

# EMI SHIELDING SOLUTIONS FOR MEDICAL VENTILATOR APPLICATION

## OVERVIEW

Interruption in medical device performance such as ventilator can be the difference between life and death. Without proper EMI shielding, medical devices, including life-support systems and essential monitoring equipment are vulnerable to signal noise, damage, or total functional impairment. A ventilator that doesn't meet prescribed emission limits can lead to various unfavorable consequences for other medical devices:

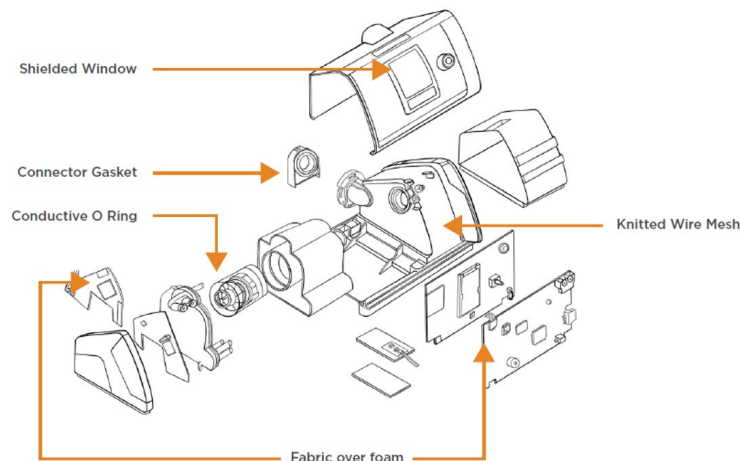
**Potential Equipment Shutdown:** In the worst-case scenario, the non-compliant ventilator might unexpectedly shut down, a critical issue when it's supposed to operate continuously, 24/7.

**Intermittent Failures:** Such non-compliance can result in intermittent failures, disrupting normal device operation. Identifying and troubleshooting the source of electromagnetic interference (EMI) disturbances can be time-consuming and challenging. These intermittent failures could lead to the malfunction of essential features like alarms, lights, motors, displays, and LED indicators during crucial moments.

**Metastable Logic:** Another consequence could be the occurrence of metastable logic, typically caused by a logic gate getting stuck between states 0 and 1. This can trigger a firmware error, necessitating a manual restart of the machine.

## TE CONNECTIVITY ADVANTAGES

- Customization Capability
- Engineering Expertise
- Industry Experience
- Manufacturing Scale
- Portfolio Breadth



| Shielding type                    | Application      | Features  | Benefits  |
|-----------------------------------|------------------|---|---|
| <a href="#">Connector Gasket</a>  | Air Filter Cover | <ul style="list-style-type: none"> <li>Offering a wide range of standard MIL connector gaskets. Different materials are available to meet the demands of EMI shielding, environmental sealing, galvanic compatibility and fuel / oil resistance.</li> </ul>   | <ul style="list-style-type: none"> <li>The compression stop also ensures additional electrical bonding between the surfaces with a very low contact resistance.</li> <li>Surface mounted gaskets are to be used where groove mounted gaskets such as O-Rings cannot be accommodated.</li> </ul>             |
| Shielded Window                   | LCD Display      | <ul style="list-style-type: none"> <li>Termination of the EMI Shield windows to the enclosures is achieved with a continuous low resistance conductive edge around the window</li> </ul>  | <ul style="list-style-type: none"> <li>Providing optimum transparency and EMI shielding.</li> </ul>   |
| <a href="#">Fabric over foam</a>  | PCB              | <ul style="list-style-type: none"> <li>Soft and conformable</li> </ul>  | <ul style="list-style-type: none"> <li>Grounding</li> </ul>   |
| <a href="#">Knitted Wire Mesh</a> | Enclosure        | <ul style="list-style-type: none"> <li>The mono-filament interlocking loop construction gives strength while allowing it to conform to almost any size or shape.</li> <li>A selection of elastomer cores are available to meet conditions such as temperature range, compression set, compression force.</li> </ul> | <ul style="list-style-type: none"> <li>Delivers good galvanic match with mating flanges, thereby limiting the possibility of corrosion between gasket and flange.</li> <li>Excellent radio frequency interference (RFI)/electromagnetic interference (EMI) shield between two metallic surfaces.</li> </ul> |
| <a href="#">Conductive o ring</a> | Fan              | <ul style="list-style-type: none"> <li>Conductive elastomers can provide great EMI shielding performance at a relatively low cost</li> <li>Range of different materials and profiles available to suit the application including a UL94-VO material</li> </ul>  | <ul style="list-style-type: none"> <li>Material options to provide required</li> <li>EMI performance and galvanic compatibility</li> <li>Provide low contact resistance between connector and enclosure</li> </ul>  |

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