

# HVAC Air / Refrigerant Diagnostic Quick Sheet



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Fixed Metering	Suction Pressure	Head Pressure	Super Heat	Subcool	Comp. Amps	ΔT
Low Charge	↓	↓	↑	↓	↓	↓
Over Charge	↑	↑	↓	↑	↑	↓
Low Indoor Airflow/Low R/R Temp	↓	↓	↓	↓	↓	↑
Dirty Condenser	↑	↑	↓	↓	↑	↓
Liquid Line Restriction*	↓	↓	↑	↑	↓	↓
Oversized Piston	↑	↓	↓	↓	↓	None
High R/R Temp	↑	↑	↑	↓	↑	↓

TXV System	Suction Pressure	Head Pressure	Super Heat	Subcool	Comp. Amps	ΔT
Liquid Line Restriction*	↓	↓	↑	↑	↓	↓
Overfeed / Loose Bulb Bulb Insulated	↑	↓	↓	↓	↓	↓
Low Charge - Slightly	None	↓	None	↓	↓	None
Over Charge - Slightly	None	↑	None	↑	↑	None
Low Indoor Airflow/Low R/R Temp	↓	↓	↓	↓	↓	↑

\*Restrictor effect on head pressure varies with the head location of the restriction. Lower pressure directly observed if located on suction. To charge a system, restrictions may allow high head side condensing, or in systems with only one condenser or an evaporator that has low percentage of surface in this position. In general, restrictions are in the liquid line and affect it in the head side upstream of the TXV.

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WB	Enthalpy
40	15.20
41	15.25
42	15.31
43	15.38
44	15.45
45	15.52
46	15.60
47	15.68
48	15.77
49	15.86
50	15.96
51	16.06
52	16.17
53	16.28
54	16.40
55	16.52
56	16.65
57	16.78
58	16.92
59	17.06
60	17.21
61	17.36
62	17.52
63	17.68
64	17.85
65	18.02
66	18.20
67	18.38
68	18.57
69	18.76
70	18.96
71	19.16
72	19.37
73	19.58
74	19.80
75	20.02
76	20.25
77	20.48
78	20.72
79	20.96
80	21.21

### Electric Heat

$$CFM = \frac{\text{Volts} \times \text{Amps} \times 3.412}{\Delta T \times 1.08}$$

### OR Furnace

$$CFM = \frac{BTU/\text{hour} \times \text{Measured} \Delta T}{\Delta T \times 1.08}$$

- 400 CFM per ton of cooling (Nominal)
- 12,000 BTU per ton of cooling
- BTU sensible Output = CFM x TD x 1.08
- 1 Watt = 3.412 BTU/h
- 1 Kilowatt = 3,412 BTU/h
- 746 Watts = 1 Horsepower

### Checking a Gas Meter

$$\text{Input} = \frac{3600 \times \text{Smallest dial size}}{\text{Ccu Ft} \times \# \text{ of seconds for one revolution}}$$

### Testing Capacitors Under Load

$$\frac{2652 \times (\text{steps of the meter winding})}{1} \text{ (Volts across the capacitor)}$$

- Total Heat = (R1 - R2) x 4.5 x CFM
- R1 = Return air wet bulb (converted to enthalpy)
- R2 = Supply air wet bulb (converted to enthalpy)

### Estimated Evaporator TD

- AC at 400 CFM/Ton = 20°
- Refrigeration Walk in 10°
- Refrigeration Reach in 20°

### Gas Appliance Draft Pressure

Natural Gas 5.5" w.c. / LP = 0.75" w.c.

### CTDA

- Estimated Condensing Temp Over Ambient
- 6-9 SEER = 30°
- 10-12 SEER = 20°
- 13-15 SEER = 20°
- 16+ SEER = 10°

# Hvac Troubleshooting Chart

**Robert Rosaler**



## **Hvac Troubleshooting Chart:**

**HVAC Troubleshooting Guide** Rex Miller,2009-02-10 A Practical On the Job HVAC Guide Applicable to residential commercial and industrial jobs this essential handbook puts a wealth of real world information at your fingertips HVAC Troubleshooting Guide shows you how to read interpret and prepare schedules mechanical plans and electrical schematics This handy resource will aid you in your everyday tasks and keep you up to date with the latest facts figures and devices The book includes numerous illustrations tables and charts troubleshooting tips safety precautions resource directories and a glossary of terms HVAC Troubleshooting Guide helps you Identify and safely use tools and equipment both new and old Use heat pumps and hot air furnaces Calculate ventilation requirements Work with refrigeration equipment and the new refrigerants Utilize control devices including solenoids and relays Operate select and repair electric motors Work with condensers compressors and evaporators Monitor the flow of refrigerant with valves tubing and filters Comply with the Section 608 refrigerant recycling rule Program thermostats Insulate with batts sheet tubing covers and foam Work with solid state controls Understand electrical and electronic symbols used in schematics [Audel HVAC Fundamentals, Volume 1](#)

