

## PREFACE

The 2023 *ASHRAE Handbook—HVAC Applications* comprises 67 chapters—our largest and most extensive volume yet—covering a broad range of facilities and topics, written to help engineers design and use equipment and systems described in other Handbook volumes. Main sections cover comfort, industrial, energy-related, general applications, and building operations and management. ASHRAE Technical Committees in each subject area have reviewed all chapters and revised them as needed for current technology and design practice.

There are two new chapters for this edition:

- [Chapter 23](#), Fire and EMT Stations and Training Academies, describes best practices for conditioning and ventilating these vital facilities.
- [Chapter 66](#), In-Room Air Cleaners, covers use of in-room filtration to address air contaminants, with a special focus on removing pathogens.

This volume has been greatly expanded and updated; just a few of the most notable revisions include the following:

- [Chapter 4](#), Tall Buildings, has expanded its discussion of the neutral pressure level (NPL) and added a new worked example.
- [Chapter 8](#), Educational Facilities, has updated design criteria and new content on air distribution, DOAS system controls, UVGI, in-room air cleaners, air quality monitoring, medical suite design, and energy dashboards and energy management systems.
- [Chapter 20](#), Data Centers and Telecommunication Facilities, updated its coverage of thermal envelopes and added discussions of cooling types, commissioning, fire protection, water concerns, chillers, and economizers.
- [Chapter 36](#), Solar Energy Use, expanded its discussion of photovoltaics and added information on green hydrogen as an energy source.
- [Chapter 38](#), Owning and Operating Costs, added information on building information modeling (BIM), computerized maintenance management systems (CMMS), building automation systems (BAS), and automated fault detection and diagnosis (AFDD).
- [Chapter 51](#), Service Water Heating, greatly expanded its discussion of hot-water load and equipment sizing, and incorporated detailed information about hotel hot-water heating system sizing from ASHRAE research project RP-1544.
- [Chapter 56](#), Seismic-, Wind-, and Flood-Resistant Design, added a new section on flooding resilience, as well as expanding its discussions of seismic and wind resistance.
- [Chapter 65](#), Occupant-Centric Sensing and Controls, added information on solicited and unsolicited categories of occupant comfort feedback, recent studies in the field, and greater detail about modeling tools and best practices.

This volume is published as a bound print volume, in PDF format, and online, in two editions: one using inch-pound (I-P) units of measurement, the other using the International System of Units (SI).

Corrections to the 2019, 2020, and 2021 Handbook volumes can be found on the ASHRAE website at [www.ashrae.org](http://www.ashrae.org) and in the Additions and Corrections section of the 2022 volume. Corrections for the 2018 volume will be listed in subsequent volumes and on the ASHRAE website.

Reader comments are enthusiastically invited. To suggest improvements for a chapter, **please comment using the form on the ASHRAE website** or write to Handbook Editor, ASHRAE, 180 Technology Parkway, Peachtree Corners, GA 30092, or e-mail [hkennedy@ashrae.org](mailto:hkennedy@ashrae.org).

Heather E. Kennedy  
Editor