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What does a BF rating on a power supply mean?

TDK-Lambda recently launched the [EFE-M series](#), a medically BF rated power supply. It immediately sparked the question from my colleagues – “What is a BF rating?” To answer this question we need to start with the term “Applied Part.”

IEC 60601-1 is the international medical electric safety standard that uses the term “Applied Part” to refer to a part of a medical device which may come in physical contact with the patient during its normal operation.

Applied Parts fall into three classifications according to the nature of the medical device and the type of contact. Each classification must have a different protection level against electrical shock.

Type CF (“Cardiac Floating”) is the most stringent classification, and is used for applied parts that may come in direct contact with the heart, such as dialysis machines.



Type BF (“Body Floating”) is less stringent than Type CF, and is generally used for applied parts that have conductive contact with the patient, or having medium or long term contact with the patient. Examples of this type of equipment are blood pressure monitors, incubators and ultrasound equipment.



Type B (“Body”) is the least stringent classification, and is used for applied parts that are normally not conductive and can be immediately released from the patient. Examples of that would be LED operating lighting, medical lasers, MRI body scanners, hospital beds and phototherapy equipment.



Type B applied parts may be connected to earth ground, but Type BF & CF are separated from earth – hence the term “floating”.

Power supply Isolation Voltages vary according to the type rating.

Type	Input to Output Isolation	Input to Ground Isolation	Output to Ground Isolation

B rated	4000VAC	1500VAC	500VAC
BF/CF rated	4000VAC	1500VAC	1500VAC

Please note: power supplies are not medical devices or applied parts, and the outputs of power supplies should never be connected directly to a patient.

Many medical devices contain medical-rated power supplies. However, only the part of these "medical devices" that may come in contact with a patient during normal operation is classified as an "Applied Part."

Posted by [Power Guy](#)