

Experimental Physics

Safety

- Electrical Safety
 - The effects of shock on the body are dependent on the amount of current drawn and not on the voltage, however, enough voltage will cause enough current to flow through your body.
 - Your heart and brain are the most sensitive to shock
 - In ordinary lab situations, most of the resistance is in contact through the skin and this resistance goes down when the skin is moist.
 - At low frequencies (below a few kHz) the main effects are shocks
 - sensitivity threshold is around 1 microamp
 - pain occurs around 5 microamps
 - 10-20 microamps sustained muscular contraction occurs; including contraction of the chest muscles which could cause you to stop breathing
 - 70-300 microamps: current passing through the chest may provoke fibrillation in the heart. Fatal
 - IT IS POSSIBLE TO GET A DANGEROUS SHOCK WITH VOLTAGE AS LOW AS 50V!!!
 - Radiofrequency (RF) currents do not induce shocks, but may produce burns

Precautions:

- All exposed conducting parts of instruments should be properly grounded.
- All wires, contacts having more than 25 V to ground and capable of delivering more than a few microamps of current must be protected against accidental contact
- DO NOT work on powered circuits unless you are absolutely sure that no voltages above 25V can be present.
- When working on circuits make sure that all capacitors are grounded. Some capacitors have the ability to reverse polarity and recharge themselves. For high voltage capacitors, it is best to ground their terminal after discharging them.
- **WHEN IN DOUBT, STOP WORK AND ASK ME FOR HELP. I HAVE SEEN LAB ACCIDENTS IN OTHER'S LABS AND DON'T WANT IT TO HAPPEN TO YOU.**