ComfortCalc

Manual-J Heat Loss Calculations, Hydronic Seminars

Exercise 1 - DC Volts

Gather two batteries, if available. Use a C, D, AA, or AAA cell and another battery with a different voltage, such as a 9-volt battery. Any DC circuit will read similarly to these batteries. If the meter leads are reversed, the reading will appear as a negative number.

Set the meter to read DCV at a scale greater than the battery voltage. Some meters have battery settings; I would prefer you not to use them for this exercise.

A. Test from one end to the other. Battery one, what is reading? _____

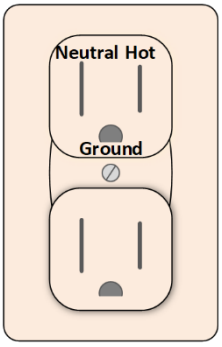
B. Reverse probes, what is the meter reading? _____.

C. Read the 9V battery if you have one, but this time figure out which terminal is positive (+) and negative (-) before testing. Was your reading proper without the minus sign?

_____

Exercise 2 - AC volts

Select a wall outlet and set the voltage to a value above the suspected outlet voltage. Most modern receptacles have three holes: hot (a shorter vertical slot), neutral (a longer vertical slot), and ground (a separate opening). To protect yourself and your meter, remember plug the black lead in first to the neutral slot.



A. Stick the probes into the two vertical openings. What is the meter reading? _____

B. Reverse the leads. Did the reading change? _____

C. Check for proper polarity. Measure volts between the short opening and ground. What should the reading be? _____

D. If the reading is correct, it is good. If the reading is very different, what does that mean? _____

Exercise 3 – Live 120Vac

Only if you are comfortable doing this one. **Safety first**!

Turn off the breaker for a wall switch that controls a lamp or light. Turn off the wall switch. Remove the switch cover and switch mounting screws. Leave the wires attached.

Pull the light switch out of the junction box, with wires attached, far enough to reach your probes to the two screws without touching any other metal surfaces. Turn the breaker back on and turn the light switch on. With the meter set to 120VAC, read the voltage across the two screws.

A. What did your meter read? _____.
B. Is this what you expected to see on the meter? _____
C. Can you explain why you got this reading?

_____
___

Exercise 4 – Continuity

Collect the following test items. One extension cord, a spare light switch, and any fuse or breaker if you have one lying around.

Set your meter to the continuity-beep setting if your meter has one; otherwise, select an ohm setting. When using the continuity function, put your probe ends together, and you should get a beep or a near “0” reading.

A. On the extension cord, measure from the wide prong on the plug to the smaller slot on the receptacle end. Did you get continuity? _____

B. Without moving the probe on the plug, place the other probe into the longer slot. Did you get continuity? _____

C. Check a fuse by touching the probes between the two metal surfaces. Was the fuse good or bad? _____ Switches and good fuses should read near "0" when tested.

D. If you have an unused light switch, touch a probe to each screw terminal. Do you have continuity? _____

E. Move the switch. What happens? _____

If the ohm reading is not zero or close to zero, it could indicate that the switch contacts are going bad and should be replaced. If you get "OL" when the switch should be closed, the switch is faulty as well.