

Low Voltage Can Kill

All too often, mechanical and boiler room operators have a tendency to regard electricity as dangerous only if it's high voltage -- anything over 115/120 volts.

The fact is that this perception is absolutely wrong, and people should respect this source of energy regardless of the voltage (power) involved. Here's why.

A typical body has approximately 500,000 to 2,000,000 Ohms of resistance (insulation) from the outer and inner layers of our skin, known as the epidermis and dermis layers. This is considerable protection against low voltage shocks, but the skin protection can be compromised, especially with cuts or cracks in the finger tissue. Cuts allow for an easy path to the blood stream, which is an excellent conductor for electrical current (measured in Amps) because the blood is an electrolyte. All that is needed is the proper path for current to flow across the heart and through the body while standing on a conductive surface such as a damp concrete or steel floor.

As noted above, current is measured in Amperes (Amps), and it is a known fact that only 100-200 milliamps can send a heart into fibrillation. This is a condition which causes the heart to misfire, beating irregularly and very ineffectively. Either a defibrillator is applied on the person within minutes to bring the heart back to regular rhythm or they die.

So how much voltage needs to be applied to cause fibrillation if we have a condition where the body's resistance has been reduced to 300 Ohms because the skin has been compromised?

For this answer, we go to Ohms Law, $E = IR$.

In this equation $E =$ Voltage, $I =$ Current (Amps) and $R =$ Resistance (Ohms). Applying the formula we find that 100 Milliamps is equivalent to $0.1 \text{ Amps} \times 300 \text{ Ohms} = 30 \text{ Volts}$. This is less than a standard ¼" drill!

So voltage is NOT the issue, it's current and resistance which causes the problem. In the final analysis, when it comes to electricity:

- Plan every job
- Think about what could go wrong
- Use the right tools
- Remove all jewelry

And then ask the question; "Am I really qualified?"

Your life may depend on it.



Low voltage electricity is just as volatile as high voltage electricity. Understanding current and resistance are the factors to consider.

