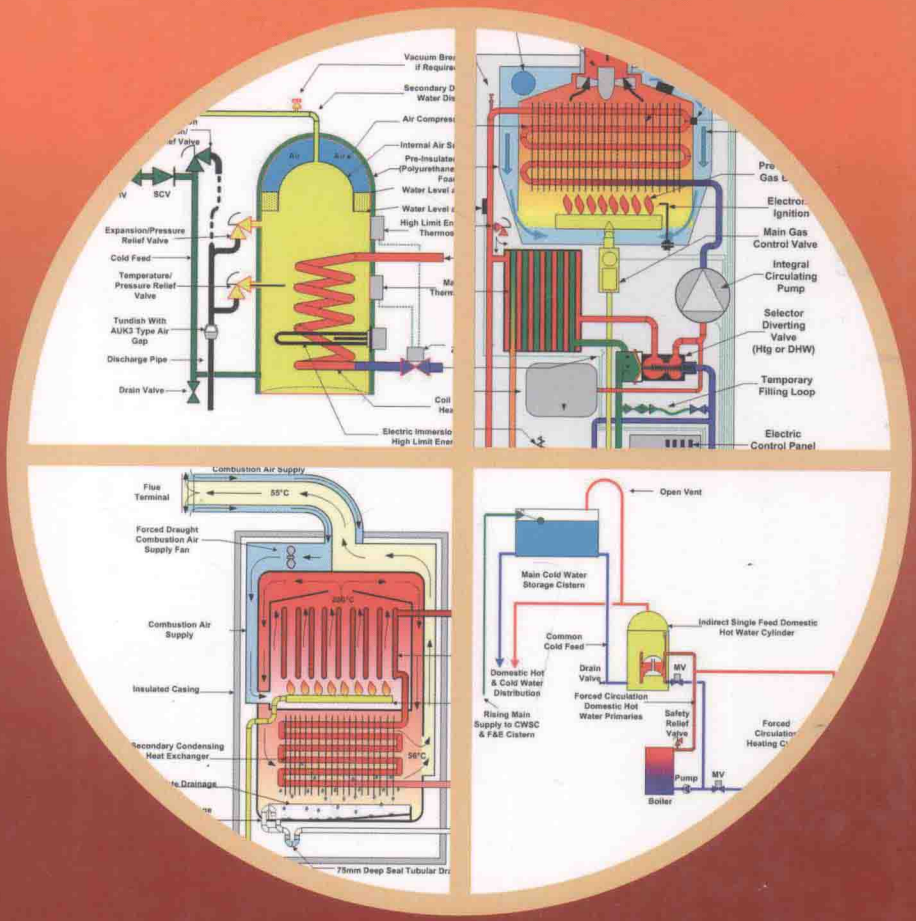
Heating Services in Buildings

David E. Watkins



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Heating Services in Buildings

Design, Installation, Commissioning & Maintenance

David E. Watkins

I Eng, FCIPHE, FSoPHE, MASHRAE, AffCIBSE, MIfL RP

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Heating Services in Buildings

Preface

There have been a number of books written on the subject of heating over the years, which would fill a sizable section of any notable library if collected together.

On examining the more recent of these books, that is those published over the last twenty years, it was found that they could be categorised as belonging to one of three groups. These are books written for the DIY market which are of little use to any student who is serious about studying to become a qualified heating professional. Alternatively, there are a number of books aimed at the craft level student concentrating only on the practical aspects of the subject. The third category of technical books, of which there are fewer available, has been written for the qualified professional engineer that assumes the student has previously obtained the basic engineering knowledge that is required to advance to a higher level of their education.

This observation becomes apparent when looking for a suitable technical book to support the NVQ Level 4 Higher Professional Diploma in Building Services Engineering and other design based engineering courses.

The search found that no single book was available to support these courses and the student would have to purchase a large number of publications to cover the subject to the extent required. This would also result in the student incurring a high financial cost to obtain copies of these publications.

The answer to this situation was to produce a number of supporting handout papers that expanded upon the course lectures that eventually developed over the years into a sizable set of notes when bound together.

During the course of developing these supporting notes, the subject of heating buildings, both for domestic residential properties and commercial buildings, has changed enormously, particularly with regard to the need to conserve energy, develop alternative forms of energy and provide controls that are suitable for the system's needs.

This requirement has manifested itself in the form of increased mandatory regulations and improved technology that has been developed to meet these compulsory regulations and conservation targets.

It was that necessity to incorporate explanations and detailed information on these changes that led to the set of supporting notes being developed into the basis of this book.

The aim of this work is to provide in a text and illustrative form a complete guide from basic principles to an advanced level to all the elements that combine to impart the engineering knowledge required on the subject of hydronic heating systems.

The book has been arranged to present the subject matter in a logical order that builds on each preceding chapter and culminates to provide the complete informative material. The book also demonstrates that there is little difference between domestic and commercial heating systems in the approach to the engineering and design of the systems, but makes mention where there is a difference.

This book has been developed over many years from the collection of handout notes to its present volume, where it originally supported a City & Guilds supplementary heating course, which further developed to support the heating design and installation course accredited by the European Registration Scheme (ERS) and other similar academic courses presently run today.

It is also intended that this volume will support Unit 11, 'Space heating technology and design', which is a module contained in the NVQ Level 4 Higher Professional Diploma in Building Services Engineering.

The book is aimed at both craft level plumbing students qualified to NVQ Level 3 standard aspiring to bridge the educational gap to an engineering career, plus school leavers with the necessary academic 'A' level qualifications and employed in a building services engineering consultancy.

Although this volume has been produced to support the NVQ Level 4 course and similar design/engineering courses, it is hoped that it will be of equal interest and use to anyone concerned with the design and installation of hydronic heating systems.

This book has resisted the inclusion of over explaining or illustrating elements in order to provide the information in an affordable manner to all those concerned. This gives the lecturer the opportunity to expand upon each subject and provide further examples in the classroom.

It is also correct to acknowledge that a work of this type has only been possible due to the encouragement and assistance of many other people, most notably Mr David Bantock, whose original set of notes I inherited when I started as a part-time lecturer delivering the course, and who has been instrumental in his encouragement during its development. Also my wife, Jenny Watkins, for proofreading and endless patience, and the many students who encouraged its eventual publication.

Special acknowledgement should also be mentioned for permission to reproduce Figure 5.23, Room Height Temperature Gradients, from Elsevier Publishing, which is based on a similar illustration in their book entitled Faber & Kell's Heating & Air-conditioning of Buildings. Also, for permission granted by Baxi Heating to reproduce Figure 15.8, Illustration of a Micro-Combined Heat and Power Generating Unit and M H Mear Co. Ltd for permission to reproduce Figure 7.3, of a Mear's Slide Rule Heating Calculator.

David E. Watkins

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