DATA AIRE INC.

DATA TEMP

AND

MODULAR DATA TEMP

Operation and Maintenance Manual

Air and Water/Glycol Cooled

CONGRATULATIONS ON THE SELECTION OF A DATA AIRE PRECISION ENVIRONMENTAL CONTROL SYSTEM. PROPER INSTALLATION, OPERATION AND MAINTENANCE OF THIS EQUIPMENT WILL ENSURE YEARS OF OPTIMAL PERFORMANCE.

This manual is intended to assist trained service personnel by providing necessary guidelines for this particular equipment. Service to Data Aire units should be done by qualified individuals with an adequate background in areas such as HVAC, electrical, plumbing and electronics, as applicable.

Service performed by unauthorized or unqualified technicians may void manufacturers' warranties and could result in property damage and/or personal injury.

Special care should be given to those area where these symbols appear.

Data Aire, Inc. reserves the right to make design changes for the purposes of product improvement, or to withdraw any design without notice.

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1.0 INSTALLATION

There is no intent on the part of Data Aire, Inc. to define local codes or statutes which may supercede common trade practices. The manufacturer assumes no responsibility for their interpretation. Consult local building codes and the National Electrical Code for special installation requirements.

1.1 Room Considerations

Precision air conditioning equipment is designed to control spaces within close tolerances of temperature and humidity. However, the room must be built with a proper vapor barrier. A film of polyethylene is often used on walls and ceilings. Walls and floors must also be painted with a vapor-seal paint. Failure to provide a vapor barrier can compromise space conditions.

Introduction of outside air into the space should be minimized. Outside air in excess of 5% of the total circulated air volume can have a significant effect on the overall space conditions and result in poor space control.

1.2 Inspection

This Data Aire unit has been factory run-tested and has gone through a comprehensive inspection prior to its packaging and shipment to ensure that it arrives in excellent condition. However, shipping damage can occur and a visual inspection of the outer crating immediately upon delivery should be performed.

Note any external damage or other transportation damage on the freight carrier's forms. Inspect the unit itself for internal damage. A claim should be filed with the shipping company if the equipment is damaged or incomplete.

Loose items such as remote control panels, disconnect switch handles, spare belts and spare filters are packed inside the unit. Refer to the yellow shipping tag located on the unit door for details.

Freight damage claims are the responsibility of the purchaser. Action to recover losses should be filed immediately. Please notify factory personnel of any claims.

1.3 Rigging

Move the unit in its upright position to the installation site. It is recommended that the unit be protected from damage to the decorative doors during any storage or moving. Removal of the decorative doors is easily accomplished and may be done when moving equipment.

The shipping skid should be left in place if the unit is being moved with a forklift. If the unit is being lifted, use spreader bars to prevent damage to the doors and panels.

The unit has 3/4" holes in the shipping skid to which casters with 3/4" stems can be attached. This allows easy movement down halls, into elevators and through doorways. If clearance is a

problem the casters may be inserted directly into the bottom of the 1" tubular steel corner posts at the bottom of the unit.

Warning: Improper lifting or moving of equipment may result in damage to decorative doors, panels or frame members.

1.4 Locating the Unit

When installing the unit, sufficient space must be allowed for airflow clearance, wiring, plumbing, and service access. It is recommended that each side and front have a clearance of at least 30" to allow the doors to swing open and for servicing the unit.

The doors on some sides may not require as much service clearance. Refer to the particular unit component breakdown drawings for assistance. Rear clearance is not required, but 1" to 2" of clearance is suggested.

For the best air distribution, the unit should be centered against the longest wall, as close to the heat load as possible, unless the unit is ducted. The unit should not be placed near any corner of the room or at the end of a long, narrow room. Multiple units should be evenly spaced, as far apart as possible.

Note to Installing Contractor: Condensation formation and frequent humidifier flushing are normal functions of this equipment. Proper drain connections must be made to ensure proper removal. Unit will require water connections for condensate removal and possibly for humidifier makeup water, condenser water, chilled water and/or hot water. Installation of units above equipment that could sustain water damage should be avoided.

1.4.1 Downflow Units

Downflow units will typically sit on an elevated flooring system known as a raised floor. The unit discharges air downward which pressurizes the raised floor and channels upward through perforated floor tiles. Location and quantity of perforated tiles will dictate proper air distribution. If the raised floor is strong enough to support the unit and local codes permit, the unit can be placed directly on top with cutouts made for the discharge openings.

There may be additional support required in the form of adjustable jackstands. These are adjustable, threaded leveling rods which support the unit in each of the corners and in the center on longer length units. Tighten the locknuts provided with each jackstand. The baseplate can rest on the floor or on vibration isolation pads.

Floorstands are also a way of supporting the unit. These are ordered to the height of the floor with leveling rods to allow adjustment. The floorstand has lips in each corner to align with the unit which is placed on top. It is recommended that the unit frame be bolted or screwed to the floorstand from below. Local building codes may dictate this procedure. After installation, the raised floor is typically built around the unit.

The raised floor serves as the distribution plenum for air on downflow units. Cables, piping, wiring raceways, inadequate floor height and any other restrictions can inhibit proper airflow. Care should be taken to avoid restrictions.

1.4.2 Upflow Units

Upflow units will typically be supported by vibration isolation pads and/or floorstands which and may also include leveling screws. An air discharge plenum may be factory provided which ships loose and must be attached at the top of the unit frame.

Alternately, an air distribution plenum must be field fabricated with supply grilles to distribute the air. Units are shipped with a drive package to overcome external static pressure. Adjustments to the blower speed may be required to adjust to actual conditions.

1.5 Paperwork

Each Data Aire unit ships with a start-up sheet that should be completed during installation. Also included in the paperwork is a warranty/information packet that provides important wiring diagrams, specific component literature, warranty registrations cards and other valuable paperwork, including a copy of this Installation/Operation and Maintenance manual.

A yellow tag is attached to the outside decorative door to indicate articles that may have been packaged and shipped loose within the unit cabinet. Typically this would be jackstands, condensate pumps and other loose components that are not factory mounted.

1.6 Storage

Your Data Aire equipment comes ready for immediate installation. In some instances in may be necessary to store the equipment for a period of time. If you must store the equipment it should be done in a dry area, out of the weather, protected from damage by other equipment in storage or transportation equipment, never stacked, and avoid frequent relocation.

If equipment is stored for longer than 30 days special precautions must be taken to avoid coil damage. All coils should be charged and sealed with a low pressure (1-3 psig) inert gas, such as nitrogen. This prevents contaminates from entering the coils; then when the seal is broken at installation, the rush of escaping gas verifies the coil is still leak free. If coils are not charged and sealed condensation mixes with air pollutants forming a weak acid and over time can cause pin hole leaks to develop in the coil tubes.

When equipment is installed after storage caution should be taken to inspect and replace, if required, rubber hoses and belts. All moving parts, such as blowers and motors, should be hand tested to ensure that they are free and clear prior to start-up. Finally, verify that all lubrication is fresh and full.

It is the responsibility of the installing contractor to return the start-up sheet and warranty registration card to Data Aire for proper activation of the unit warranty. Failure to do so may cause delays and in some cases void the warranty.

2.0 PIPING

2.1 Air Cooled Unit Piping

Refer to the attached line sizing chart on page 30 for a guideline for sizing refrigerant lines. The ultimate responsibility for line size selection is that of the installing contractor or project engineer. Data Aire does not assume this responsibility. The chart covers distances up to 200 equivalent feet. For installations beyond this distance, consult ASHRAE or similar references.

Standard piping practice must be used to ensure proper oil return and efficient operation. The interconnecting lines to the remote air cooled condenser must be installed by a qualified refrigeration mechanic.

2.1.1 Discharge Lines

Discharge lines, also called hot gas lines, should be trapped at the top (inverted) and bottom, as well as every 20 feet of vertical rise. Discharge line check valves are recommended on all installations, especially those where there are long pipe runs or cold climate. Check valves should be installed six feet from the compressor.

Discharge line pressure drop should not exceed 6 PSI. Recommended gas velocity for proper oil return is 1,000 FPM. Slope horizontal lines downward in the direction of refrigerant flow 1/2" for every ten feet of line length.

2.1.2 Liquid Lines

Liquid line size is determined by pressure drop and velocity. The liquid line pressure drop should be not exceed 5 PSI. The recommended velocity should be between 200 and 300 fpm.

