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Nota di contenuto	Machine generated contents note: 1. Introduction -- 1.1. The modelling quest -- 1.2. Water-bath modelling -- 1.3. The theoretical basis -- 1.4. Applicability of water-bath modelling -- 1.5. The cases examined -- 2. Some preliminaries -- 2.1. Various conservation laws -- 2.1.1. Conservation of mass -- 2.1.2. Conservation of thermal energy -- 2.1.3. Conservation of buoyancy flux -- 2.2. Equilibrium and neutral level -- 2.3. Bernoulli's theorem -- 2.4. Effective opening area -- 2.5. Application of the basic principles -- 3. Sources of identical sign -- 3.1. Residual buoyancy -- 3.1.1. Mixing ventilation -- 3.1.2. Displacement ventilation -- 3.2. The localised source -- 3.2.1. Plume theory -- 3.2.2. Sealed enclosure -- 3.2.3. Ventilated enclosure -- 3.2.4. Transient responses -- 3.2.5. Multiple localised sources -- 3.3. The distributed source -- 3.3.1. Steady-state flow regime -- 3.3.2.

Evolution to steady state -- 3.4.A combination of the localised source and the distributed source.
Contents note continued: 4. Sources of opposite sign -- 4.1. Flushing with pre-cooled air -- 4.2. Pre-cooled ventilation of occupied spaces -- 4.2.1. Cooling to above ambient air temperature -- 4.2.2. Cooling to below ambient air temperature -- 4.3. Maintained source of heat and internal cooling -- 4.3.1. Distributed source of heat and distributed source of cooling -- 4.3.2. Localised source of heat and distributed source of cooling -- 4.3.3. Localised source of heat and localised source of cooling -- 5. Some common flow complications arising from more complex geometries -- 5.1. Openings at more than two levels -- 5.1.1. Multiple stacks -- 5.1.2. Multiple side openings -- 5.2. Multiple connected spaces -- 5.2.1. Multi-storey buildings -- 5.2.2. Spaces connected sideways.

Sommario/riassunto

This book describes in depth the fundamental effects of buoyancy, a key force in driving air and transporting heat and pollutants around the interior of a building. This book is essential reading for anyone involved in the design and operation of modern sustainable, energy-efficient buildings, whether a student, researcher or practitioner. The book presents new principles in natural ventilation design and addresses surprising, little-known natural ventilation phenomena that are seldom taught in architecture or engineering schools. Despite its scientific and applied mathematics subject, the book is written in simple language and contains no demanding mathematics, while still covering both qualitative and quantitative aspects of ventilation flow analysis. It is therefore suitable for both non-expert readers who just want to develop intuition of natural ventilation design and control (such as architects and students) and for those possessing more expertise whose work involves quantifying flows (such as engineers and building scientists).