James E. Brumbaugh,2012-07-02 A reference you ll warm up to From the background and basics of heating systems to the newest chip based technology this first volume of Audel s HVAC Library gives you comprehensive information you need on the job Whether you re installing servicing repairing or troubleshooting an old or new heating system you ll find what you re looking for from wood and coal furnace maintenance to new calculations and the latest environmental technologies and regulations Review the basics of installation wiring and troubleshooting for different HVAC systems Choose the correct system for the space climate and needs Compare the economy and efficiency of various fuel types Install maintain and troubleshoot conversion units Find formula cross references data tables with conversions and listings of trade organizations and equipment manufacturers **Air conditioning and Refrigeration Repair Made Easy** Hooman Gohari,2009-10-19 This comprehensive book has been developed to quickly train an average person for the vast commercial and residential refrigeration and air conditioning market within a short period of time It provides all the technical knowledge needed to start a successful refrigeration and air conditioning business anywhere in the world [HVAC Licensing Study Guide, Third Edition](#)

Rex Miller,Mark R. Miller,2018-01-24 Publisher s Note Products purchased from Third Party sellers are not guaranteed by the publisher for quality authenticity or access to any online entitlements included with the product Ace the Major HVAC Licensing Exams Featuring more than 800 accurate practice questions and answers HVAC Licensing Study Guide Third Edition provides everything you need to prepare for and pass the major HVAC licensing exams This highly effective career building study resource is filled with essential calculations troubleshooting tips for the job site hundreds of detailed illustrations and information on the latest codes and standards You will get brand new coverage of troubleshooting for small motors and electrical equipment for HVAC This thoroughly revised study guide helps you Master the material most

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**McGraw-Hill's HVAC Licensing Study Guide** Rex Miller,Mark Miller,2007-01-11 Get All the Practice Questions and Answers Calculations and Troubleshooting Tips You Need to Ace the major HVAC Licensing Exams HVAC technicians and students alike can turn to the HVAC Licensing Study Guide for everything they need to prepare for and pass the major HVAC licensing exams on the very first try Designed to boost confidence skills and knowledge this unique career building resource contains over 800 practice questions and answers essential calculations and step by step troubleshooting tips for the job site Written by two of the most experienced and successful authors in the HVAC field this on target book presents a wealth of current information on heating boilers ventilation ductwork air conditioning systems and methods refrigeration electrical systems control devices materials and equipment design and codes and standards Filled with over 200 detailed illustrations and handy tip boxes on important code matters and exam questions the HVAC Licensing Study Guide enables readers to Develop skills with material most likely to appear on the NATE ICE RSES and HVAC licensing exams Improve test taking ability with over 800 exam style multiple choice and true false questions and answers Learn about the latest refrigerant usage and regulations Keep up with the most recent codes and standards Acquire the confidence skills and knowledge needed to pass your licensing exam on the first try This HVAC Study Guide Will Help You Master Heating Boilers Ventilation Ductwork Air Conditioning Refrigeration Electrical Control Devices and Much More

*The Complete Guide to HVAC Troubleshooting: A Homeowners Manual* Tim David,2023-12-29 The Complete Guide to HVAC Troubleshooting is a definitive resource for homeowners and aspiring technicians alike offering in depth insights and practical advice on diagnosing and resolving a wide range of heating ventilation and air conditioning issues This book serves as an indispensable tool for anyone looking to understand maintain and repair their HVAC systems efficiently and effectively Structured to cater to both beginners and those with more technical experience the guide begins by introducing the fundamentals of HVAC systems It outlines the core components how they operate and the common types of HVAC systems found in homes and buildings This foundational knowledge sets the stage for more complex topics ensuring all readers are up to speed Central to the book is a comprehensive troubleshooting section detailing step by step methods to diagnose common and not so common problems From strange noises and inconsistent temperatures to complete system failures the guide provides clear concise instructions to identify issues and implement

solutions It covers a range of scenarios including quick fixes that can be handled without professional help and more complex problems requiring expert intervention The guide goes beyond simple fixes delving into the nitty gritty of HVAC maintenance performance optimization and longevity It discusses preventive measures routine maintenance schedules and the signs that indicate a need for repair or replacement Additionally the book offers valuable tips on selecting the right tools safety precautions and understanding when to call in a professional With *The Complete Guide to HVAC Troubleshooting* readers will gain the confidence to tackle various HVAC issues head on ensuring their systems run smoothly and efficiently all year round This book is more than just a troubleshooting manual it s a comprehensive reference for anyone committed to understanding and caring for their HVAC system Get ready to turn the page and take control of your home s comfort and air quality