To avoid excessive liquid line pressure drop, the air cooled condenser should be located above or at the same level as the evaporator. Condenser installation more than ten feet below the evaporator should be avoided.

2.1.3 Suction Lines

Typical floor mounted units are built with compressor in the indoor evaporator section. Some applications call for the compressor to be mounted in the outdoor condenser, or condensing unit. Such cases require field piping of liquid and suction lines. Suction lines are trapped similarly to discharge lines. Common practice for suction line selection and installation should be followed.

2.1.4 Connection Sizes, Air Cooled Units

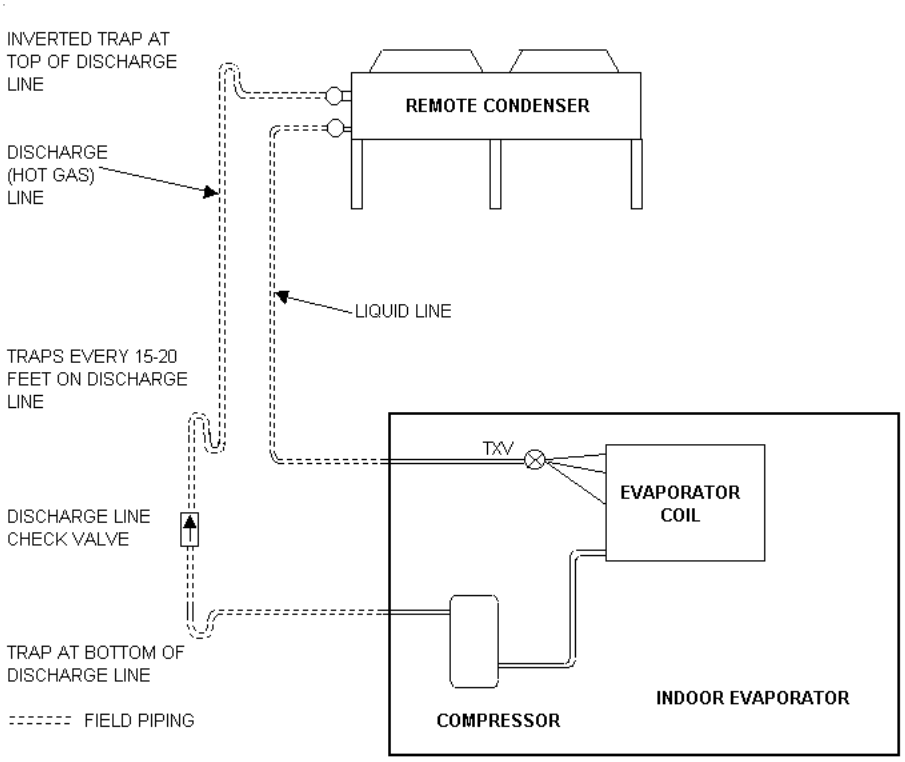
Model	Hot Gas	Liquid
DTA* 02	1/2"	1/2"
DTA* 03	1/2"	1/2"
DTA* 04	1/2"	1/2"
DTA* 05	1/2"	1/2"

Model	Hot Gas	Liquid
DTA 08	3/4"	5/8"
DTA 10	3/4"	5/8"
DTA 13	3/4"	5/8"

* D - downflow, U - upflow

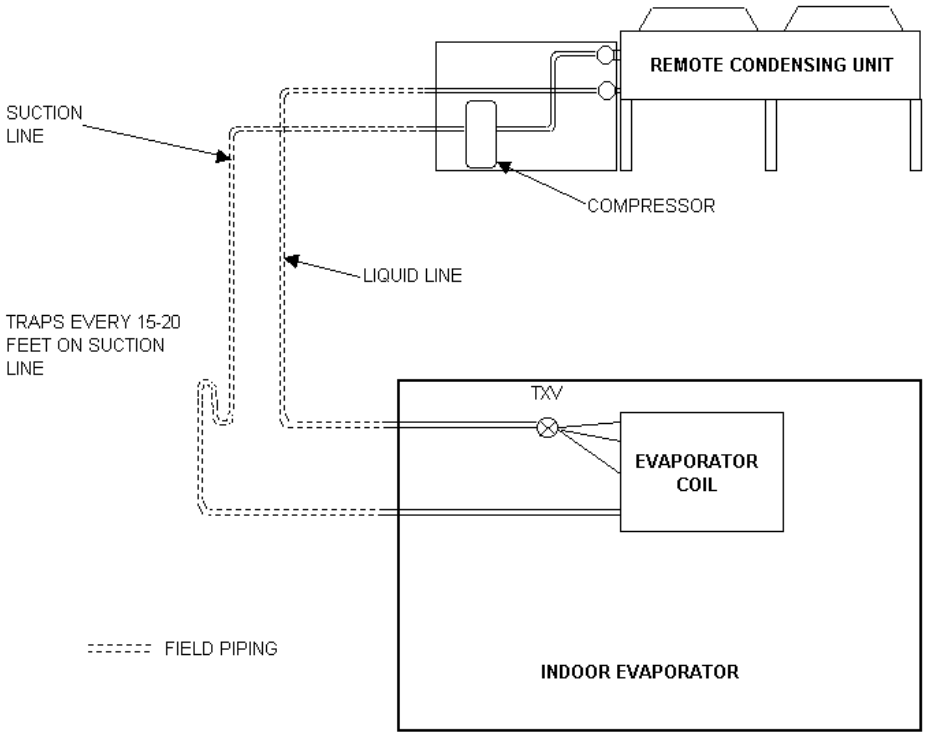
Field connections at the indoor evaporator and remote condenser or condensing unit will not necessarily be the same as the field pipe size required. In some cases these will vary significantly.

2.1.5 Field Piping, Remote Condenser



One Circuit Shown

2.1.6 Field Piping, Remote Condensing Unit



One Circuit Shown

2.2 Water/Glycol Cooled Unit Piping

The required field installed condenser water pipe sizes may or may not be the same as the connection sizes at the evaporator or fluid cooler. This will depend on the length of pipe and the calculated pressure drop of peripheral components.

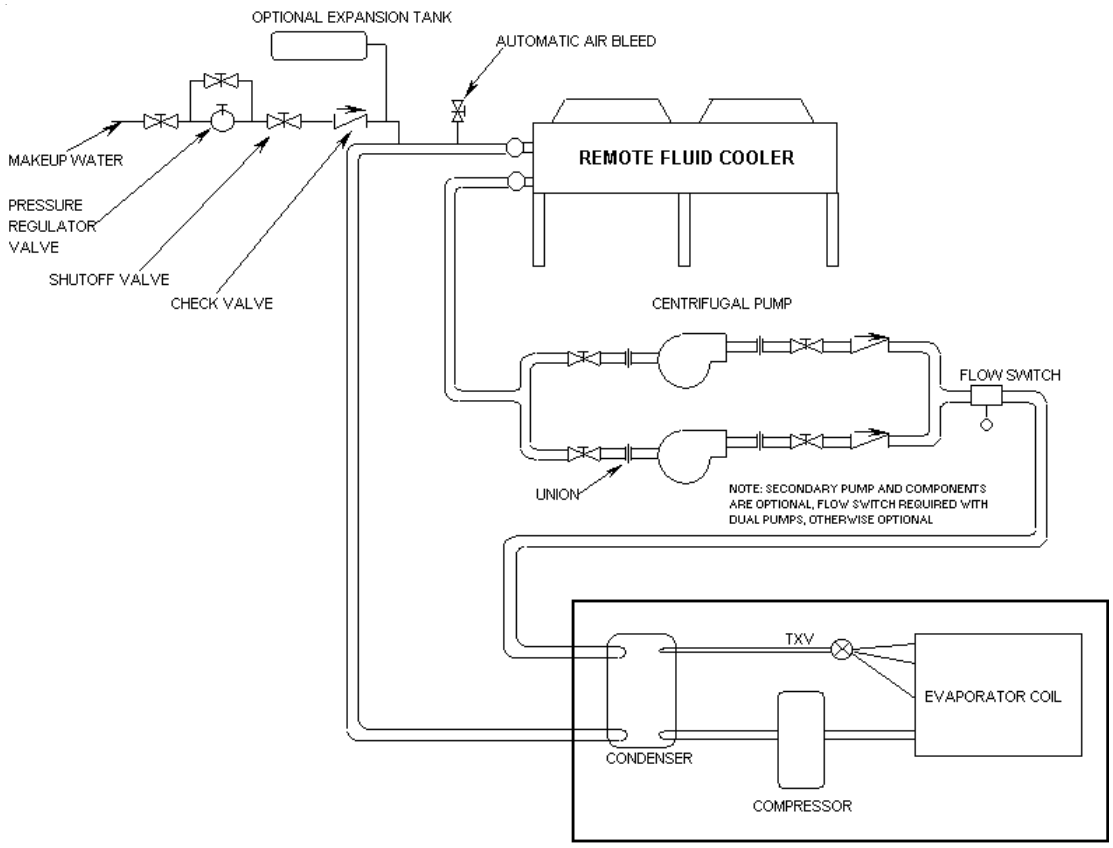
Water cooled units may also be connected to building water or tower water sources. Pipe size will depend on length of run and the maximum water flow required.

