

## GEOFF ALDER -- MAGAZINE ARTICLES COLLECTION (SECOND EDITION)







### AIR CONDITIONING BASICS (LARGELY FOR BEGINNERS)

AIR Conditioning in a Nutshell - Part 1.	The refrigeration cycle.
AIR Conditioning in a Nutshell - Part 2.	Split and ducted air conditioning systems
AIR Conditioning in a Nutshell - Part 3.	Centralised air conditioning systems.

### AIR HANDLING ISSUES

Kitchen Extract Insights	A conversation with Trevor Pengelly.
Stairwell Pressurisation	Attempting to rationalise operation in terms of the National Building Regs.
Room Air Distribution.	An analysis of airside performance in differing room types.
Fan Selection - Static or Total Pressure?	Clearing up this area of severe misunderstanding.
Fans and the System effect Factor	An important issue, so little understood!
Variable Air Volume Systems, Parts 1 and 2.	A range of thought on VAV
Variable Air Volume Systems, Part 3	A range of thought on VAV
Variable Air Volume Systems Part 4	A range of thought on VAV
Variable Air Volume Systems Part 5	A range of thought on VAV
Gymnastics With Home Air Conditioning	How one installer got it hopelessly wrong.
Household A/c Designs That DO Work.	Getting the airside design right.
The "Measure-on-Site" Escape Route.	A Draughtsman's dodge that leads to fan non-performance.

### AIR SIDE

 Part 1 – Airflow Fundamentals.
 Part 2 – The Pressures Involved.
 Part 3 – Velocity Pressure, and Duct Pressure Measurements.
 Part 4 – The Regain of Static Pressure.
 Part 5 – The Habits of Flowing Air.
 Part 6 – Accommodating Directionality in Air Flow.

### CONTROL CONSIDERATIONS

Humidity Control Logic.	Strange twists, affecting humidity control under dehumidification application.
Sorting Out Basic Electronic Controls.	If a replacement is not readily available, many faults are repairable.
Entering Water Control for Recips.	Issues which are widely misunderstood, and are very costly.
Leaving Water Control for Recips.	The other side of the control coin. The only way this can work.











### COOLING LOAD AND THE BUILDING

Glass and Air Conditioning.	How excessive glazing can trash air conditioning performance.
Wading Through the U-Factor Soup.	Making logic of what, to many is, "the illogical".

### ELECTRICAL

Electrical Series Part 1	Some electrical fundamentals.
Electrical Series Part 2	Magnetic fields and transformers.
Electrical Series Part 3	Waveform, and inductive issues.
Electrical Series Part 4	A three-phase supply.
Electrical Series Part 5	The stator of a 3-phase motor.
Electrical Series Part 6	The rotor of a 3-phase motor.
Electrical Series Part 7	Motor operating speed, and star-delta starting.
Electrical Series Part 8	Capacitor issues.
Electrical Series Part 9	Single phase motor operation.
Electrical Series Part 10	Voltage and current relays on 1-ph motors.
Electrical Series Part 11	Starting forms of 1-ph compressor motors.
Electrical Series Part 12	Capacitor checks, and connection issues.
Electrical Series Part 13	Motor checks re 1-ph motor-compressors
Electrical Series Part 14	Connection between bad power and compressor failures.
Electrical Series Part 15	Electricity metering and cost-cutting steps.
Electrical Series Part 16	Understanding power factor and its correction.
Electrical Failures in Hermetic Compressors.	A study from the electrical perspective.

## PRESSURE-ENTHALPY DIAGRAM



-  Part 1– Basic Layout
-  Part 2– More on the Layout
-  Part 3 – A Range of Conditions.
-  Part 4 – Evaporating and Condensing.
-  Part 5 – The Compressor.
-  Part 6 – The Expansion Process.
-  Part 7 – Applying Thermostatic Expansion Valves.
-  Part 8 – Transcritical Refrigeration.
-  Part 9 – Liquid Feed Control and Condensing Pressure.
-  Part 10 – Heat Pump Application.

## PROCESS WORK

- Biltong Story Part 1
- Biltong Story Part 2
- Biltong Story Part 3
- Biltong Story Part 4
- Biltong Story Part 5
- Biltong Story Part 6

Moisture removal issues; Psychrometrics  
Vapour pressure; Aspects of psychrometrics  
Vapour pressure issues. Dalton's Law  
Drying parameters; Aspects of psychrometrics  
Interrelationship between airflow and refrig system evaporating pressure.  
Hot gas reheat; Refrigeration.

