



# Schaffner - A Visual Guide to EMI Filters

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*Please see last page for Schaffner USA Contact Information*

# SCHAFFNER - A VISUAL GUIDE TO EMI FILTERS

## INTRODUCTION

EMI filters are products that help to reduce electro-magnetics interference generated from modern electrical and Electronic equipment, allowing systems to operate with higher reliability and meet the latest compliance regulations.

This visual guide uses several common applications to demonstrate where Schaffner filters are typically used and provide product recommendations.

These applications include:

- Consumer Electronics
- Industrial Electronics, Automation Systems, and Robotics Control
- Industrial Lighting
- Medical Equipment
- Renewable Energy Systems (Solar/Wind)
- Test and Measurement Equipment

For more information about a specific filter application, you can click on the filter product number to be directed to Schaffner's product description web page. Here you will find a wealth of information, including datasheets, about Schaffner's EMI filters and other EMI mitigation solutions.

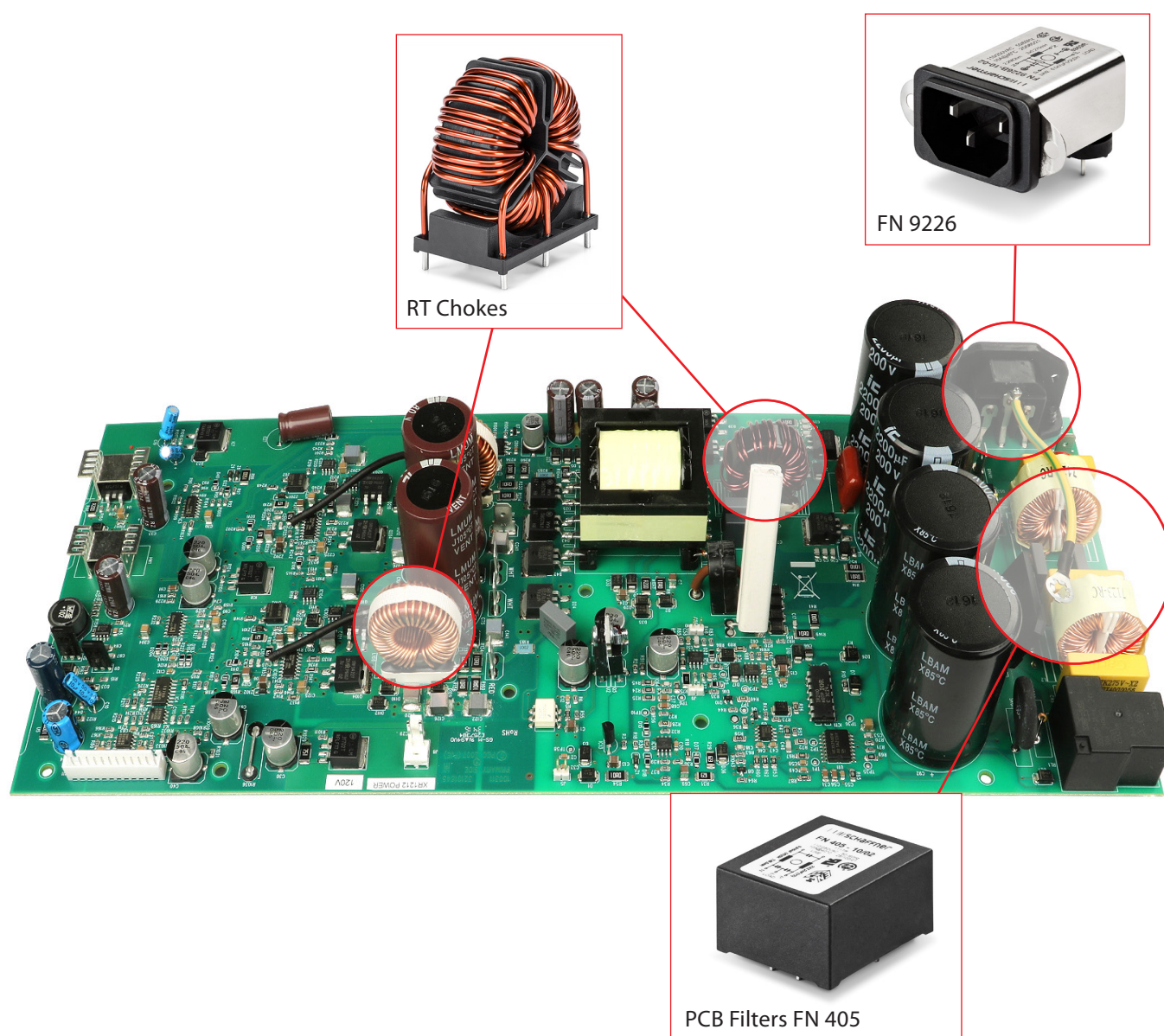




# CONSUMER ELECTRONICS

Schaffner offers suppression filters that are highly versatile. Though intended and specified for suppression of conducted emissions, they may be utilized for mitigating radiated emissions and enhancing EMI immunity. They are valuable in the design phase of product development, and can be incorporated into a device at the board level, assembly level, or even as an aftermarket retrofit. Lastly, EMI filters may even be customized by a manufacturer to serve the unique needs of a wide range of applications, and are often the last hope for product designers struggling to meet EMC testing requirements and reduce the noise from interfering equipment.

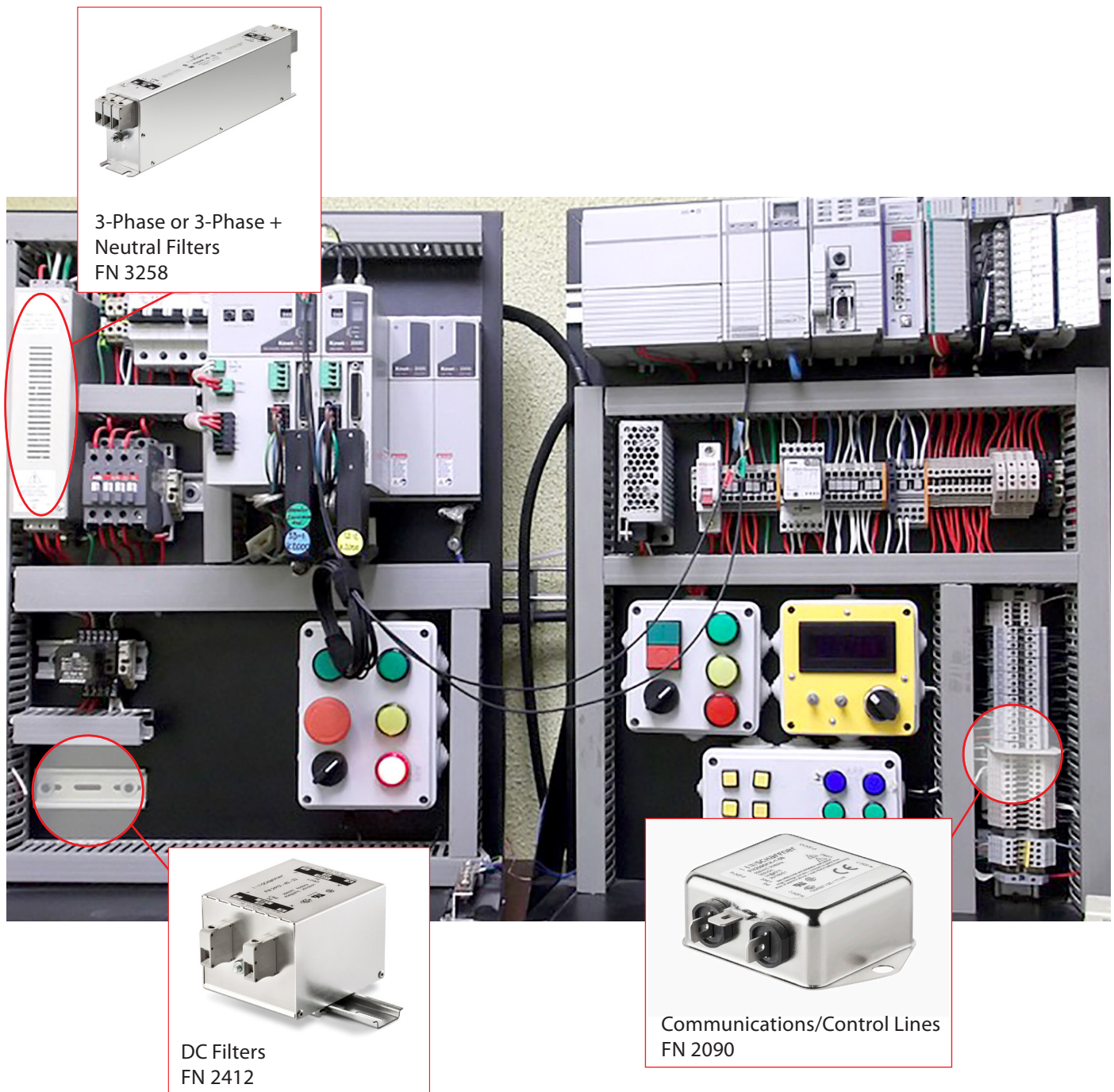
The following example demonstrates where Schaffner's EMI filters can be incorporated on the PCB board of consumer electronics.