Shutoff valves should be installed within a few feet of the inlet and outlet connections of the evaporator to allow the unit to be isolated for service. A fill valve with a hose bib connection should also be used on the supply line or return line at the unit to allow the unit to be drained.

Units with plate fin condensers have a factory mounted strainer. For units without strainers , one should be field installed on the inlet water pipe. Strainers must be cleaned periodically.

> ⚠ One of the most common problems in a water/glycol system is the presence of air in the condenser water loop. Air vents must be installed in various locations in the piping system to purge the air.

2.2.1 Field Piping, Glycol System



2.2.2 Connection Sizes, Water/Glycol Cooled Units

Evaporator Model	Water IN and OUT Connections, OD	Evaporator Model	Water IN and OUT Connections, OD
DTW/G 02	3/4"	DTW/G 08	1-5/8"
DTW/G 03	3/4"	DTW/G 10	1-5/8"
DTW/G 04	1-1/8"	DTW/G 13	1-5/8"
DTW/G 05	1-1/8"		

2.2.3 Connection Sizes, Fluid Coolers

Fluid Cooler Model	Water IN and OUT Connections, OD	Fluid Cooler Model	Water IN and OUT Connections, OD
DAFC 06	1-5/8"	DAFC 37	2-5/8"
DAFC 07	1-5/8"	DAFC 40	2-5/8"
DAFC 09	1-5/8"	DAFC 44	2-1/8"
DAFC 11	2-1/8"	DAFC 50	2-5/8"
DAFC 15	2-1/8"	DAFC 57	2-5/8"
DAFC 17	2-5/8"	DAFC 61	2-5/8"
DAFC 21	2-1/8"	DAFC 75	2-5/8"
DAFC 24	2-5/8"	DAFC 80	2-5/8"
DAFC 28	2-5/8"	DAFC 88	2-5/8"
DAFC 30	2-1/8"	DAFC 100	2-5/8"

Models DAFC 57 and larger are double-wide units. Although the header connection for each section is 2-5/8", each unit comes with a factory provided manifold kit with 3-1/8" field connections.

2.3 Auxiliary Chilled Water Coil Piping

Units with an Auxiliary Chilled Water cooling coil require a separate source of chilled water. These chilled water connection sizes will be equal to the condenser water connection sizes on the chart in Section 2.2.2. Units with an Energy Saver cooling coil have shared piping with the condenser supply and therefore do not require a separate water source.

2.4 Condensate Drain Piping

Every indoor unit has a 3/4" copper stub provided for condensate removal. A union is recommended at the field connection which will permit easy disconnection from the unit for cleaning.

A trap should be built into the drain line to prevent air from backing up into the unit. Drain lines should be pitched downward not less than 1/4" for each ten feet of horizontal run. Do not reduce the size of the drain line.

Some applications have no convenient means of allowing a gravity drain. In this case, a condensate pump can be used. These come either factory mounted or shipped loose. Factory mounted condensate pumps do not require a separate power source.

Condensate pumps shipped loose (or field provided) typically require a dedicated 110 volt power source. Field pipe connections must be made to the pump discharge connection. A check valve must be installed to prevent short cycling. See also condensate pump electrical requirements in Section 3.9.

2.5 Humidifier Piping

2.5.1 Steam Generator Humidifier

The standard humidifier on *Data Temp* or *Modular Data Temp* systems is a steam generator type with a disposable cylinder. The humidifier makeup water should be brought to the humidifier through the field connection opening using 1/4" copper tubing. A compression fitting is provided at the humidifier.

A shutoff valve should be provided outside the air conditioner to allow disconnection for service. An in-line water pressure regulator and strainer should be installed. Water pressure should be set between 20 and 50 PSI.

The humidifier has a drain at the bottom which is factory piped to the main condensate drain line. The dispersion tube also has a drain line. No additional field piping is required.

2.5.2 Dry Steam Humidifier

The optional dry steam type humidifier requires a strainer on the inlet steam line. An outlet connection with a field-provided steam trap is also required. Steam pressure is typically 10-15 psi.

2.6 Leak Testing

No installation is complete until the entire system has been thoroughly checked for leaks. This includes checking refrigerant tubing, flare fittings, pressure controls, Shrader fittings and compressor rota-lock service valves.

In addition to the refrigeration system, check all condenser water lines, humidifier makeup lines, condensate lines, condensate pumps, chilled water lines, centrifugal pumps, and fluid coolers as applicable.

With recent changes in the handling and recovery of refrigerant, it is not permissible to release refrigerant into the atmosphere. Many leak-test methods recommended in the past are no longer possible. Current standard practices must be used.

One acceptable method of leak testing air cooled systems does not involve the use of refrigerant. Prior to charging, pressurize the system to 150 psi with dry nitrogen with all refrigerant valves open. Place a gauge on the line and allow at least four hours before observing if the pressure reading has changed.

Tightening of fittings and valves is the responsibility of the installing contractor.

3.0 ELECTRICAL CONNECTIONS

Before proceeding with the electrical connections, make certain that the volts, hertz, and phase correspond to that specified on the unit electrical nameplate. Use copper conductors only.

3.1 Electrical Service

Check to be sure the service provided by the utility is sufficient to handle the additional load imposed by this equipment. Most units with secondary heat exchangers will require a separate power source and field-provided, interconnecting control wires. See section 3.5 below.

Remote condensers will typically require one power source. Glycol systems with fluid coolers and loose pump(s) typically require one power source for the fluid cooler and will require one additional source for a single pump or two additional sources for dual pumps. Systems where the pump(s) are mounted and piped integral to the fluid cooler will usually require a single power source.

3.2 Nameplate Ratings

Refer to the unit electrical nameplate for equipment electrical requirements. Minimum circuit ampacity, (MCA) also known as wire sizing amps, will dictate the minimum required wire gauge. Maximum overcurrent protection device amps will dictate the maximum circuit breaker or fuse size.

3.3 Grounding

The unit cabinet must have an uninterrupted true earth ground. An electrical ground wire of adequate size must be connected to the ground lug provided inside the main electrical box.

3.4 Voltage Tolerance

The supply voltage to the unit must be within 10% of the voltage indicated on the unit electrical nameplate. Phase to phase imbalance must not exceed 3%. The local utility company should be contacted for correction of improper line voltage. Deviation from voltage ratings can cause premature failures and possibly void unit warranties.

3.5 Auxiliary Control Wiring

For secondary heat exchangers (condensers and fluid coolers) connect two 18 gauge wires from the electrical box of the indoor evaporator to the electrical box of the remote heat exchanger. Follow the wiring diagrams for each of these pieces of equipment. On most evaporators the terminals will be #42 and #43. On most remote heat exchangers the terminals will be #39 and #40. All control wiring on Data Aire equipment is 24 VAC. Condensing units (compressors mounted in condenser) typically require more wires, refer to wiring diagrams.

Check the wiring connections in the unit control panel to ensure they are tight. Screw terminals may become loose in transit. Tightening of wiring connections is the responsibility of the installing contractor.

3.6 Remote Shutdown

Every *Data Temp* or *Modular Data Temp* evaporator has remote shutdown contacts. These are intended for a field supplied dry contact or switch to be wired across two terminals. When the contact or switch opens, the control circuit power is interrupted and the unit shuts down, including the control panel. The control circuit is 24 VAC and the field provided contact or switch should have a minimum rating of 10 amps.

