

Pipe, piping (continued)

heat losses, 344
 hot water heating systems, 303
 inside, 766
 insulation prevent freezing, 353
 leader sizes, 362, 365, 366
 low temperature insulation, 351
 materials, 323
 overhead distribution, 766
 proportioning wall stacks, 360, 362
 return ducts, 360, 363, 367
 recirculating grilles, 363
 refrigerant sizes, 486
 register selections, 362, 363
 return connection, 364
 sizes, 283
 high pressure steam, 293
 hot water forced circulation, 305
 hot water gravity circulation, 305
 indirect heating units, 299
 initial pressure, 283
 maximum velocity, 283
 one pipe riser, 282
 orifice systems, 289
 pressure drop, 283
 sub-atmospheric systems, 299
 tables for, 287
 two-pipe gravity air-vent system, 289
 two-pipe riser, 282
 two-pipe vapor systems, 290
 vacuum systems, 291
 water supply systems, 801
 steam distribution, 761
 steam heating systems, 279
 supports, 330
 symbols for drawing, 826
 tax, 243
 threads, 330
 thread connections, 330, 334
 tunnels, 765
 underground insulation, 357
 unit heater connections, 419
 water supply, 801
 Pitot tubes, 658
 Plate cell, 628
 Plenum absorbers, 627
 Plenum chamber, 817
 Pneumatic control systems, 640
 Pollution of air, 545
 Polyphase motors, 670
 Ponds, 531
 Potentiometer, 817
 Power, 817
 Precipitators, 558
 Pre-cooling, 405
 Premature infant nurseries, 687
 Pressure
 absolute, 813
 atmospheric, 813
 gages, 657, 816
 measurement, 656
 barometer, 656
 regulators, 294, 766
 static, 819
 total, 819
 vapor, 820
 velocity, 820
 water supply piping, 801
 Precipitators, 558
 Prime surface, 818 (see *Heating surface*)
 Propeller fan, 565
 Properties of saturated steam, 24
 Psychrometer, 818
 Psychrometric chart, 60
 Pump, pumps
 condensation return, 273
 mechanical circulators, 312
 vacuum heating, 274
 controls, 275
 piston displacement, 276
 Pyrometer, 656, 818
 optical, 656
 radiation, 656

Q-R

Radial flow fan, 565
 Radiant drying, 782
 Radiant heating, 785, 818
 application methods, 788
 calculation principles, 790
 detailed computation method, 792
 drying methods, 733
 electric, 790
 equivalent temperature, 792
 hot water, 788, 790
 mean radiant temperature, 792
 measurement of, 797
 steam, 788
 warm air, 788
 Radiation, 818
 angle factor, 78
 equation, 76
 load, 243
 Radiator, radiators, 251, 818
 codes, 254, 255
 concealed, 253
 connections, 295
 correction factor, 255, 256
 direct, 815
 effect of paint, 256
 enclosed, 259
 gas-fired, 218
 heat emission of, 251, 253
 heating effect, 256
 heating up, 258
 output of, 256
 panel, 817
 ratings, 254
 recessed, 818
 tube, 252, 819
 types of, 251
 warm air, 218
 Railway air conditioning, 697
 air distribution, 698
 humidity control, 700
 summer systems, 699
 temperature control, 700
 ventilation, 697
 winter systems, 699
 Reciprocating compressors, 470
 Recooling, 401
 Rectangular duct equivalents, 600
 Reducing valves, 294, 766
 Reflective insulation, 93, 98, 99
 Refrigerant, refrigerants, 467, 818
 ammonia, 466
 carbon dioxide, 470
 dichlorodifluoromethane, 468
 feeds, 498
 methyl chloride, 469
 monofluorotrichloromethane, 472
 pipe sizes, 486
 water, 472
 Refrigeration, 465
 absorption systems, 476
 compression systems, 475
 control, 650
 condensers, 479 (see *Condensers*)
 equipment selection, 489
 expansion valves, 478
 ice systems, 487
 load, 164
 mechanical, 465
 reverse cycle, 491, 782
 storage systems, 489
 symbols for drawing, 830
 ton of, 819
 day of, 819
 types of compressors, 470 (see *Compressors*)
 Regain, 711
 control of, 709
 hygroscopic materials, 710
 Register, registers, 580, 586 (see *Grilles*)
 air supply noises, 631
 mechanical furnace systems, 371
 noises, 591
 railway car, 698
 selection, 360, 361, 362

