

technical q&a

msac MANUFACTURERS' SERVICE ADVISORY Council

HOTLINE

The Manufacturers' Service Advisory Council provides expert answers to your technical questions

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Superheat

Many technicians use this formula to determine the appropriate superheat when checking the charge on a system. Target SH = [(3 x indoor wb) - 80 - outdoor ambient] / 2 (°F). Can you show us how this formula is derived? Knowing the math behind the formula is always helpful.

While rules of thumb terrify all of us, this formula is merely expressing the superheat value for a fixed bore AC system. See attached chart:

Indoor wb °F	Outdoor DB°F												
	55	60	65	70	75	80	85	90	95	100	105	110	115
50	9	7											
52	12	10	6										
54	14	12	10	7									
56	17	15	14	10	5								
58	20	18	16	13	9	5							
60	23	21	19	16	12	8	5						
62	26	24	22	19	15	12	8	5					
64	29	27	24	21	18	15	11	9	6				
66	32	31	30	28	23	18	15	11	9	6			
68	35	33	30	27	24	21	19	16	14	12	9	6	
70		35	33	30	28	25	22	20	18	15	13	11	8
72			33	31	30	28	26	24	20	20	17	15	14
74				34	31	30	27	25	23	22	20	18	16
76					35	33	31	29	27	26	25	23	21

Question from Andy Erbach of Rolling Meadows, IL. Answer from Bob Cone, Field Technical Consultant, Lennox.

Ghost Voltages

I would like to know how ghost volts are created. It's a very little talked about subject and I have only come across it once.

Ghost voltages are either created because a VERY low ampacity circuit path is present or due to inductance from other nearby energized conductors or components.

A digital multimeter's input impedance varies depending on what the input circuitry senses. Initially, the input impedance is on the order of two kilohms. So, when the leads are placed on the open circuit that contains a ghost voltage, the low input impedance will cause the ghost voltage to dissipate and the meter will display "OL" with the Ω symbol indicating the meter is still in the resistance function with no voltage present. When the leads are placed on a live circuit however, the input senses the presence of a "hard" voltage and automatically adjusts the input impedance to a much higher value and then displays the actual voltage present. This variable impedance design effectively eliminates reading ghost voltages on open circuits while still making accurate measurements on live power circuits without having to change meter settings.

So remember to put voltage readings in perspective when troubleshooting. The voltage is not an apparition, just a result of the physics of electricity.
Question from Nick Barnes of Indianapolis, IN. Answer 1 from Bryan Orr, Co-Founder, Kalos Services. Answer 2 from the Fluke Digital Library.

In Memory of...

Steve Esslinger, 65, of Surprise, AZ, passed away on April 17, 2017, after a long and courageous battle with cancer. Originally from Cincinnati, OH, Esslinger's career in refrigeration included positions at Kroger and Walmart before becoming a Sales Engineer at Sporlan. Later in his career, he worked for Zero Zone, and finally as the Southwest Regional Sales Manager for BITZER.

Esslinger sat on the board of the MSAC Hotline and possessed a wealth of knowledge that he was happy to share among his colleagues and the readers of RSES Journal. On behalf of the RSES Journal and entire staff of RSES we would like to give our condolences to Steve's family and friends. Our thoughts are with you and yours.