

COPYRIGHT 1959

BY THE

AMERICAN SOCIETY OF HEATING AND
AIR-CONDITIONING ENGINEERS, INC.

AND BY IT

DEDICATED

TO THE ADVANCEMENT OF

THE PROFESSION

AND

ITS ALLIED INDUSTRIES

TEXT AND ILLUSTRATIONS ARE FULLY PRO-
TECTED BY COPYRIGHT AND NOTHING THAT
APPEARS MAY BE REPRINTED EITHER WHOLLY
OR IN PART WITHOUT SPECIAL PERMISSION.

Printed and Bound by
WAVERLY PRESS, INC.
BALTIMORE • MARYLAND
U. S. A.

Pub.
Comp.
1959

Ref. 628.8

PREFACE TO THE 37th EDITION

The HEATING VENTILATING AIR CONDITIONING GUIDE, 1959, has been enlarged to 8½ x 11 inch page size for the purpose of providing additional space for new technical text and for enlargement of many illustrations, working charts, and tables. The use of larger type and open spacing in tables will be of particular advantage, for instance, in selecting heat transfer coefficients for various types of building construction or finding degree days for various cities.

This edition has 286 new or revised diagrams and charts. In most cases the enlarged page size has made it possible to place illustrations very close to their first mention in the text.

Five new chapters have been added on the following subjects: (1) high-temperature water systems, (2) the heat pump, (3) evaporative apparatus for heat rejection, (4) evaporative air cooling and humidification, and (5) snow melting.

Outstanding improvements made in chapters continued from the previous edition include (1) new outdoor winter design temperatures based on probability of occurrence of various temperatures, (2) new steam pipe sizing charts and tables based on Moody friction data for steam flow, (3) a revised table on gages and construction of air ducts including low-, medium-, and high-pressure ducts, (4) revised information and illustrations for unit ventilators and their application, (5) a rewritten chapter on automatic control with new illustrations of control applications, (6) general revision of the information on sorbents, including their use at elevated pressures, (7) data on heat transfer coefficients for ventilated attics, (8) revised information on sound absorption in ducts and plenums, noise levels, and diffuser noise, (9) up-to-date values for maximum allowable concentration of contaminants in occupied spaces, (10) a new section on the absorption refrigeration system, (11) a new section on the gas-fired year-round residential air conditioner, (12) new data on duct construction for residences, (13) a revised discussion of fuel utilization, efficiency, and consumption, (14) a rewritten chapter on school systems, and (15) additions and changes in the list of codes and standards.

More detailed information regarding the changes in the various chapters:

Chapter 7—Air Contaminants. Additions and revisions have been made in the tables of maximum allowable concentration of toxic gases, vapors, dusts, fumes, and mists, in order to have these values conform to those adopted by the American Conference of Governmental Industrial Hygienists in 1958.

Chapter 9—Heat Transmission Coefficients of Building Materials. A section on ventilated attic coefficients, with examples, has been added. The section on the practical use of overall coefficients has been revised. The tables of heat transmission coefficients for various building constructions have been enlarged to facilitate their use. All wall and roof constructions have been numbered to aid in identifying and referring to the coefficient for a particular construction.

Chapter 10—Moisture in Building Construction. The information on moisture migration and its calculation has been revised. The discussion of condensation in cooled structures has been extended.

Chapter 12—Heating Load. The data on winter outdoor temperatures have been revised to show as design values for the United States the minimum average daily temperatures that have the probability of occurring once in 40, 20, 13, 10, or 5 years as determined from U. S. Weather Bureau records. The discussion of design temperatures has been rewritten to

explain the use of these new values. The tables have been enlarged in type and size for easier readability.

Chapter 16—Unit Ventilators and Unit Heaters. The discussion of unit ventilators has been enlarged and thirteen new illustrations have been added. The illustrations of piping connections to unit heaters have also been revised.

Chapter 18—Unitary Air-Conditioning Equipment. A section discussing the features, design considerations, selection, and installation of room air conditioners has been added.

Chapter 17—Electric Heating. This chapter was rewritten to include information on present heating units and methods of use.

Chapter 18—Warm Air Heating Systems. The information on ducts has been revised to include recommended gages for residential systems.

Chapter 20—Air Distribution. The sections on principles of air distribution and on ventilating jets have been rewritten and simplified.

Chapter 21—Air Duct Design. A revised section on construction includes data on high-, medium-, and low-pressure ductwork, coordinated with the recommendations of the Sheet Metal and Air Conditioning Contractors National Association. The charts for friction loss in ducts and the table of equivalent sizes of round and rectangular ducts have been enlarged.

Chapter 25—Sound Control. Data on noise levels in offices have been added. The section on noise from axial-flow fans has been enlarged. New information is given on diffuser noise. The sections on sound attenuation in ducts and plenum absorption have been revised.

Chapter 26—Steam Heating Systems. The information on steam pipe sizing has been rewritten to include a new basic chart (0 to 200 psig) based on the Moody friction data which take into account the Reynolds number and its effect on the friction factor, and to include also new charts for 30, 50, 100, and 150 psig and tables for 3.5 and 12 psig. (The new information, charts, and tables were prepared by the ASHAE Research Laboratory under the direction of the Technical Advisory Committee on Hot Water and Steam Heating.) The section on pressure-reducing valves has been enlarged by the addition of information formerly given in the chapter on District Heating.

Chapter 28—Hot Water Heating Systems. A new chart for available gravity head has been added.

Chapter 29—High-Temperature Water Systems. A new chapter has been added giving a general idea of the principles and practices that apply to high-temperature systems and discussing significant considerations for designing these systems. Many new illustrations showing piping arrangements were used.

Chapter 34—Automatic Fuel-burning Equipment. There has been a general revision of this chapter to bring the information up-to-date. A new chart for calculating friction drop or capacity for gas flow in piping has been added.

Chapter 35—Heating Boilers, Furnaces, and Space Heaters. The data on steel boilers have been improved and enlarged.

Chapter 37—Estimating Fuel Consumption for Space Heating. The former section on seasonal efficiency has been replaced by a new section on Efficiency of Utilization and the section on Calculated Heat Loss Method has been rewritten.

Chapter 38—Refrigeration. The information on absorption systems has been revised and new illustrations have been added.