Comparison of IEC/EN 60335 and IEC/EN 61558 for Power Supply Applications

In this article, we explore the concept of safety compliance between IEC/EN 60335 and IEC/EN 61558 standards, highlighting their complementary roles in appliance and power supply design. Both ensure user protection and reliable operation. Delta's offerings, including various form factors such as enclosed/panel mount, open frame, and DIN rail models, meet both standards, supporting seamless integration across consumer and household applications.

Introduction

Safety standards like IEC/EN 60335 and IEC/EN 61558 are crucial for power supply design in consumer and industrial contexts. IEC/EN 60335 focuses on household appliance safety, while IEC/EN 61558 addresses the safety of transformers and power supplies. Both impose strict criteria (insulation strength, creepage, leakage limits) to prevent electric shock and fire hazards.

Why It's Required

Mains-connected power supplies present inherent risks that must be controlled. These standards exist to protect users by limiting hazards like electric shock, overheating, and fire. For example, they cap leakage current so that if a grounding fault occurs, a person touching the appliance will not receive a dangerous shock. They also require robust insulation and construction testing, ensuring faults do not lead to injury or property damage. Compliance is often legally mandated (e.g. the EU Low Voltage Directive) and demonstrates adherence to accepted safety principles. Adopting IEC/EN 60335 or IEC/EN 61558 early in design not only safeguards end-users but also streamlines product certification, saving time and cost in bringing power supply products to market.

Application Domains

IEC/EN 60335-1 ("Safety of Household and Similar Electrical Appliances") applies to consumer devices up to 250 V_{AC} single-phase, such as kitchen, cleaning, and personal care appliances. Since users are often untrained and may touch the equipment, the standard limits leakage current (< 0.75 mA) and mandates fire-resistant materials verified by glow-wire tests. Many household devices lack an earth connection (Class II), so double insulation and strict creepage distances are required to prevent electric shock under single-fault conditions.

IEC/EN 61558 ("Safety of Power Transformers, Reactors, Power Supplies, and Similar Products") covers power conversion components used in various sectors. It includes general rules (-1) and specific parts, such as IEC/EN 61558-2-16 for switch-mode power supplies. This standard ensures safe isolation (withstand voltages > 4 kVac for reinforced insulation) and protection against overheating or short circuits. It applies to transformers and AC-DC modules in controls, chargers, and LED drivers. Together, IEC/EN 60335 ensures overall appliance safety, while IEC/EN 61558 safeguards the internal power supply hardware.

Delta’s Solution

Delta’s power supplies integrate both IEC/EN 60335 and IEC/EN 61558 standards, ensuring safety for consumer and industrial applications. The company offers multiple form factors, including enclosed, open frame, and DIN rail models.

From the enclosed type, the **MEB Series** (750–2500 W) and **PMR Series** (150–1500 W) provide outputs from 12 V to 48 V—ideal for smart home appliances or industrial equipment requiring certified safety compliance.

In open frame designs, the **PJH** and **MEP Series** suit lower-power household devices such as coffee makers and washing machines.

For DIN rail applications, the **Chrome II Series** covers 15–100 W models with 5–48 V outputs, supporting building automation and control systems.

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