# FACTORY AUTOMATION

With a larger margin allowed by EMC standards for industrial equipment and factory automation systems, the noise and interference in factories and work sites can be overwhelming to the increasingly computerized and digital industrial devices. Schaffner's EMI filters can be both a proactive tool for preventing damage and interference to sensitive equipment, and handy for on site retrofits that can resolve troublesome failures. There are many EMI filter types that can be rapidly customized to unique needs, as the mix of factory automation electronics becomes more diverse and complex.

This example presents several of Schaffner's EMI filter solutions designed to solve the challenges of high voltage and high current industrial electronics.



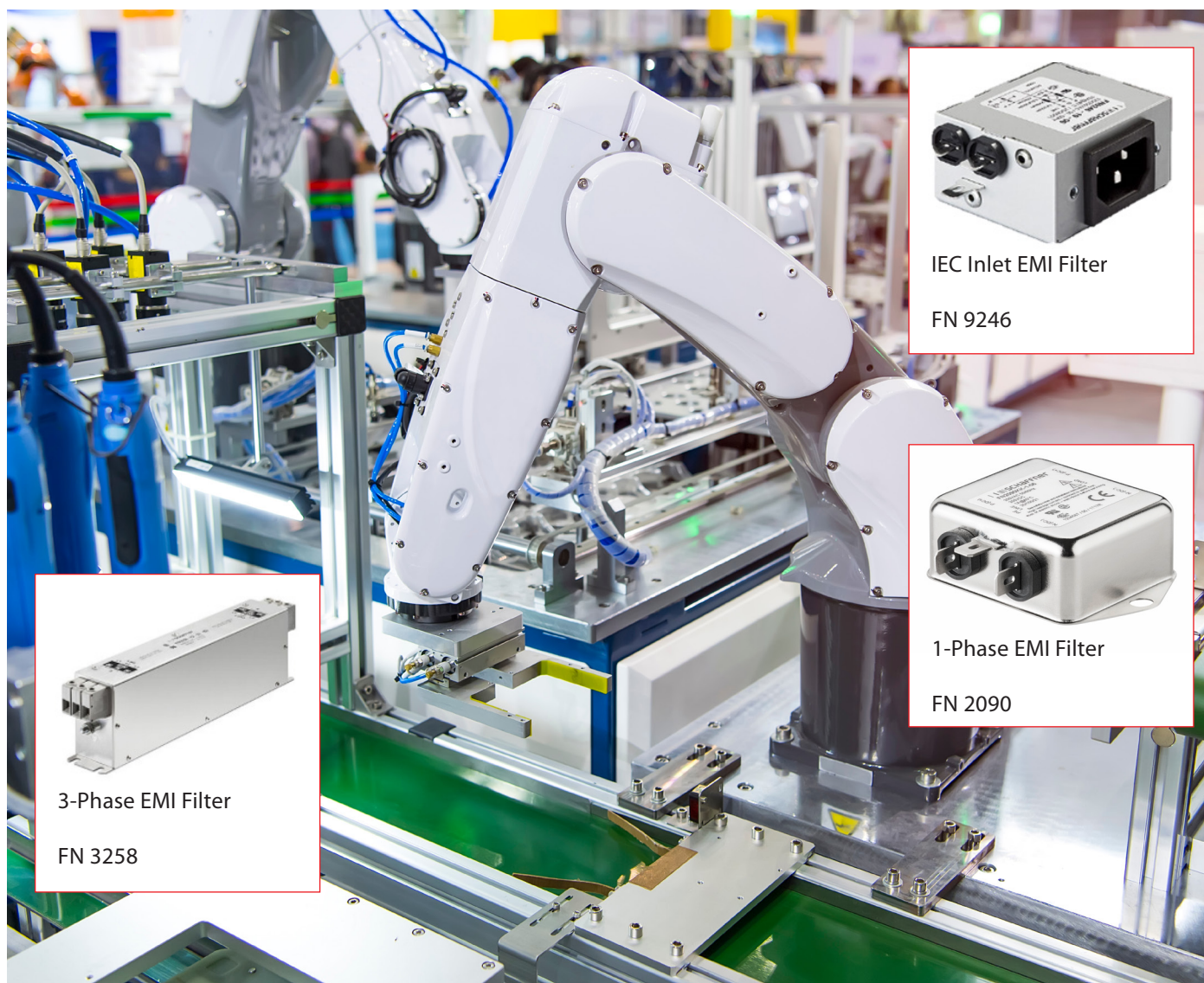


## INDUSTRIAL CONTROLS/ROBOTICS

With increasing frequency, EMI filters are being used in various types of robotics across industries. Robotic machines are usually controlled electronically and must perform reliably even under harsh conditions. They contain sensitive electronics that must be protected from network faults, which could hinder the quality and performance of the machine.

Schaffner's EMI filters, chokes and feedthrough components reduce high-frequency interferences originating from the electronic drive units of robotics, allowing for an uninterrupted production system uptime.

See examples below of how Schaffner's EMI filters can enable robotic systems to perform reliably.



# INDUSTRIAL LIGHTING

Lighting is needed in virtually all homes and industrial facilities worldwide. The voltage levels and power conversion electronics that enable new and efficient lighting technologies also bring about new sources of EMI. Schaffner EMI filters either designed into a lighting system, or added as a retrofit when problems occur, can be one of the quickest and most cost effective ways of achieving greater customer satisfaction with industrial lighting installations. EMI filters incorporated into new switching power supplies for LED bulbs and accent lighting, can be a way of avoiding complex design and troubleshooting considerations needed to pass increasingly stringent EMC testing.

This example shows areas where Schaffner EMI filters that can solve many common EMI and compliance issues with lighting systems.





