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Nota di contenuto	Front Cover; Geothermal Heat Pumps; Copyright Page; Table of Contents; Preface; Introduction by Robin H. Curtis; List of Acronyms and Abbreviations; 1. Reasons to Use a Heat Pump; 1.1 Environmental benefits; 1.1.1 Our environment is in danger; 1.1.2 Tracking down the culprit; 1.1.3 Heat pumps offer emission-free operation on-site; 1.2 Operating costs; 1.3 Independence; 1.4 Comfort; 1.5 Security for the future; 1.6 Non-flammability; 1.7 Responsibility for the future; 1.8 Ideal for low energy houses; 1.9 Retrofit; 1.10 Multiple functions; 1.11 Public promotion; 1.12 Energy politics/laws 2. Theory of the Heat Pump 2.1 The principle; 2.2 The refrigeration cycle; 2.3 Coefficient of performance; 2.4 Carnot Cycle; 2.5 Working fluid/refrigerant; 2.6 Enthalpy-pressure diagram; 2.7 Heat pump cycle with injection cooling; 3. Heat Pump Types; 3.1 Brine/water, water/water heat pump; 3.1.1 Refrigeration cycle; 3.1.2 Refrigerant; 3.1.3 Electrical components and controller; 3.1.4 Safety measures; 3.1.5 Display; 3.2 Direct expansion/water heat pump; 3.2.1

Refrigeration cycle; 3.2.2 Refrigerant; 3.2.3 Electrical components and controller; 3.2.4 Safety measures; 3.2.5 Display  
3.3 Direct expansion/direct condensation heat pump  
3.4 Air/water heat pump - split units; 3.4.1 Refrigeration components - indoor unit; 3.4.2 Refrigeration components - outdoor unit; 3.4.3 Refrigerant; 3.4.4 Electrical components and controller; 3.4.5 Safety measures; 3.4.6 Display; 3.5 Air/water heat pump - compact units, indoor installation; 3.5.1 Refrigeration cycle; 3.5.2 Refrigerant; 3.5.3 Electrical components and controller; 3.5.4 Safety measures; 3.5.5 Display; 3.6 Air/water heat pump - compact units, outdoor installation; 3.7 Domestic hot water/heat pumps - air source, split units  
3.7.1 Refrigeration cycle  
3.7.2 Refrigerant; 3.7.3 Electrical components;  
3.8 Domestic hot water heat pump - air source, split units; 3.9 Ground/water heat pump - domestic hot water heat pump - air source, split units; 3.10 Air/air heat pump - ventilation; 3.11 Exhaust-air heat pumps, additional designs; 3.12 Heat pumps for air heating/cooling; 4. Complete System Planning; 4.1 Planning a heat pump heating system; 4.2 Heat source selection; 4.3 Heating system selection; 4.4 Heat pump selection; 4.4.1 Determination of heating demand; 4.4.2 Utility interruptible rates  
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4.4.4 Operation configurations; 4.4.5 Heat pump selection; 4.5 Retrofit/renovation; 5. Planning Instructions for Ground Heat Source - Brine Systems (Horizontal Collector, Trench, Vertical Loop); 5.1 Ground heat source; 5.1.1 System description; 5.2 Ground conditions; 5.3 Layout and installation of ground collector; 5.3.1 Horizontal collector installations; 5.3.2 Trench collector/spiral collector; 5.3.3 Vertical loop; 5.4 Connection; 5.4.1 Collection vault; 5.4.2 Safety clearance; 5.4.3 Building penetrations; 5.5 Brine circulation loop; 5.6 Commissioning  
5.7 CO2 loop

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## Sommario/riassunto

Geothermal Heat Pumps is the most comprehensive guide to the selection, design and installation of geothermal heat pumps available. This leading manual presents the most recent information and market developments in order to put any installer, engineer or architect in the position to design, select and install a domestic geothermal heat pump system. Internationally respected expert Karl Ochsner presents the reasons to use heat pumps, introduces basic theory and reviews the wide variety of available heat pump models.

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