The remote shutdown contacts are always terminals #1 and #2 on the terminal block designated TB1. The unit will ship with a factory wired metal jumper clip that connects terminal #1 to terminal #2. Remove this clip prior to installing the field wires.

3.7 Remote Alarm Contacts

The *DAP II*, microprocessor control panel provides a remote alarm output contact that can be field accessed on terminals #11 and #12 of terminal block TB1. This is a Normally Open, Close on Alarm, dry contact, intended to be used in a control circuit not exceeding 5 amps at 24 VAC.

This programmable output contact will close on a failure and remain closed until the alarm is no longer present. Two additional alarm output contacts come with the optional expansion module. The terminal designations for these alarm output contact pairs are #44 and #45, and #46 and #47.

3.8 Remote Sensors

Remote sensors are optional. Although existing unit mounted sensors can be removed for remote mounting, the remote sensor option provides a more convenient means of field installation. This is because the sensors are already connected to a predetermined length of cable and come mounted in a remote sensor enclosure. The temperature and humidity sensors require a total of six wires, these should be a twisted, shielded cable.

3.9 Condensate Pumps

Condensate pumps which ship loose normally require a separate source of 110 volt power. Always check the pump power requirements before connecting power. Condensate pumps are available in other voltages.

Condensate pumps may also come unit mounted and powered. While no outside power source is required, field piping is still a requirement.

Condensate pumps are wired to display a “High Condensate Water Level” alarm. The wiring for this must be done in the field on pumps that ship loose. Factory mounted pumps come pre-wired.

3.10 Condensate Probe

A condensate probe for sensing underfloor water is included with this unit. This comes in a plastic bag, with about 15 feet of coiled-up wire. The probe is a flat plate that is typically placed below the unit in a location where water is likely to accumulate.

Place the probe flat on the floor on top of a thin layer of nonconductive silicone. Secure the attached wires where necessary. A longer length of wire may be used if required.

Note: Failure to uncoil the length of wire attached to the condensate probe can result in a nuisance water-detected alarm. If the probe is not going to be used it should be disconnected.

3.11 Water Sensing Cable

Another option for water sensing is the Water Detection Cable. This is a long cable that can sense moisture anywhere along its length. It is typically placed below the unit in a rectangular pattern that matches the perimeter of the unit.

4.0 INSTALLATION OF REMOTE HEAT EXCHANGER

Air cooled condensers and fluid coolers have individual Selection Guide/Operation and Maintenance manuals which should be referred to for more complete details.

4.1 Rigging

Secondary heat exchangers matched with evaporators of this size are typically remote, outdoor type. The heat exchanger should be moved to its (typically rooftop) mounting location using a crane or fork lift. Each fan section has heavy, steel leg supports with lifting holes at the top.

Do not lift with a choke sling around the unit. Spreader bars are recommended for lifting multiple fan units. Under no circumstances should the coil headers or piping be used for lifting the unit. Ideally, the unit should be kept in its shipping crate until it is ready to be set in place.

4.2 Leg Assembly

The legs must be unbolted from their collapsed shipping position and extended prior to placing the unit on its pad. Each leg extends down approximately 18" and reattaches using the same bolts. Note: Failure to extend the legs will result in poor air distribution over the cooling coil resulting in significant capacity reduction.

Concrete pads are often used to provide support for the heat exchanger. Bolt holes in the bottom of each leg can be used to anchor the unit.

4.3 Locating the Remote Heat Exchanger

Remote heat exchangers must be located in an area that will ensure free air flow into and out of the unit plus adequate service clearance. The unit should not be placed any closer than 36" from any wall or other obstruction.

With proper clearance on all other sides, two units can be placed side by side. Additional units should be placed no closer than 48" apart.

4.4 Electrical Service

Refer to Sections 3.1 to 3.5 for information regarding line voltage and control voltage wiring details.

4.5 Air Cooled Condensers - Model DARC

4.5.1 Fan Speed Control

Standard outdoor air cooled condensers have a fan speed controller on the first fan at the header end. On single-fan condensers this is the only means of control. A variable speed controller modulates the motor speed based on system head pressure. The fan speed controller will normally not require field adjustment.

4.5.2 Ambient Thermostats

Additional motors (subsequent to the fan speed control operated motor) on multi-fan condensers are cycled by ambient-sensing thermostats. These thermostats have a capillary tube with a remote

sensing bulb. They will function best if the sensing bulbs are mounted below the coil, away from exposure to direct sunlight, with the bulb in a vertical position.

An instruction set comes as part of a mounting kit that includes a sheet metal bracket, mounting clamp(s) and Tek screws. This includes directions for field mounting and adjusting the thermostat bulbs. Desired head pressure should be maintained at approximately 250 psi.

Air cooled condensers should be placed at a level that is above the level of the indoor evaporator. Mounting a condenser or condensing unit more than ten feet below the evaporator is not recommended. Excessive liquid line pressure drop can cause poor evaporator performance.

4.6 Fluid Coolers - Model DAFC

4.6.1 Fluid-Sensing Thermostats

Fluid cooler fan motors are cycled on and off by individual water-sensing thermostats strapped to the leaving water header. The first fan motor will only have a thermostat if the unit has an energy saver coil. Without the optional energy saver coil, the first fan motor runs whenever there is a call for cooling via an auxiliary signal sent by the indoor evaporator (see also Section 3.5).

The water-sensing thermostats have adjustable setpoints which are typically staggered to maintain water temperature in the 85° to 105° F range. This is generally the desired range for glycol cooled systems.

4.6.2 Energy Saver Cooling

In colder climates, the evaporator will often be equipped with an additional free cooling coil to take advantage of the colder ambient temperatures. When incoming fluid falls below the setpoint of a water-sensing thermostat in the evaporator (typically about 50° F), energy saver cooling becomes available.

Systems with an *Energy Saver Coil* should have at least one fluid-sensing thermostat on the fluid cooler set lower to take advantage of colder ambient temperatures. The desired fluid temperature for energy saver cooling is 45° F. Field adjustment of fluid-sensing thermostats is not unusual.

It is desirable to use the energy saver mode as much as possible. However, fluid temperature that is too cold can cause excessive dehumidification and coil sweating. Fluid temperature that is too high can cause the indoor space temperature to rise. This can cause the indoor *DAP II*, microprocessor controls to lock out the energy saver mode for one hour while it reverts back to compressorized cooling. Adjust the setpoints of the thermostats to allow the maximum free cooling time. Overcooling or undercooling the fluid should be avoided.

Every application will have a different ambient temperature and indoor heat load/air distribution profile. Therefore it is not possible to dictate the exact water-sensing thermostat setpoints. Field adjustments are typical to allow fine-tuning to specific conditions.

5.0 CHARGING

5.1 Voltage Phase Check

5.1.1 Evaporator

Prior to charging, the correct voltage phasing should be checked on the indoor evaporator. It is easiest to check blower direction on the evaporator by momentarily moving the manual bypass switch, located in the *DAP II* control panel, to the “ON” position, then back to the “OFF” position. Reverse any two of the three line voltage wires at the line voltage field connection point to change the blower rotation.

Although the scroll compressor is phase dependent, units shipped from the factory are run tested, ensuring the compressor rotation is consistent with the evaporator fan motor. However, a field change-out the compressor may require checking proper phase. An out-of-phase compressor will draw relatively low amps and both suction and discharge pressures will remain nearly equal.

5.1.2 Secondary Heat Exchanger

The secondary heat exchanger may be ordered as three phase but the individual fan motors are single phase and will only run in one direction. Check operation by placing a momentary jumper across low voltage field terminals #39 and #40. (Disconnect pumps on glycol systems unless already filled with water/glycol solution.) This will energize the control circuit. Fans may not run because: 1) the thermostat setpoint is above the current ambient, or 2) the #1 fan on air cooled condensers with fan speed control react to head pressure. The fan will not run until the head pressure is well over 200 psi.

5.2 Important Refrigeration Components

5.2.1 Expansion Valve

The refrigerant circuit has an adjustable thermo-expansion valve (TXV). It has been factory adjusted to nominal rating. Any field adjustment should be to fine tune a system that has stabilized and already has acceptable operating parameters. Adjusting a TXV to produce large swings in superheat is not recommended.

5.2.2 High Pressure Cutout Switch

The refrigerant circuit is protected by a high head pressure cutout switch with a manual reset button. The cutout pressure rating for refrigerant R-22 is 400 psi. Physical location is near the compressor, usually in the evaporator section.