*HVAC Licensing Study Guide, Second Edition* Rex Miller, Mark R. Miller, 2012-10-04 This fully updated study guide helps readers pass the HVAC licensing exam and serves as an on the job reference after the exam

*Fundamentals of Automotive Technology* Vangelder, 2017-02-24 Revised edition of *Fundamentals of automotive maintenance and light repair* Kirk T VanGelder 2015

*Network Maintenance and Troubleshooting Guide* Neal Allen, 1997

*HVAC Instant Answers* Peter Curtiss, Newton Breth, 2002 The book will be published in a flexible 5 x 8 format filled with schematic system layouts and graphics showing how commonly measured data can be used to identify operating problems with the HVAC equipment It is expected that about one quarter to one third of the book will be line drawing system schematics graphics showing expected data in fault and no fault states and a few photographs of systems used only when such a figure is required for clarifying points made in the text

***Fundamentals of Automotive Technology*** Kirk VanGelder, Kirk T. VanGelder, 2022-02-23 *Fundamentals of Automotive Technology Principles and Practice Third Edition* is a comprehensive resource that provides students with the necessary knowledge and skills to successfully master these tasks

*National Plumbing & HVAC Estimator*, 2000

*Chilton's I & C S*, 1992

***HVAC Maintenance and Operations Handbook*** Robert C. Rosaler, 1998 Part I Introduction Glossary of HVAC Terms The HVAC Design Factor Building Design and Equipment Location Part II Commissioning Introduction to Commissioning The Commissioning Process The Commissioning Specification Commissioning Check Lists Commissioning Computer Based Control Systems Part III Management of Maintenance and Repair Strategic Planning Preventive Predictive Proactive Maintenance Maintenance In House versus Outsourcing Computerized Maintenance Reliability Centered Maintenance Stores and Parts Management Part IV Maintenance and Repair Technology Piping and Ductwork Air Moving Equipment Pumps and Valves Heating Equipment Cooling Equipment Air Distribution System Control Equipment Condensate Control

*Air Conditioning and Refrigeration Troubleshooting Handbook* Billy C. Langley, 1980 A complete practical overview of the servicing and troubleshooting of cooling equipment Provides detailed explanations of the purpose of each cooling system component Covers the common problems encountered during troubleshooting Troubleshooting charts provide readers with practical information and are a handy reference

Numerous wiring diagrams illustrate the book Suggested procedures for repairs are listed

**Residential Electrical Design** John E. Traister, 1994 Here you will find everything you need to know about blueprints what the NEC requires how to size electric service calculate and size loads and conductors install ground fault circuit interrupters ground service entrances and recommended wiring methods It covers branch circuit layout how to analyze existing lighting layouts and install outdoor lighting methods for remote control switching residential HVAC systems and controls and more

*Contractor's Guide to QuickBooks Pro 2002* Karen Mitchell, Craig Savage, Jim Erwin, 2002 According to a recent national survey more construction contractors use QuickBooks Pro and QuickBooks than all other accounting programs combined And for good reason QuickBooks Pro excels at all the routine paperwork in a construction office writing checks keeping track of your bank balance sending out invoices and statements creating up to the minute profit and loss statements for the month year or by job writing payroll checks paying suppliers and subcontractors tracking job costs comparing estimated and actual costs for each job and much more But there is a lot to learn in QuickBooks Pro And converting to a new accounting system can be a complex and confusing task even if you have a strong background in accounting and plenty of time to install the new system That is why this book was written because most construction pros are not accounting experts and have more important work to do at the job site

*Electricity for HVAC and R* ESCO Institute Staff, Richard Jazwin, 2000

**Troubleshooting and Servicing Air Conditioning Equipment** S. Don Swenson, 1985

**HVAC Handbook** Robert Rosaler, 2004-07-27 This comprehensive handbook provides instant access to all the data calculations and equations needed for modern HVAC design Detailing up to the minute design methods operation and maintenance procedures and energy conservation and efficiency tools this essential reference provides a single volume solution to a myriad of HVAC design needs Includes both SI and metric units Controls and control systems Maintenance troubleshooting and repair Indoor air quality control

## **Hvac Troubleshooting Chart** Book Review: Unveiling the Magic of Language

In an electronic digital era where connections and knowledge reign supreme, the enchanting power of language has become more apparent than ever. Its capability to stir emotions, provoke thought, and instigate transformation is really remarkable. This extraordinary book, aptly titled "**Hvac Troubleshooting Chart**," written by a very acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound impact on our existence. Throughout this critique, we shall delve into the book's central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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