

## EMI-RFI Filters

### Applications

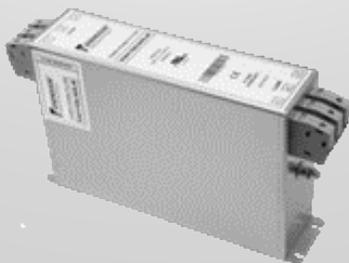
- Automotive
- Medical
- Semiconductor
- Oil & Gas
- Food & Beverage
- Retail Warehouses

### Benefits

- Ensure uninterrupted operation and intended output
- Prevent machine malfunctions, faulty outputs and production loss
- Ensure electrical equipment complies with CE Standards
- Reduce EMC interference and prevents PLCs, sensors and PCs from failing

### Features

- 5-Year warranty
- Excellent attenuation
- Low leakage current
- Cost effective



## EMI/RFI Filters Designed for Material Handling Equipment: Carrying CE and UL Approvals

Material handling equipment is used in various markets including industrial, automotive, medical, semiconductor, oil & gas, food & beverage, and retail warehouses. As industrial automation and material handling equipment become more computerized, the vulnerability of equipment to electromagnetic interference (EMI) increases. Filtering and shielding devices against EMI are crucial to ensure uninterrupted operation and intended output.

Within industrial settings machines operate close to each other making them vulnerable to interference and reliant on EMC filters to prevent RF noise interruptions. This is especially important as interference may cause controls to malfunction, causing faulty outputs, accidents, or production loss due to machine failure.

As one of the largest EMC filter manufacturers in the world, Enerdoor provides state-of-the-art EMC filters and power quality devices designed for material handling equipment for every industry and application.

### **Common Industrial Sources of EMI/RFI**

Industrial environments are full of potential sources of interference due to electronic device connections that may cause electromagnetic or radio frequency interference (RFI). Common industrial sources of EMI include:

**Servo and Variable Frequency Drives (VFDs):** This is the most common source of RF noise in the industrial automation environment. These drives switch frequencies typically between 2 kHz and 20 kHz, to generate a pulse for regulating motors that can spread through the entire system including even the ground. The RF noise is common (phases and ground) and differential (phase to phase) and is considered high frequency noise in the 9 kHz – 50 MHz frequency range.

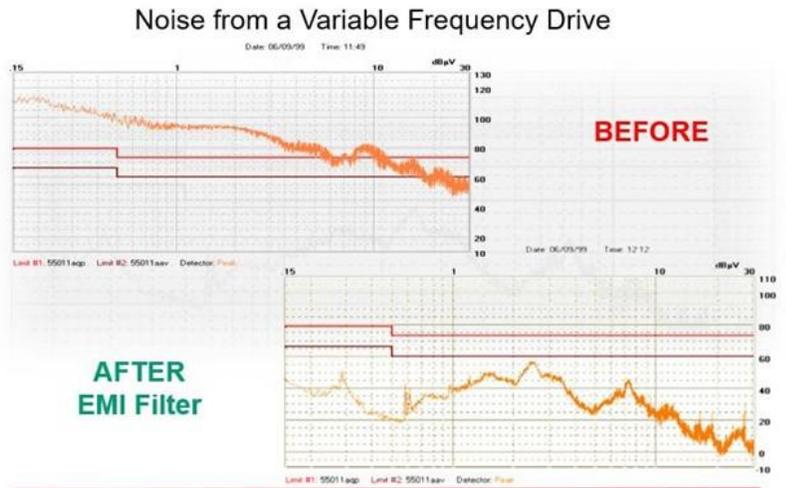
**Harmonics:** Non-linear load devices that do AC–DC, such as power supplies, servo-drives and VFDs can cause high-frequency harmonics of the fundamental AC frequency.

These harmonics can cause AC waveform distortion which may cause power electronics and machines to malfunction. The odd harmonics are out of phase from the fundamental frequency causing the majority of equipment malfunctions. Harmonics are considered very low-frequency noise in the frequency range of 150 Hz – 3 kHz.

### Benefits of EMI/RFI Filters:

EMI/RFI filters solve problems associated with electromagnetic noise associated with high frequency switching inside VFDs. The filters suppress interference generated by a device, or by other equipment, and protect devices from electromagnetic interference signals present in the environment. Benefits of EMI/RFI filters include:

- Ensures electrical equipment complies with CE and EMC Standards
- Reduces EMC interference and prevents PLCs, sensors and PCs from failing
- Increases product life of sensitive components and prevents production downtime



**Industries:** Material handling equipment, OEMs, automated machinery, any equipment using servo drives, VFDs, and AC-DC switching components.

### EMI/RFI Filter Buying Guide – 5 Top Tips

**Compliance:** Is the filter required for compliance to a CE Directive or Standard? This may determine which filter is needed. If an EMI filter is required with no particular Standard in mind, this can also change the selection.

**Certifications:** Is UL, CE, or CSA certification required? Be sure the filter meets the certification requirements.

**Sizing:** The filter should be properly rated for the voltage and FLA of the equipment.

**Performance:** Determine the level of attenuation required to ensure the equipment will work properly. Do any measurements or data need to be considered? Product designers should also consider if there are multiple VFDs or particularly sensitive components that will require a higher performance filter.

**Installation:** Ensure proper installation for achieving the best results from an EMI filter. This may require setting aside room in the control cabinet. Typically, best practice is to install the filter as close to the mains disconnect as possible, upstream of all sensitive components on the branch.