5.2.3 Low Pressure Cutout Switch

The circuit also contains a low suction pressure cutout switch with automatic reset. The cutout pressure rating for this switch is 30 psi. Physical location is near the compressor, usually in the evaporator section.

5.3 Air Cooled Systems

5.3.1 Fan Speed Control System Charging

The standard air cooled condenser for *Data Temp* or *Modular Data Temp* equipment is a fan speed control system. Connect the refrigerant drum to the low side and charge with vapor. Charge with approximately three lbs per nominal ton. For example, a model DTAU 0534 is a nominal 5 ton unit. Charge circuit with about 15 lbs of refrigerant to begin. Make sure all hoses are properly purged.

Before starting a compressor, the crankcase heaters should be energized for a minimum of 12 hours to reduce the possibility of liquid slugging on start-up. Failure to energize crankcase heater could result in compressor damage.

An easy way to run the blower and compressor is to turn the manual override switches on the *DAP II*, microprocessor, panel to the “ON” position. All automatic control is disabled but safety switches will remain functional.

Start the evaporator fan and compressor. Check the liquid line sight glass to get a feel for the approximate charge. Bubbles in the sight glass are not unusual at this point and can be caused by flashing from liquid line pressure drop, low sub-cooling, or low charge. It is likely that more refrigerant will be required to complete the charging procedure.

Adjust the refrigerant charge until the sight glass clears or has only sparse bubbles. The unit should be allowed to stabilize for several minutes before meaningful measurements can be taken.

After the system is allowed to stabilize, a few key measurements should be noted. The discharge pressure should be about 225 to 275 psi and the sub-cooling should be 8 - 10° F, depending on ambient conditions. Suction temperature should be 58 psi or greater. The superheat at the compressor suction line at least 6 inches away from the compressor should be 8-15° F.

Note: Charging to a full liquid line sight glass should never be the sole means of determining the correct refrigerant charge. Other parameters such as superheat, suction pressure, head pressure, sub-cooling, and ambient temperature are also important parameters. A system charged to a clear sight glass is often overcharged.

5.3 Air Cooled Systems

5.3.2 Flooded System Charging

Flooded systems are units having a refrigerant circuit with an optional liquid receiver and head pressure control valve. When the ambient temperature falls during cold weather, the head pressure control valve will regulate the flow of refrigerant to ensure nearly constant receiver pressure. The condenser is partially flooded with liquid in cold weather. In warm weather the extra refrigerant is stored in the receiver.

Flooded systems require more refrigerant than fan speed control systems. While the unit is under a vacuum, add approximately six lbs of liquid refrigerant per nominal ton directly into the receiver. For example, a model DTAU 0534 is a nominal 5 ton unit. Charge with about 30 lbs of refrigerant to begin. Make sure all hoses are properly purged.

Before starting the compressor, the crankcase heater should be energized for a minimum of 12 hours to reduce the possibility of liquid slugging on start-up. Failure to energize crankcase heater could result in compressor damage.

An easy way to run the blower and compressor is to turn the manual override switches on the *DAP II*, microprocessor panel to the “ON” position. All automatic control is disabled but safety switches will remain functional.

Start the evaporator fan and compressor. Check the liquid line sight glass to get a feel for the approximate charge. Bubbles in the sight glass are not unusual at this point and can be caused by flashing from liquid line pressure drop, low sub-cooling or low charge. It is likely that more refrigerant will be required to complete the charging procedure.

Hook up charging gauges to the suction line. Charge with refrigerant vapor only. If the receiver (head) pressure is below 280 psi, block part of the condenser coil surface until the pressure rises to 280 psi or higher. During extremely cold weather, all of the condenser fans may have to be deenergized to maintain 280 psi.

Observe the sight glass on the receiver. Add refrigerant vapor through the suction line until the level of liquid in the receiver is approximately at the bottom of the sight glass which is at the 80% full level. Observing the receiver sight glass becomes difficult when they are remote mounted near the condenser.

Adjust the refrigerant charge until the sight glass clears or has only sparse bubbles. The unit should be allowed to stabilize for several minutes before meaningful measurements can be taken.

After the system is allowed to stabilize, the superheat at the compressor suction line at least 6 inches away from the compressor should be 8-15° F. Remove the block from the condenser coil. If the ambient temperature while charging is below about 60° F, some of the refrigerant will be backed up in the condenser coil, causing the liquid level in the receiver to drop.

Note: Charging to a full liquid line sight glass should never be the sole means of determining the correct refrigerant charge. Other parameters such as superheat, suction pressure, head pressure, sub-cooling and ambient temperature are also important parameters. A system charged to a clear sight glass is often overcharged.

5.4 Water/Glycol Cooled Systems

5.4.1 Water/Glycol Cooled Systems Charging

All water/glycol cooled units are factory charged. The water regulating valve should be adjusted to maintain 230 to 260 psi head pressure. Suction temperature should be 58 psi or greater. The superheat at the compressor suction line at least 6 inches away from the compressor should be 8-15° F.

Field charging water/glycol systems should be done by referring to the unit electrical nameplate to observe the factory charge. Although this figure represents the original factory charge, it is still necessary to measure and note proper unit operation including superheat, head, and suction pressure. Some adjustment to charge may be required.

Adjust the refrigerant charge until the sight glass clears or has only sparse bubbles. The unit should be allowed to stabilize for several minutes before meaningful measurements can be taken.

All water/glycol cooled units have a water regulating valve. A head pressure sensing transducer is connected to a Shrader fitting on the discharge line and water is regulated into the condenser coil. Condenser coils may be plate fin, coaxial, or shell and tube type.

5.4.2 Factory Charge for Water/Glycol Cooled Systems

Evaporator Model	Factory Charge per Ckt, Lbs. R-22	Evaporator Model	Factory Charge per Ckt, Lbs. R-22
DTW/G* 02	7	DTW/G 08	12
DTW/G* 03	8	DTW/G 10	16
DTW/G* 04	9	DTW/G 13	18
DTW/G* 05	10		

* D - downflow, or U - upflow

5.5 Refrigerant Handling

The use of recovery/recycling units is required by U.S. Environmental Protection Agency (EPA) regulations. Technicians who service and dispose of air conditioning and refrigeration equipment must recover the refrigerant instead of venting it to the atmosphere.

Except for extremely small releases of refrigerant such as what occurs when disconnecting service hoses (diminimous release), a technician who knowingly releases or vents refrigerant to the atmosphere is in violation of this regulation. Freon purchasers must be certified technicians and have a valid EPA certification card.

6.0 GLYCOL SYSTEMS

6.1 Glycol Concentration

The system must be filled with water and the appropriate amount of ethylene or propylene glycol to protect against winter freeze-up. To achieve the approximate glycol concentration, it is necessary to know the total system volume. This consists of the sum of the fluid cooler volume, the evaporator unit volume, and the volume of the interconnecting piping.

The following tables can be used for arriving at an approximate system volume. After installation, the glycol percentage should be checked. The glycol percentage should also be checked at regular intervals to ensure freeze protection.

6.2 Internal (Fluid) Volume - Downflow Models

Evaporator Model	Without Energy Saver Coil Volume, Gallons	With Energy Saver Coil Volume, Gallons
DTGD 02	2.0	3.5
DTGD 03	2.5	3.5
DTGD 04	2.5	5.0
DTGD 05	2.5	5.0
DTGD 08	4.5	N/A
DTGD 10	5.0	N/A
DTGD 13	5.5	N/A

6.3 Internal (Fluid) Volume - Upflow Models

Evaporator Model	Without Energy Saver Coil Volume, Gallons	With Energy Saver Coil Volume, Gallons
DTGU 02	1.6	3.0
DTGU 03	1.6	3.0
DTGU 04	2.0	4.5
DTGU 05	2.0	4.5
DTGU 08	4.5	N/A
DTGU 10	5.0	N/A
DTGU 13	5.5	N/A

Note: Add 25% more for Shell and Tube condenser coils.

