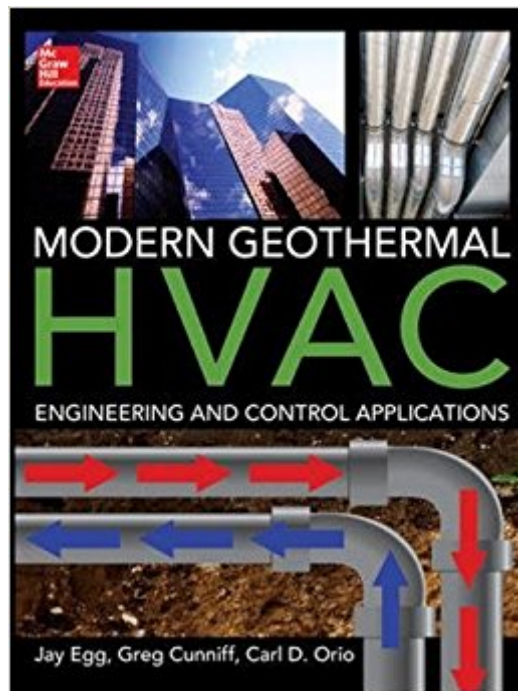




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# Modern Geothermal HVAC Engineering And Control Applications



## 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, psychrometrics, 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

After writing my first book, Geothermal HVAC, Green Heating and Cooling, I was determined to get

back to work and enjoy some of the validation that comes from being a published author of a professional/technical book from McGraw-Hill. Indeed, the validation came. The problem was that it was written for the layman; designed to provide readers with the knowledge needed to make educated decisions when entering into a geothermal HVAC project. ã Å The demand was overwhelming for a comprehensive textbook on the subject of geothermal HVAC engineering. As a result, McGraw-Hill commissioned myself Greg Cuniff, and Carl Orio to write this book, Modern Geothermal HVAC Engineering and Controls Applications. ã Å We are confident you will find the information for which you are looking within the pages of this book. There is no doubt it will be a bestseller, as it is already outpaced the sales of the first book, even before publication. Thank you for your interest.

Jay's passion for geothermal air-conditioning and heating started during a repair to his own home air-conditioning system on Labor Day weekend in 1989. Frustrated by the extreme tropical climate which had added to the premature failure of his air-conditioning system, he modified his home air conditioner to become a ground water-cooled system. As he explored the opportunities which resulted from this successful discovery, he found there were others that shared his vision.ã Å Jay founded EggGeothermal in 1990 to provide geothermal HVAC systems to the Florida market. The result was immediate acceptance as EggGeothermal did very well with the technology, being featured on several network affiliated news stations and featured in many newspapers and magazines, receiving many opportunities to train and speak on geothermal technologies. With the resurgence of interest in sustainable technologies, EggGeothermal entered into a new age of acceptance, and was able to quickly take its place among the leaders in renewable energy technologies, specifically geothermal sourced applications. Jay and co-author Brian Howard accepted the invitation to write a professional book from McGraw-Hill on the subject, and Geothermal HVAC, Green Heating and Cooling was published to a worldwide audience in 2010. The resulting validation and interest from publishing of this book have provided numerous opportunities for Mr. Egg. Jay and co-writer Greg Cuniff accepted the opportunity to write a graduate-level textbook for McGraw-Hill. Modern Geothermal HVAC Engineering and Controls Applications will be published to a worldwide audience in April of 2013. Jay currently focuses his professional efforts on geothermal consulting, writing, and speaking engagements. Among his clients are federal, state and local governments, developers, associations, and private entities.

I expected a technical book on Geothermal systems. Regrettably this is on the level of a power point

presentation provided for a 1 day seminar. Poorly illustrated. Pictures of: an indoor pool (Figure 1-9), a women sunning herself on the beach (Figure 8-11) a guy and a girl sitting by a space heater (Figure 8-3), a young women looking out a window (Figure 8-20), an older guy hugging himself (Figure 8-19), the Author's family in a restaurant (3-24), an illegible photo showing the inside of a geothermal heat pump, people warming their hands over a radiator (Figure 8-10), countless trivial and barely legible diagrams that look like they were created with a children's CAD program are substituted for example wiring diagrams, detailed piping diagrams, control diagrams, equipment descriptions etc. This is laziness. Good technical description is difficult. Professional looking detailed and technically accurate and telling illustrations take a lot of time. Regrettably I purchased this from .

