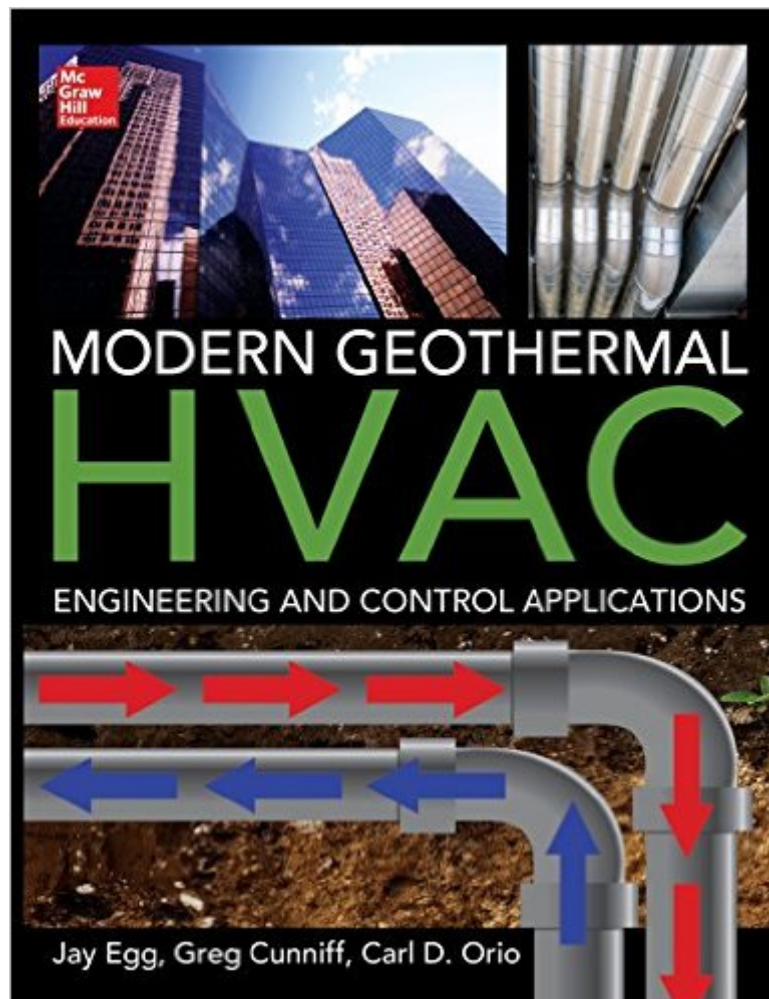


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# Modern Geothermal HVAC Engineering And Control Applications



## Synopsis

Best practices for the design and engineering of geothermal HVAC systems With a focus on market needs and customer goals, this practical guide explains how to realize the full potential of geothermal HVAC by integrating hydronic systems and controls at maximum capacity. Modern Geothermal HVAC: Engineering and Control Applications explains how to engineer and specify geothermal HVAC for building projects in varying geographic regions. Typical details on control parameters are provided. By using the proven methods in this innovative resource, you will be able to develop highly efficient, long-lasting, and aesthetically pleasing geothermal HVAC systems. Coverage includes: Low-temperature geothermal or earth coupling Geothermal heat-pump equipment Variations in earth coupling Application of earth coupling with regard to site conditions Closed-loop earth coupling and fusion Intermediate heat exchanger usage in geothermal applications Standing column and open geothermal systems Fundamentals of comfort, psychometrics, and thermodynamics Hydronic and air HVAC system basics Hydronic HVAC system equipment Variations and improvements to hydronic systems Control systems Load sharing and energy recovery Calculating system efficiencies, heat gain, and loss Geothermal rebates, incentives, and renewables legislation

## Book Information

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## Customer Reviews

Are you aware of the reputation of jay egg and his past history. My neighbor and I have spent approximately \$ 750, 000. With jay egg for installation of a geothermal hvac system. He has

screwed us royally, he took the money and ran. He has never finished either system. He has not paid his employees or subcontractors on this job and then closed his doors owing everyone. He deviated from the design and installed smaller plumbing, tried to substitute equipment for cheaper units, improper wiring for controls. Motors were running backwards and he did not know it. His plumbing was a disaster, pipes leaked all over causing \$ 48,000 in electrical and wall damage. My entire system had been redone in order to work correctly. In case you don't believe this nightmare I have pictures and total documentation of this nightmare. You owe it to yourself check him out. Don't get screwed like we did. Check out his law suits against him. I hope I at least saved a few of you from this guy. Try calling his business

First and Foremost I'm sold on Geothermal Ground-Water source cooling that Mr. Egg covers in both of his books. As a Civil Engineer and Builder I've seen many systems come and go. The systems described in this book are simple, logical and long lasting. Geothermal water-source cooling is a logical and green alternative to air cooled split-systems and cooling towers. In our Florida environment, cooling towers expel \$100k in water a year and split systems don't last. We have 75 degree ground water in Tampa year round, which is better performance than a cooling tower on a hot summer day. Glad to see the "HOW TO", Enjoy the book.

As an engineering physicist with four decades of work in the energy efficiency field, I had little knowledge of geothermal HVAC systems. It was in 2008 I began investigating residential energy efficiency opportunities for a twenty-five year old - 4,900 square foot lake lodge we purchased in Maine. At the time of purchase we knew this lodge was an energy hog. Over a seven year period we budgeted funds to redo the entire energy envelope. Modern Geothermal HVAC would have been a very valuable resource book for me back in 2008. My decision to ultimately go with a geothermal standing column well would have only taken a couple of weeks as opposed to two years of research and deliberation had the book been available then. Though the entire book was informative and insightful, the two most fascinating chapters for me were Chapters 1 and 15. The book addresses a number of misconceptions about geothermal technology. I was very interested in the book's comparison of geothermal versus heat pump technology. It was eye opening! I was pleasantly surprised to learn I was not unique in concluding a geothermal HVAC system was the right solution for our Maine lodge. There are presently over 600,000 geothermal systems across the U.S. Renewable energy solutions involving geothermal systems require only 30% of the capital outlay of wind; 25% the capital outlay of solar. As energy costs continue to rise, Modern Geothermal

HVAC's facts and insights will likely contribute significantly to the future growth of the geothermal industry. I recommend that anyone who is seriously considering taking control of their energy costs, business or residential, should consider reading Modern Geothermal HVAC before making a major energy capital commitment.

The book does a good job explaining the various types and components of ground source heat pump (GSHP) systems and how they interact with HVAC system components often found in today's commercial and institutional buildings. It covers best practices learned in the field, the hard way. It hammers home the Achilles heel of too many closed loop installations: over saturation of the earth heat sink and the failures it causes. However, it is not an engineering book. It does not go over how to size a system or its components, other than simply leading one to use commercially available software. It is very weak on how one engineers a system, other than "this is why you need this". It throws in a few equations in an attempt to go over some basics but the equations lead nowhere. The book best shows you what to do and what not to do, but not how, engineering wise, to do it. The book is a worthwhile critical introduction for anyone interested the GSHP field and an important resource for those already in the field.

Jay Egg's work with the best in the business has resulted in a gem of comprehensive knowledge about efficient heating and cooling with renewable energy from the earth. It truly is a volume of best practices for the design and engineering of geothermal HVAC systems. Much appreciated is its treatment of the market and what customers want. In addition, its focus on hydronic systems and controls will be greatly appreciated by both new and veteran engineers. Anyone interested in geothermal heat pump systems - including everyone from home and business owners to institutional management and pro installers - should have a copy of this book. It is truly a "bible" of the technology.

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