6.4 Fluid Cooler Internal Volume

Fluid Cooler Internal Volume Model	Volume, Gallons
DAFC 06	2.5
DAFC 07	3.4
DAFC 09	4.2
DAFC 11	3.3
DAFC 15	4.9
DAFC 17	6.6
DAFC 21	7.4
DAFC 24	9.8
DAFC 28	12.3
DAFC 30	9.8
DAFC 37	13.0
DAFC 40	16.3
DAFC 44	16.2
DAFC 50	20.3
DAFC 57	24.6
DAFC 61	19.6
DAFC 75	26.0
DAFC 80	32.6
DAFC 88	32.4
DAFC 100	40.6

6.5 Copper Piping Internal Volume

Pipe Diameter inches	Volume per 100 Feet of Pipe, Gallons
5/8	1.2
3/4	1.8
7/8	2.5
1-1/8	4.3
1-5/8	9.2
2-1/8	16.1
2-5/8	24.8
3-1/8	35.4
4-1/8	62.2

6.6 Freezing Point of Aqueous Solutions

Ethylene Glycol % by Volume	Freezing Point Degrees F	Propylene Glycol % by Volume	Freezing Point Degrees F
0	32	0	32
10	24	10	27
20	15	20	18
30	4	30	8
40	-13	40	-6
50	-33	50	-26

7.0 CONTROLS

7.1 DAP II Microprocessor Control Panel

The standard controls on all *Data Aire Temp* and *Modular Data Temp* equipment is the *DAP II* microprocessor control panel. This state-of-the-art control panel has a separate manual that goes into extensive detail regarding functions, features, programming, and troubleshooting.

The *DAP II* microprocessor control panel has an entire manual dedicated to its use and operation. This manual must be referenced to complete a thorough unit installation. Start-up is not complete until the *DAP II* control panel settings are established.

7.2 Secondary Heat Exchangers

Most of the controls on remote condensers, condensing units, and fluid coolers consist of basic electromechanical type components. Secondary heat exchangers have separate Selection Guide/ Operation and Maintenance manuals which give complete details on adjusting thermostat settings, etc. Refer also to details in Section 3.5 within this manual.

7.3 Wiring Diagrams

Every *Data Temp* or *Modular Data Temp* evaporator, condenser, condensing unit, or fluid cooler comes with a wiring diagram. These diagrams are 'ladder'- type schematics intended for service personnel. The intent is to allow the technician to understand the wiring details associated with the electrical components and how they interface with the *DAP II* control panel as well as peripheral equipment, including secondary heat exchangers.

The wiring diagram in the evaporator will indicate field interface terminals to the secondary heat exchanger. The internal wiring of the heat exchanger is found on a separate diagram which can be found on the inside cover of the heat exchanger electrical box. Both diagram types are also placed inside the shipping/warranty packet that is placed inside the evaporator.

Evaporator wiring diagrams will have a drawing number which starts out with the three letter designation, "DTX". An example of a typical diagram is DTX-S-603 N. Wiring diagrams for condensers or condensing units start out with the three letter designation, "DRC". An example of a typical diagram is DRC-S-001. Wiring diagrams for fluid coolers start out with the three letter designation, "DFC". An example of a typical diagram is DFC-S-001.

8.0 REGULAR MAINTENANCE ITEMS

8.1 Filters

Filters should be checked on a regular basis and changed when they become dirty. This will ensure efficient operation of the unit. Although the unit has a dirty filter alarm, this should not be relied on as the only determinant for replacing filters. A maladjusted filter differential pressure switch may not give a proper indication of a clogged filter.

To check the filter differential pressure switch for proper adjustment, temporarily cover about 75% of the return air opening using heavy cardboard or similar material. The alarm should energize when 75% of the air is blocked, simulating dirty filters. If the alarm energizes prematurely or does not energize at all, the pressure switch should be adjusted. Doors must remain closed when determining if an adjustment is necessary.

Spare filters should be kept in stock as these tend to be a frequently replaced maintenance item. Filters may require changing as often as monthly. Note also that construction dust on new installations will quickly clog new filters.

Filters that require changing can restrict airflow and create problems such as coil icing or poor air distribution.

8.2 Belts

Belt tension should be checked regularly (monthly) to ensure proper tension. If tightening is required, loosen the four motor mounting bolts. Turn the adjustment screw on the end of the motor mounting channel until the proper belt tension is attained. Retighten the four mounting bolts. Damage can also occur to belts that are overtightened. The amount of play in a typical drive set should be 1/2 inch.

8.3 Bearings

Pillow block bearings used on many models have zirk type grease fittings. These will only require grease once annually. Care should be taken to avoid over-greasing. Only one or two pumps from a manual gun are required. All other blower bearings are permanently lubricated and do not require maintenance.

Most blower motors have sealed bearings and are maintenance free. Some motors have zirk type grease fittings on the bearings. If so the motor should be greased once annually. Care should be taken to avoid over-greasing. Only one or two pumps from a manual gun are required.

8.4 Humidifier Canisters

Steam generator type humidifier is standard on *Data Temp* and *Modular Data Temp* equipment. There is no maintenance required other than to replace the canister as required. This frequency will depend on usage and water type. A set of manufacturer's instructions for the humidifier is sent as part of the paperwork placed inside the unit when it ships.

8.5 Fuses

Fuses will occasionally require changing especially with installations where the voltage is not consistent. Drops in voltage can create brief periods of high amp draw, causing fuses to blow. Always replace fuses with those of the equivalent rating with regard to: 1) amperage, 2) voltage, and 3) speed. For instance compressors and motors are inductive loads which require time delay fuses. Electric reheat and humidifiers are resistive loads requiring fast acting fuses.

8.6 Heating Elements

Heating elements do not normally require maintenance. However sometimes they may accumulate a film of dust or dirt when unused for extended periods of time. When energized, the burning debris can create smoke or unpleasant odor. To help avoid this, periodic cleaning is recommended.

8.7 Refrigerant Filter Drier

Factory installed refrigerant filter driers do not normally require maintenance. When replacing compressor or other repairs that open the refrigeration system to atmosphere, it is advisable to replace the filter drier. The equivalent type and size should be used.

9.0 Warranty Policy

Seller warrants its equipment to Buyer to be free from defects in material and workmanship for a period of fifteen (15) months from date of shipment or twelve (12) months from date of start-up, whichever comes first, as long as equipment is utilized under normal conditions, serviced, and is properly installed; however, the warranty shall not be applicable to any of the following items: refrigerant, belts, filters, humidifier, heaters not regularly cleaned, light bulbs, and any other items either consumed or worn out by normal wear and tear, or by conditions beyond Seller's control, including (without limitation as to generally) polluted or contaminated air or water.

The Seller's obligation under this warranty is limited solely to the repair or replacement, at Seller's options, of any part or parts thereof which shall, within fifteen (15) months from date of shipment of the equipment to the original purchaser be returned to the factory, transportation charges prepaid, which upon examination shall disclose to the Seller's satisfaction to have been defective under normal use and service. This agreement to repair or replace defective parts is expressly in lieu of all other warranties, expressed or implied and all other obligations or liabilities on the part of Seller and Seller neither assumes nor authorizes any other person to assume for it any liability of obligation in connection with the sales or service of its equipment, except said repair or replacement of defective parts set forth above.

This warranty does not include any labor charges for work done outside of the factory for replacement of parts, adjustments, repairs, or any other work. Seller's liability does not include any resulting damage to persons, property, equipment, goods or merchandise arising out of any defect in or failure of any equipment of its manufacture and Buyer hereby waives any claim against Seller arising out of such claim. This warranty shall not cover the repair or replacement of any equipment which has been repaired or altered outside of the factory in any way or which has been subject to negligence, misuse, or abuse, or to pressures in excess of stated limits. On parts not manufactured by Seller, such as motors, controls, etc., the warranty extended to Buyer shall be the same warranty as that given to Seller by its supplier.

This warranty applies only to the original purchaser of the equipment and does not extend, expressly or by implication, to the third parties or others without the specific written approval and acknowledgment of Seller. Buyer's exclusive remedy and Seller's maximum liability for any and all loss, injury, damage, costs, or expense arising from any defect covered by this warranty shall be limited to the repair or replacement, but not the installation of any defective material, F.O.B., Seller's plant; provided however, that Seller shall not be required to replace any part or component (a) which can be repaired, or (b) unless Buyer has given Seller immediate written notice that replacement or repair is indicated; and, provided further, however, that Seller shall not be liable for any cost or expense of replacement or repair contracted for by Buyer with any third person, unless, and then only to the extent that Seller authorizes in writing, such costs or expense.

Seller shall not be liable for any direct, indirect incidental, consequential, or other loss, injury, damage cost, or expense, whether caused by delay, failure, or performance, breach of warranty, or by any cause whatsoever.