This is a tech manual, so be prepared. If you are new to geothermal or just want a nuts and bolts version of what it is, this book is probably way too much info. For a techie person or someone who does HVAC for a living, it is very good, precise, up to date on technology and instruction.

I found this "marketing literature" to be highly repetitive, proprietary, and read like a stream of consciousness. The text is absolutely peppered with cheesy analogies. I noticed that the author exercised great care to not share anything too practical. It appears that the intent is to merely promote the author's "consulting" practice. If you are looking for a companion piece to the Kavanaugh standard, this is not it.

This is certainly one of the best, if not the best, book on geothermal HVAC on the market today. It is comprehensive in its information and especially valuable for understanding the loop field. Various options for loop fields are discussed and explained. I recommend this book to anyone interested in learning about geothermal. However, I think the author does stretch a bit - there is a fair amount of repetitiveness where one chapter will cover a lot of the ground a previous one did, even using similar sentences and paragraphs. There is also some superfluous discussion of general HVAC toward the back of the book that seems like filler. I also disagree with the author's vehemence about not recommending closed-loop geothermal systems for commercial projects. Standing columns and wells are fine in Florida and Northeast, but in the Midwest where the geology is different and cooling a little less dominant, closed loop systems can be effective. There are also add-ons to closed loop systems such as Greensleeves LLC's GeoModule software that can make closed loop systems efficient and effective even in very cooling-dominant applications. But weighing the pluses and

minuses, this is a book worth reading.

Its a hard read, Jay Egg wrote a manual, not a novel so its what I should have expected.

As a Geothermal engineer and installer I found Modern Geothermal HVAC an excellent text for the advanced geothermal expert. Mr. Eggs first Geothermal book is an excellent introduction to Geothermal heating and air conditioning and a perfect guide for the consumer to become knowledgeable about selecting a geothermal system and working with a contractor. This new textbook combines the world class expertise of Mr. Egg, Mr. Orio and Mr. Cunniff. Modern Geothermal HVAC engineering and control brings detailed engineering knowledge to the geothermal designer and installer that is often lacking. As a Geothermal professional I see many costly geothermal systems installed that do not function properly due to a lack of engineering knowledge. This book is an excellent guide for the technically savvy that have an interest in Geothermal HVAC to the graduate engineer or HVAC instructor that needs an excellent educational resource. It should be a standard in any advanced HVAC curriculum. I found the sections on Standing Column Wells, controls, load sharing and Hydronics particularly excellent. This book also does an excellent job of advancing the use of open loop and Standing Column well systems versus the age old and often poorly designed or inappropriately selected, sized and installed closed loop systems for systems requiring more than 3 to 4 Tons. Geothermal heating and air conditioning are rapidly becoming the superior solution worldwide for new homes, commercial and industrial facilities. It is elegant, clean, efficient and the most reliable technology available. This book is a must buy for anyone in the Geothermal or HVAC industry.

This book is a must have for any engineer working in HVAC/Geothermal. As a mechanical engineer with lots of experience with geothermal system; this book open my eyes. It is very simple to read and understand.

Upon reading Jay's first book entitled Geothermal HVAC, Green Heating and Cooling, I wanted more. Jay is experienced in geothermal HVAC, wise, and great at explaining things. This makes for a fun and educational experience. After the first book my main concern that there was not more technical information to read from this man. This second book, Modern Geothermal HVAC Engineering and Controls Applications, was an answer to both the first book and my questions. Modern Geothermal HVAC Engineering and Controls Applications really goes over a lot.

For any designer of closed loop, open loop, or standing column systems this is a book to buy and keep at your disposal. Conor Rickard

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