

Hot-wire anemometer, 69, 660

#### Human body

adaptation, 47  
cold conditions, 51  
hot conditions, 50  
heat emission, 52, 54, 786  
odors, 42  
temperature, 47  
zone of evaporative regulation, 50

#### Humid heat, 816

#### Humidification, 379, 523

control, 380, 642  
mechanical furnace systems, 379  
residence requirements, 380

#### Humidifier, humidifiers

air washer, 523  
atomizing, 525  
high duty, 526  
spray, 379, 430, 521, 525  
units, 427

#### Humidity, 816

air conditioning units, 430  
Humidistat, 642, 816

#### Humidity, 816

absolute, 813  
drying, 739  
influence of, 67  
measurement of, 662, 739  
nurseries for premature infants, 688  
permissible relative, 108  
ratio, 9, 817  
relative, 19, 818  
Hydraulic radius, 76  
Hygrostat, 642, 817

### I

#### Ice systems, 487

Impulse trap, 278  
Inch of water, 817  
Induction dryer, 734  
Induction units, 403  
high pressure types, 404  
low pressure types, 403

#### Industrial

air conditioning, 705  
exhaust systems, 717 (see *Exhaust systems*)  
humidities, 706  
processes, 706  
temperatures, 706

#### Infiltration

causes, 117  
due to wind pressure, 117  
heat equivalent, 129  
heat losses, 126  
latent, 127  
sensible, 126  
temperature difference, 123  
through outside doors, 122  
through windows, 119, 120  
through walls, 118

#### Inside temperature, 127

#### Instruments, 654

#### Insulation, 817

economical pipe thickness, 355  
gravity furnace duct, 360  
low temperature pipe, 351  
pipes to prevent freezing, 353  
underground pipe, 357  
Intermittently heated buildings, 140  
Intermittent condensation, 110  
Ionization, 45  
Iron elbow equivalents, 307  
Isobaric, 817  
Isothermal, 817

### J-K-L

Joints, duct, 611

Kata thermometer, 258, 659

Latent heat, 127, 394, 817

loss, 127, 394

Laws of thermodynamics, 817

Leaders, 358

#### Leakage of air, 117

door, 119

window, 119

Light heat gain, 158

Lignite, 174

Lint, 554

Liquid

absorbents, 450

heat of, 846

Lithium chloride, 451

#### Load

cooling, 32, 146, 390, 588

design, 815

heating, 35, 125, 392, 588

maximum, 815

refrigeration, 146, 164

### M

#### Machine vibration, 635

Manometer, 657, 817

#### Marine heating and ventilation, 835

factors affecting design, 837

general considerations, 835

insulation of hull, 845

ducts, 846

requirements for space, 841

bakery, 843

bath, 843

cargo, 844

food handling, 843

galley, 843

laundry, 844

living, 843

shower, 843

storeroom, 844

toilets, 843

washroom, 843

Mass, 817

Mb, 817

Mbh, 817

Mean radiant temperature, 69, 786, 792

#### Mechanical

circulators, 304

draft, 185

towers, 536

equivalent of heat, 817

furnace systems, 371

air distribution, 373

control, 375

cooling methods, 380

dampers, 375

design, 376

ducts, 375

fans, 373

filters, 373

heavy duty, 379

humidification, 379

methods of design, 381

motors, 373

registers, 374

refrigeration, 405

return heating system, 261

stokers, 201

#### Meter, meters

condensation, 768

differential, 769

flow, 768

fluid, 768

Nicholls heat, 663

orifice, 769

plug, 768

vacuum condensation, 840

velocity, 768

venturi, 659

Methyl chloride, 469

Micromanometers, 657

Micron, 817

Moist air, 8

saturation, 9

volume, 20

#### Molsture, 711, 741

content, 713

permeability, 158, 160

regain, 709, 711

Mol, 817

Mollier diagram, 23

border scale, 31

Monofluorotrichloromethane, 472

#### Motor, motors, 665

adjustable speed, 666

alternating current, 667

capacitor type, 668

classification, 674

compound wound, 666

constant speed, 666

control equipment for, 677

direct current, 665

electric, 139

enclosures, 676

heat generated by, 159

polyphase, 670

repulsion induction, 669

series wound, 666

shunt wound, 665

single phase, 668

speed characteristics, 666

split phase, 669

squirrel cage induction, 670

synchronous, 676

wound rotor, 673

Multiblade fans, 571

### N

#### Natural draft, 185

towers, 535

#### Natural ventilation, 751

general rules, 757

heat removal, 752

#### Noise, noises

air conditioning system, 591

air supply opening, 631

apparatus for measuring, 620

cross transmission between rooms, 634

design room level, 622

duct sound absorbers, 625

duct system attenuation, 624

generated by fans, 623

kinds of, 622

through building construction, 635

transmitted through ducts, 622

unit of measurement, 619

#### Nurseries for premature infants, 687

air conditioning equipment, 689

air conditioning requirements, 688

### O

#### Occlusion of solar radiation, 550

Odors, 42

human body, 42

#### Oil, oils

classification of, 179

combustion of, 179

estimating consumption, 231

#### Oil burners, 210

boiler settings, 215

combustion adjustments, 214

combustion process, 213

commercial, 216

controls, 216, 646

domestic, 210

furnace design, 215

measurement of efficiency of combustion, 215

mechanical draft, 210

operating requirements, 213

#### One-pipe system, 262, 303

gravity air-vent, 262

hot water, 303, 817

steam, 262, 817

supply riser, 285, 817

unit heater connection, 295, 420

vapor, 265

#### Opening, openings

air supply noises, 631

types of, 756

doors, 756

roof ventilators, 756, 757

skylights, 756

stacks, 757

windows, 756

#### Operating rooms, 683

conditions, 685

reducing explosion hazard, 683

sterilization of air in, 686

#### Operative temperature, 48

Orifice heating systems, 272

Orsat apparatus, 664

#### Outdoor air, 389

#### Outlet, outlets

air supply noises, 631

ceiling, 586, 587

duct approaches, 584

sound absorbers, 629

#### Outlet locations, 588

cooling load, 588

heating load, 588

#### Outside temperature, 130

Overhead distribution, 263, 766, 802

Overhead system, 817

#### Oxygen

chambers, 694

tents, 694

therapy, 693

Ozone, 45

### P

#### Panel heating, 788, 789

electric, 790

hot water, 789

steam, 788

warm air, 788

Panel radiator, 817

Particle size chart, 546

Per cent of saturation, 19

Perforated ceilings, 587

Perforated outlets, 586

Phon, 619

Physical impurities in air, 45

#### Physiological principles, 41

four vital factors, 69

Pilot controls, 678

Pipe coils, 253

heat emission, 253

wall, 253

#### Pipe, piping, 323

capacity, 285

coil connections, 297

commercial dimensions, 325

conduit for, 763

connection to heating units, 296

corrosion, 341

design, hot water system, 313

direct return, 322

forced circulation, 314

gravity, 314

one-pipe forced circulation, 319

one-pipe gravity circulation, 318

two-pipe forced circulation, 317

two-pipe gravity circulation, 315

reversed return, 321

economical thickness insulation, 355

expansion, 328

ittings, 331

fitting equivalent, 284

flexibility, 328