Seller's obligation under this warranty shall be void if Buyer fails: (a) without legal justification to pay Seller, when due, the full purchase price for the equipment sold hereunder; or (b) to have the equipment sold hereunder installed, maintained, and serviced by competent personnel and in accordance with Seller's instructions.

10.0 Contact Data Aire

Address:

Data Aire Inc.
230 W. BlueRidge Avenue
Orange, CA 92865

Phone

714-921-6000
800-347-AIRE (2473) Toll Free

Fax:

714-921-6010	Main
714-921-6011	Engineering
714-921-6022	Part Sales

E-mail:

tech_support@dataaire.com	Technical Support
engineering@dataaire.com	Engineering
sales@dataaire.com	Sales

Web site:

www.dataaire.com

Job information:

Evaporator
Model Number: DT__ __ - __ __ __ __ - __ __

Serial Number: __ __ __ __ - __ __ __ __ - __

Condenser/Fluid Cooler:
Model Number: D __ __ __ __ __ __ __ - __ __

Serial Number: __ __ __ __ - __ __ __ __ - __

Job number: _____

Date installed: ___ / ___ / 200___

Installing Contractor: _____

RECOMMENDED LINE SIZING FOR AIR COOLED SPLIT SYSTEMS UP TO 200 EQUIVALENT FEET

HOT GAS LINES

SINGLE CIRCUIT SYSTEMS

Unit Tonnage	Tons per Circuit	EQUIVALENT FEET 50	100	150	200
1	1	5/8	5/8	5/8	7/8
1.5	1.5	5/8	5/8	7/8	7/8
2	2	5/8	7/8	7/8	7/8
2.5	2.5	5/8	7/8	7/8	7/8
3	3	7/8	7/8	7/8	7/8
4	4	7/8	7/8	7/8	1-1/8
5	5	7/8	1-1/8	1-1/8	1-1/8
6	6	7/8	1-1/8	1-1/8	1-1/8
8	8	1-1/8	1-1/8	1-3/8	1-3/8
10	10	1-1/8	1-1/8	1-3/8	1-3/8
13	13	1-1/8	1-3/8	1-3/8	1-3/8

DUAL CIRCUIT SYSTEMS

Unit Tonnage	Tons per Circuit	EQUIVALENT FEET 50	100	150	200
6	3	7/8	7/8	7/8	7/8
8	4	7/8	7/8	7/8	1-1/8
10	5	7/8	1-1/8	1-1/8	1-1/8
13	6.5	7/8	1-1/8	1-1/8	1-1/8
16	8	1-1/8	1-1/8	1-3/8	1-3/8
20	10	1-1/8	1-1/8	1-3/8	1-3/8
26	13	1-1/8	1-3/8	1-3/8	1-3/8
30	15	1-3/8	1-3/8	1-3/8	1-5/8

LIQUID LINES

SINGLE CIRCUIT SYSTEMS

Unit Tonnage	Tons per Circuit	EQUIVALENT FEET 50	100	150	200
1	1	3/8	3/8	3/8	3/8
1.5	1.5	3/8	3/8	3/8	3/8
2	2	3/8	1/2	1/2	1/2
2.5	2.5	3/8	1/2	1/2	1/2
3	3	1/2	1/2	1/2	1/2
4	4	1/2	5/8	5/8	5/8
5	5	1/2	5/8	5/8	5/8
6	6	1/2	5/8	5/8	5/8
8	8	5/8	7/8	7/8	7/8
10	10	5/8	7/8	7/8	7/8
13	13	7/8	7/8	7/8	7/8

DUAL CIRCUIT SYSTEMS

Unit Tonnage	Tons per Circuit	EQUIVALENT FEET 50	100	150	200
6	3	1/2	1/2	1/2	1/2
8	4	1/2	5/8	5/8	5/8
10	5	1/2	5/8	5/8	5/8
13	6.5	1/2	5/8	5/8	5/8
16	8	5/8	7/8	7/8	7/8
20	10	5/8	7/8	7/8	7/8
26	13	7/8	7/8	7/8	7/8
30	15	7/8	7/8	7/8	7/8

SUCTION LINES

SINGLE CIRCUIT SYSTEMS

Unit Tonnage	Tons per Circuit	EQUIVALENT FEET 50		100		150		200	
		HOR	VER	HOR	VER	HOR	VER	HOR	VER
1	1	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
1.5	1.5	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
2	2	7/8	7/8	7/8	7/8	7/8	7/8	1-1/8	7/8
2.5	2.5	7/8	7/8	7/8	7/8	7/8	7/8	1-1/8	7/8
3	3	7/8	7/8	1-1/8	7/8	1-1/8	7/8	1-1/8	7/8
4	4	1-1/8	1-1/8	1-1/8	1-1/8	1-1/8	1-1/8	1-3/8	1-1/8
5	5	1-1/8	1-1/8	1-1/8	1-1/8	1-3/8	1-1/8	1-3/8	1-1/8
6	6	1-1/8	1-1/8	1-3/8	1-1/8	1-3/8	1-1/8	1-5/8	1-3/8
8	8	1-3/8	1-3/8	1-3/8	1-3/8	1-3/8	1-3/8	1-5/8	1-3/8
10	10	1-3/8	1-3/8	1-5/8	1-3/8	1-5/8	1-5/8	1-5/8	1-5/8
13	13	1-3/8	1-3/8	1-5/8	1-5/8	1-5/8	1-5/8	2-1/8	1-5/8

HOR = HORIZONTAL

VERT = VERTICAL

DUAL CIRCUIT SYSTEMS

Unit Tonnage	Tons per Circuit	EQUIVALENT FEET 50		100		150		200	
		HOR	VER	HOR	VER	HOR	VER	HOR	VER
6	3	7/8	7/8	1-1/8	7/8	1-1/8	7/8	1-1/8	7/8
8	4	1-1/8	1-1/8	1-1/8	1-1/8	1-1/8	1-1/8	1-3/8	1-1/8
10	5	1-1/8	1-1/8	1-1/8	1-1/8	1-3/8	1-1/8	1-3/8	1-1/8
13	6.5	1-1/8	1-1/8	1-3/8	1-1/8	1-3/8	1-1/8	1-5/8	1-3/8
16	8	1-3/8	1-3/8	1-3/8	1-3/8	1-3/8	1-3/8	1-5/8	1-3/8
20	10	1-3/8	1-3/8	1-5/8	1-3/8	1-5/8	1-5/8	1-5/8	1-5/8
26	13	1-3/8	1-3/8	1-5/8	1-5/8	1-5/8	1-5/8	2-1/8	1-5/8
30	15	1-5/8	1-3/8	1-5/8	1-5/8	2-1/8	1-5/8	2-1/8	1-5/8

Data Aire, Inc.

Monthly Maintenance Inspection Checklist

Model No. _____ Serial No. _____
Prepared by: _____ Date: ___ / ___/ 200__

Air Filters
___ Check for restricted air flow

Blower Section
___ Blower wheel free of debris moves freely
___ Check belt tension and condition
___ Bearings in good condition
___ Check pulleys and motor mounts

Air Distribution Section
___ Check for restriction in grille(s)

Compressor
___ Check oil level (Semi-compressor only)
___ Check for leaks

Refrigeration Cycle/Section
___ Check crank case temperature

Air Cooled Condenser (if applicable)
___ Condenser coil clean
___ Motor Mounts tight
___ Motor fan bearings in good condition
___ Refrigeration lines properly supported

Water/Glycol Fluid Cooler (if applicable)
___ Water regulating valve function
___ Check for water/glycol leaks (piping area)

Glycol Pump(s)
___ Glycol leaks (pump area)
___ Pump operation
___ Auto air vent clean of mineral deposits

Condensate Drain and Pump (if applicable)
___ Check for water leaks
___ Check for restricted air flow
___ Pump operation

Steam Generating Humidifier
___ Check canister for deposits and water level
___ Check condition of steam hose and clamps

Infrared Humidifier (if applicable)
___ Check humidifier lamps
___ Check pan for mineral deposits

Electrical Panel
___ Check contactor operation
___ DAPII control panel operations

Equipment Runtimes

Blower	_____	hrs
Condenser	_____	hrs
Compressor	_____	hrs
Reheat No. 1	_____	hrs
Reheat No. 2	_____	hrs
Reheat No. 3	_____	hrs
Humidifier	_____	hrs
Dehumidification	_____	hrs
Energy Saver	_____	hrs

__ Reset all to read zero runtimes

Temperature/Humidity set at: ___° ___% RH

Notes: _____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Data Aire, Inc.

