Application

Magnetic resonance imaging (MRI) is primarily a medical imaging technique most commonly used in radiology to visualize detailed internal structure and limited function of the body.

MRI provides much greater contrast between the different soft tissues of the body useful in neurological (brain), musculoskeletal, cardiovascular, and oncological (cancer) imaging.

An MRI scanner uses a strong magnet and radio-frequency waves to generate an image. MRI magnets generates 30,000 to 60,000 times greater than earth's magnetic field.

In MRI scanners the magnetic field is generated by passing electricity through the magnetic coils of wire. These magnetic coils are cooled by Helium (Cryogenic gas).

The problem

In MRI rooms there is always the possibility of cold helium gas spreading throughout the patient area. Because Helium Gas is lighter than air, it will fill the room downwards from up there by creating oxygen deficient atmosphere.

Helium is odourless, non-toxic, non-flammable gas but may cause the risk of asphyxiation.

For this reason it is always recommended to install an Oxygen Monitoring and Alarm System which can warn in case the oxygen falls below the safe level.

The oxygen in air is normally 21% Vol and at below 19% Vol O2 the ability of humans to respond may get limited.

Leaks in the MRI magnet helium vessel and/or refrigerant system can reduce overall system efficiency, increase operating costs, and if left unattended to, introduce safety risks. In order to avoid potential problems related to helium leakage, it is important to perform a thorough leak test of the MRI magnet system on a scheduled basis. It is also important to perform the same tests during maintenance shutdown periods prior to running up the system or when the pressure in the system drops to an undesirable level.
The Solution:

During sizing / selection of Oxygen Alarm System, one should look at features like:

- GEL Type electrolyte sensing cell where no more one has to replace the electrolyte every 3 – 6 months. These types of Oxygen cells have gold contacts with expected life of 1-2 years
- Plug- in sensor cell for easy service and replacement: Once the cell life expires it can be replaced by the user themselves by plugging in a new O2 cell
- Plug-in PCB for easy service and replacement
- The Oxygen Sensor/Transmitter should have multi output 0-10V, 2-10V, 0-20mA, 4-20 mA so that can be interfaced to industry standard PLC, SCADA, BMS or gas controller to generate audio-visual alarm as warning
- Modular Gas Controller MGC-03 to have the capability to be interfaced with 1 – 2 remote oxygen depletion sensor/transmitter
- The MGC gas controller to have display, key pad for settings
- MGC gas controller should have Lo-Alarm LED and Hi-Alarm LED
- MGC Gas Controller should also have built in alarm buzzer
- MGC Gas Controller should have 2 x Relays (adjustable) to trigger external warning system (siren, flasher) or ventilation fans to normalise the oxygen concentration at 21% Vol
- The system should come with auto-diagnostic watchdog which should generate error codes signifying the type of fault with fault LED
- In addition it should have 1 x analogue output for PLC, BMS
- The oxygen Sensor/Transmitter needs to be installed on the ceiling heights as helium is lighter than air (should be accessible for service) inside the risk room
- The Gas Controller MGC-03 should be installed outside the risk room, near the entry door, so that one can monitor the situation from outside without entering the risk room
- The Warning Alarm needs to be installed outside to prevent people not to enter in case of oxygen depletion and also inside the risk room so that people from inside can come out safely in case of alarm

Finally, it is always recommended to connect the oxygen alarm system to a ventilation fan so that the oxygen depletion atmosphere can be dissipated.

INFINITE VALUE are more than happy to discuss your particular requirement for detection and will be able to propose the best system for your needs. This service is provided free of charge and without any obligation, so please call us today!!

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