## PSYCHROMETRICS -- THEIR APPLICATION

- Zones of Air Conditioned Comfort
- Psychrometrics and Real Life
- Psychrometrics and Psy. Processes - Part 1.
- Psychrometrics and Psy. Processes - Part 2.
- Psychrometrics and Psy. Processes - Part 3.
- Psychrometrics and Psy. Processes - Part 4.
- Psychrometrics and Psy. Processes - Part 5.
- Psychrometrics and Psy. Processes - Part 6.
- Psychrometrics and Psy. Processes - Part 7.
- Psychrometrics and Psy. Processes - Part 8.
- Psychrometrics and Psy. Processes - Part 9.
- Psychrometrics and Psy. Processes - Part 10.
-  Part 11 – Preheat and Reheat
-  Part 12 – Succeeding With Humidification



Why some erstwhile advertising misinformed.  
Psychrometric twists the designers often don't adequately evaluate.  
Background information on the psychrometric chart.  
Dry air, which contains moisture! Dalton's Law.  
Relative humidity is superheated steam!  
Discerning between specific and relative humidity.  
The strange habits of water vapour.  
Close examination of the airside process through a cooling coil.  
Performance considerations of a cooling coil.  
Sensible and latent cooling effect, applied to a room.  
Evaporative cooling based air conditioning for textile applications.  
Supersaturated processes.

## PUMPED WATER SYSTEMS







- Pumped Water Systems.
- Pumps, Parallel and Series

Covered are many issues, such as the significance of 'pressure' and 'head'.  
Removing the mystery from pump connection arrangements.



## REFRIGERATION

- Thermostatic and Automatic Expansion Valves. Distinguishing between these two entirely different types.  
DX Refrigeration and All Outside Air Handled improperly, this leads to refrigeration disaster!  
Recognising the Refrigerant Tides Refrigerant 'comes and goes' in the system. Must be accommodated.  
Capillary Tubes and Conflicting Symptoms Clarifying the differences between TX valve and restrictor feed.  
Reading System Temperatures Some 'tricks of the trade' regarding superheat temperature evaluations.  
Suction Superheat and Glide Refrigerant mixtures and superheat adjustment.  
Tracing a Coil Circuit. Coil operation analysis--making sense of nonsense.  
Are You Being Sidelined by Capillary Tubes? More thought on restrictor-type liquid feed control systems.  
Condenser Failure Evidence of "finger trouble".  
The Low Suction Cure-All Poor answers to providing capacity control.  
Compressor Failures - Liquid Slugging Exactly how liquid wrecks a recip. compressor.  
Compressor Failures - The Saga Continues. Refrigerant migration.  
The Lubrication Story - Part 1 Good oil films, and bad oil.  
The Lubrication Story - Part 2 Causes of Oil Pressure Reduction.  
The Lubrication Story - Part 3 Copper plating, and what it does.  
The Heat Pump Perspective Heat pumps, R-22 and superheat.  
TX Valve Operation - The Superheat Story. Superheat, and valve operation.  
TX Valve Operation - Part 2 A closer look at operating intent.  
TX Valve Operation - Part 3 Interpreting coil circuits, and preparing temperature scans.  
TX Valve Operation - Part 4 Investigating valve hunting.  
TX Valve Operation - Part 5 TX valve sizing considerations, and load split.  
Condensing, and the Liquid Seal. Keeping vapour out of the liquid line.  
Liquid receivers. Are these the most misunderstood part of refrigeration?  
Flow-through vs Surge Receivers. A comparison between two approaches.  
Failures in Welded Hermetic Compressors. How to objectively analyse compressor failures.  
Scroll Refrigeration Compressors - Part 1. Basics of scroll compressor function.  
Scroll Refrigeration Compressors - Part 2. Deeper considerations of scroll compressor function.  
CO2 Refrigeration - Part 1. Transcritical refrigeration with carbon dioxide  
CO2 Refrigeration - Part 2. An economiser cycle on carbon dioxide refrigeration.  
 The issue of oil return in a refrigeration system.  
 Responsible Use of Nitrogen-Setting Up an Oil Pressure Switch.

## SPECIALISED APPLICATIONS

-  An Exploding Compressor-And a Near-Tragedy. "Finger Trouble" and a Lack of "Know-How".  
 Low Temperature-Low rh Rooms. A Difficult Combination in a Humid Region.  
 Eskom and Air Conditioning Part 1. Power Factor.  
 Eskom and Air Conditioning Part 2. Understanding the p-h Diagram.  
 Eskom and Air Conditioning Part 3. The p-h Diagram and the Refrigeration System.  
 Eskom and Air Conditioning Part 4. A/C Installation Shortcomings.

## STEAM ISSUES

-  Combating Leaks in Steam Heating Coils.  
 Steam Coils, and Resolving the Condensate Dilemma.

## WATER TREATMENT ASPECTS

(See also "Condenser" issues under "Refrigeration").

- Water Treatment - Success Without Chemicals A case study of non-chemical scale-limiting devices.  
Don't Destroy That Condenser! Condenser cleaning issues.