# MEDICAL ELECTRONICS

## Medical Equipment

EMC challenges impact the overall device design, usability, and patient experience of medical equipment, it is important that EMI filters provide optimal performance, while minimizing impact on the overall dimensions, handling, and experience of the device. Hence, when selecting filters for EMI mitigation of medical devices, the size, weight, and position of the device all come into play. Ultra-compact Schaffner EMI filters, which are also reliable, may be essential in guaranteeing quality and ease of performance, along with the level of reliability that patients demand.

When it comes to medical electrical equipment, the reliability of operation is of great importance. EMI filters can improve the immunity of medical equipment as well enabling them to operate as intended in the presence of EMI from equipment operating nearby. The example describes several instances where Schaffner EMI filters can be employed with medical equipment.





# RENEWABLE ENERGY SYSTEMS

In remote locations, mobile applications, or in large renewable energy generation operations, it is often a substantial cost to bring out technicians with the knowledge and capability of diagnosing and troubleshooting EMI issues. Also, the damage from interference could go unnoticed until a major failure occurs, as many of these systems are only remotely monitored. The computerization with modern renewable energy systems also leads to more sensitive systems than prior technologies, and additional EMI mitigation design features could be advantageous to consider early on in the planning process or as last-minute fixes to ensure reliable and efficient operation. Schaffner EMI filters can be used in many renewable energy systems as a cost effective and compact method of reducing emissions without impacting time-to-market and product margins.

The example provides suggestions of how Schaffner EMI filters can be used in a renewable energy system.



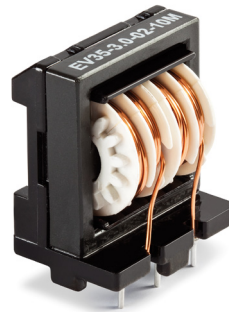
# TEST EQUIPMENT

Schaffner EMI filters are highly versatile solutions that can be provided as low-cost last minute add-ons aiding test and measurement equipment with enhanced competitive performance and immunity. The flexibility of ordering customized EMI filters also opens many doors for solving unique, and particularly troublesome, EMI issues for test equipment operating in congested industrial environments.

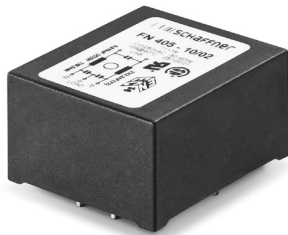
The example provides Schaffner EMI filter recommendations often used with test and measurement equipment.



IEC Inlet Filters  
FN 9222



Chokes  
EV/EH Series



PCB Filters  
FN 405



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