is off, capacitors, parallel power units or the application can still store energy and keep voltage on a dangerous level to touch.
- Test setup is protected against accidental power-on, when working with power lines that serve more than one area.
- Before working in a high voltage area, inspection of the power supply, the filter board and all protective devices has been done.
- People are not working alone near high voltage.
- Equipment and input power sources are labeled to identify and control line side sources and load side.
- The test area is equipped with an emergency shutdown.

### Design of EMC/EMI filters

Use the low inductance series (RB6xxx) for currents with high crest factors (e.g. rectifier bridges without power factor correction). For applications with power factor correction the high inductance series (RB8xxx) and the low inductance series (RB6xxx) can be used.

For more details about RB choke refer to the [RB series datasheet](#).

Select the Y-caps with respect to the line voltage and the required Hi-Pot test voltage (line against ground). Design the capacitance size according the allowed leakage current. For details to calculate the leakage current refer to Schaffner Application Note "[Leakage current in power line filters](#)". The proper function of the Y-cap filtering depends strongly on the short way for the common mode current back to the noise source.

Select the X-caps with respect to the line voltage and the required Hi-Pot test voltage (line against line) and design the capacitance according the differential mode noise and the EMC limits. The line-side X-cap(s) build a 2<sup>nd</sup> order filter with the stray inductivity of the RB chokes (about 1% of the nominal L).

Select bleed resistors with respect to the line voltage, power dissipation and discharge time.

For more information consult our web page or your local partner: [www.schaffner.com](http://www.schaffner.com)