Reheat, 401
 Reheating, 399
 Relative humidity, 19, 818
 measurement of, 662
 Repulsion induction motors, 669
 Residence
 control systems, 645
 air conditioning, 639, 645
 coal-fired heating plant, 645
 domestic hot water supply, 645
 cooling methods, 380
 gravity furnace system, 358
 heat loss problems, 140
 hot water heating system, 303
 humidity requirements, 379
 mechanical furnace system, 371
 steam heating system, 261
 Resistance thermometers, 656
 Resistors, 776
 Return
 grille, 590
 mains, 818
 openings, 586
 Reverse cycle refrigeration, 491, 782
 Reversed return system, 304, 818
 Roof, roofs
 heat flow through, 152
 time lag of solar radiation, 154
 ventilators, 756
 Room
 air motion, 583
 control, 649
 cross transmission, noise, 634
 latent heat, 394
 noise level, 622
 operating, 683
 sensible heat, 394
 Rotary dryer, 734
 Rotary oil burner, 212
 Run-around system, 405
 Saturated air, 9, 818
 Saturation, 818
 degree of, 19, 814
 pressure, 818
 Secondary air, 170, 182
 Sectional boiler, 237
 Self-contained
 control systems, 639
 humidifiers, 526
 unit conditioner, 429
 Sensible cooling, 405
 Sensible heat, 818
 factor, 394
 gain, 148, 164
 loss, 126
 Series wound motors, 666
 Sheet metal gages, 611
 Ship air conditioning, 704 (see *Marine*)
 heating, 835
 ventilation, 835
 Shunt wound motors, 665
 Silica gel, 447, 449
 Silicon dioxide, 447
 Single phase motors, 668
 Slotted outlets, 587
 Smoke, 818
 abatement, 550
 density measurements, 664
 Smokeless arch, 818
 Smokeless combustion, 172, 550
 Solar heat
 through shaded windows, 154
 time lag, 154
 transmission of, 148
 transmitted through glass, 153
 transmitted through walls, 148

Solar radiation
 against walls, 152
 occlusion of, 550
 Solar water heater, 810
 Soot, 183
 Sound (see *Noise*)
 absorbers, 625
 attenuation, 624, 628
 control, 620
 cross transmission between rooms, 634
 general problem, 620
 duct absorbers, 625
 levels, 621
 outlet absorbers, 628
 Space heaters, 217
 Specific
 enthalpy, 5, 818
 dry air, 5, 6
 water vapor, 8
 gravity, 818
 gaseous fuels, 184
 heat, 818
 gases, 831
 liquids, 831
 solids, 831
 vapors, 831
 volume, 1, 818
 air, 1
 water vapor, 7
 Split phase motor, 668, 669
 Split system, 818
 Splitter dampers, 375
 Spray
 booths, 725
 cooling, 445, 530
 cooling ponds, 534
 cooling towers, 535
 distribution, 525
 dryer, 746
 equipment, 521
 generation, 525
 humidifiers, 526
 type unit, 535
 unit air conditioner, 447
 Spread, air distribution, 581
 Square foot of heating surface, 818
 Squeeze dampers, 375
 Squirrel-cage induction motor, 670
 Stack, stacks, 757
 height, 818
 wall, 362
 Standard, standards, 821
 air distribution, 579
 atmosphere, 38
 State
 air conditioning, 832
 heating, 832
 ventilating, 832
 Standard air, 819
 Static
 electricity elimination, 714
 pressure, 819
 control, 642
 Steady flow energy equation, 36
 enthalpy, 38
 gravitational energy, 37
 heat and shaft work, 38
 kinetic energy, 36
 Steam, 819
 coils, 496
 distribution piping, 761
 estimating consumption, 234
 flow, 280, 281
 heated equipment, 159
 heating systems, 261, 279, 819
 air line, 265
 condensation return, 268
 corrosion, 341
 down-feed two-pipe vapor, 267
 gravity one-pipe air-vent, 262
 gravity return, 261
 gravity two-pipe air-vent, 265