

Why DC Lighting?

General

MRI is a sophisticated imaging modality that provides high resolution images of the body without the use of ionizing radiation. When a patient is placed in an MRI scanner, a powerful magnetic field causes all the protons in the body to align in the same direction. Radio Frequency (RF) pulses are then emitted, which cause the protons to deflect by varying degrees. This process results in the altered emission of an RF

signal which is picked up by a receiver and converted into a digital internal image of the body. This RF signal must be protected from interference caused by other RF sources. Sources of RF interference include radio and television signals, electronic PFC fluorescent ballasts, dimmed lighting fixtures fed with AC power, computers, and other medical imaging or treatment equipment.

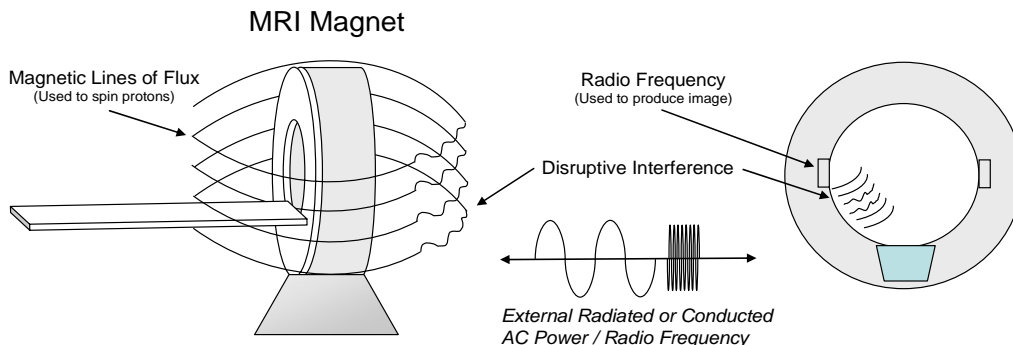
MRI suites are built in RF shielded rooms, which protect the MRI from outside RF interference. Within the MRI suite itself, AC powered dimmed lighting fixtures or electronic PFC ballasts could represent a significant source of RF interference and are not recommended. Non-ferrous lighting fixtures, powered by a DC voltage source, create the optimum conditions for distortion-free image results.

Why Not AC Voltage?

The utility power companies and standby power sources produce AC voltage, resulting in AC currents (alternating current). AC power can be described as a low frequency radio transmission at 60 cycles per second. This and higher frequencies (RF) in the

vicinity of the MRI may interfere with and distort the digital image produced; therefore, a DC voltage source, resulting in DC currents (direct current) should be used. Since DC power does not alternate, RF interference is not produced.

MRI suites are illuminated by mostly incandescent light bulbs powered by DC. Since DC is not always a readily available power source, an AC to DC power supply must be used.



Variable DC Power Supplies

Satisfying the DC power requirements for MRI suite lighting dictates that a variable DC power source be installed. There are 3 requirements:

First, the AC power source, typically 120 VAC single phase power, must be converted to highly filtered DC power.

Secondly, the DC must be user-adjustable from 0 to 120 VDC. Even under extreme light load conditions, the DC output voltage should not exceed 123 VDC. This voltage limit will increase bulb life and assure the maximum rated lumen output.

Last but not least, a 100% solid-state designed power supply should be selected, providing closed-loop DC voltage regulation. This will insure that the desired room brightness, set by medical personnel, is maintained. In addition, the best DC power supply design will be convection cooled for maximum reliability.

The Controlled Power Company Solution

Controlled Power Company manufactures the *SuiteLITE* Model SCLU, which satisfies all of the requirements described above, and more.

The *SuiteLITE* converts 120 VAC power into regulated and adjustable 120 VDC power for use with MRI suite lighting fixtures. It features +/- 2% closed loop voltage regulation to insure that the desired room brightness is maintained, regardless of

load level or input voltage variations within +/- 5% from nominal.

The *SuiteLITE* also features two unique types of dimming control: one that can be adjusted from outside the suite, or optionally, one that be adjusted from inside the suite. Either control features an on/off power switch. The *SuiteLITE* is a 100% solid-state design, is circuit breaker protected, and is provided in a convection

cooled, one-piece NEMA 1 wall-mounted enclosure. These combined features make the *SuiteLITE* the best choice for providing adjustable and controlled DC power for MRI suite lighting. The *SuiteLITE* is available in sizes ranging from 600 watts to 3000 watts.