Quarterly Maintenance Inspection Checklist

Model No. _____ Serial No. _____
Prepared by: _____ Date: ___ / ___/ 200__

Air Filters
- ____ Check for restricted air flow
- ____ Check filter differential switch
- ____ Wipe filter rack section clean

Blower Section
- ____ Blower wheel free of debris and moves freely
- ____ Check belt tension and condition
- ____ Bearings in good condition
- ____ Check air flow safety switch operation
- ____ Check pulleys and motor mounts

Air Distribution Section
- ____ Check for restriction in grille(s)

Compressor
- ____ Check oil level (Semi-hermetic compressor only)
- ____ Check for leaks

Refrigeration Cycle/Section
- ____ Check for moisture (site glass)
- ____ Check suction pressure
- ____ Check discharge pressure
- ____ Check hot gas bypass valve operation
- ____ Check thermostatic expansion valve op
- ____ Check solenoid valve operation

Air Cooled Condenser (if applicable)
- ____ Condenser coil clean
- ____ Motor mounts tight
- ____ Motor fan bearings in good condition
- ____ Refrigeration lines properly supported
- ____ Heated receiver site glass #1 __ #2 __

Water/Glycol Fluid Cooler (if applicable)
- ____ Water regulating valve function
- ____ Check solution _____%
- ____ Check for water/glycol leaks (piping area)
- ____ Water/Glycol flow switch operational

Glycol Pump(s)
- ____ Glycol leaks (pump area)
- ____ Pump operation
- ____ Auto air vent clean of mineral deposits

Condensate Drain and Pump (if applicable)
- ____ Check for water leaks and restricted flow
- ____ Pump operation

Steam Generating Humidifier
- ____ Check canister for deposits and water level
- ____ Check condition of steam hose and clamps
- ____ Check drain and fill valve for deposits

Infrared Humidifier (if applicable)
- ____ Check humidifier lamps
- ____ Check pan for mineral deposits
- ____ Check high limit switch operation
- ____ Check drain timer operation
- ____ Check drain valve operation

Reheat
- ____ Check reheat element(s) for dust
- ____ Check high limit switch operation

Electrical Panel
- ____ Check fuses
- ____ Check contactor operation
- ____ Check all electrical connections
- ____ Check operation sequence
- ____ Check calibration of change over thermostat (Energy Saver System Only)

DAPII control panel operations
- ___ Check calibration of temperature sensor (47*)
- ___ Check calibration of humidity sensor (48*)
- ___ Check calibration of discharge air sensor (49*)

* DAP II menu options

Equipment Runtimes

Blower	_____	hrs
Condenser	_____	hrs
Compressor	_____	hrs
Reheat No. 1	_____	hrs
Reheat No. 2	_____	hrs
Reheat No. 3	_____	hrs
Humidifier	_____	hrs
Dehumidification	_____	hrs
Energy Saver	_____	hrs

___ Reset all to read zero runtimes

Temperature/Humidity set at: _____° _____% RH

Notes: _____
_____
_____
_____
_____

Superheat and Suction Pressure Trouble Shooting Guide

Low Suction Pressure and High Superheat

1. Moisture, dirt, wax
2. Undersized valve*
3. High superheat adjustment
4. Gas charge condensation
5. Dead thermostatic element charge
6. Wrong thermostatic charge
7. Evaporator pressure drop - no external equalizer
8. External equalizer location
9. Restricted or capped external equalizer
10. Low refrigerant charge
11. Liquid line vapor
    a. Vertical lift
    b. High friction loss
    c. Long or small line
    d. Plugged drier or strainer
12. Low pressure drop across valve
    a. Same as #11 above
    b. Undersized distributor nozzle or circuits
    c. Low condensing temperature

High Suction Pressure - Low Superheat

1. Oversized valve*
2. TEV seat leak
3. Low superheat adjustment
4. Bulb installation
    a. Poor thermal contact
    b. Warm location
5. Wrong thermostatic charge
6. Bad compressor - low capacity
7. Moisture, dirt, wax
8. Incorrectly located external equalizer

Low Suction Pressure - Low Superheat

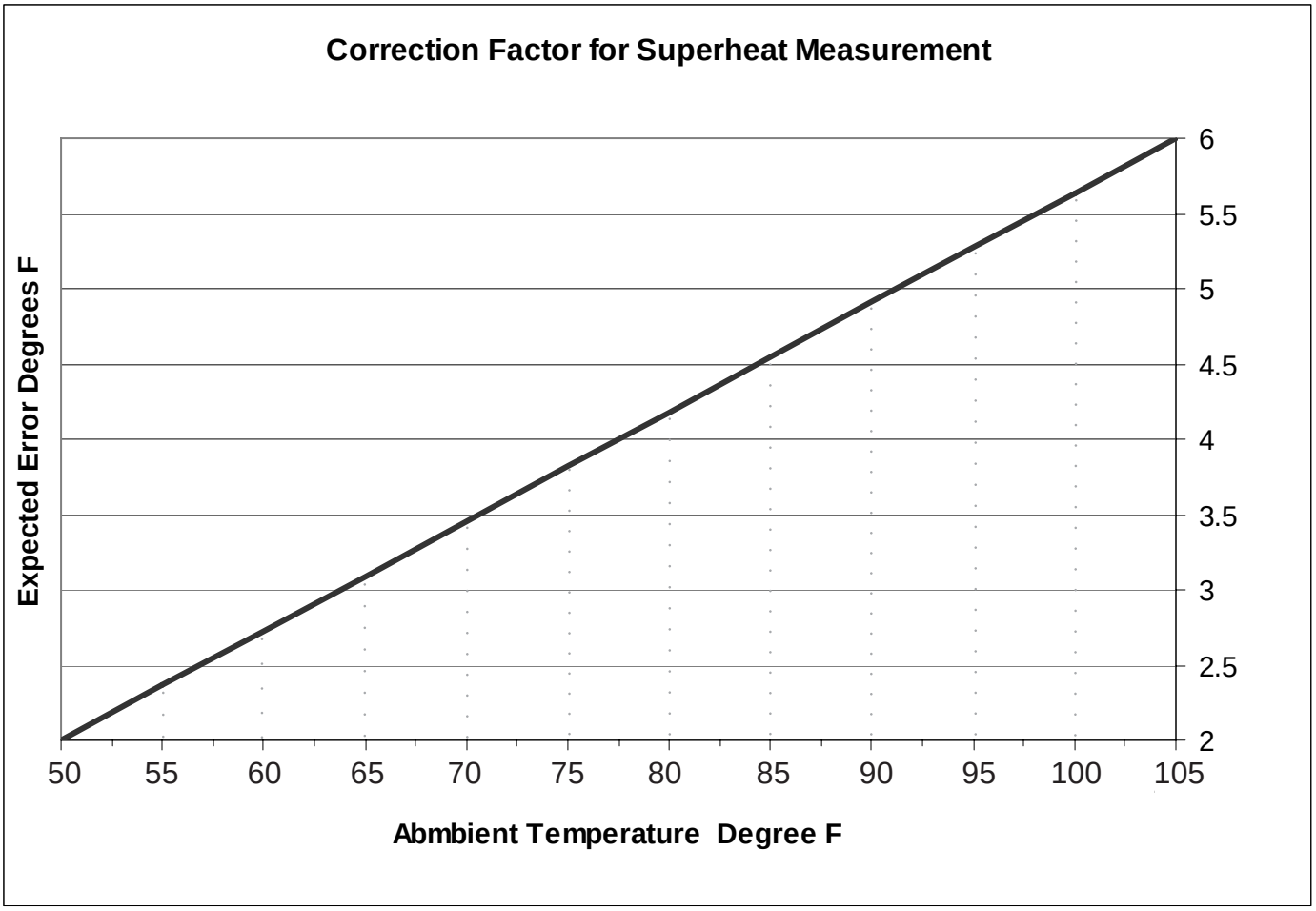
1. Low load
    a. Not enough air
    b. Dirty air filters
    c. Coil icing
2. Poor air distribution
3. Poor refrigerant distribution
4. Improper compressor-evaporator balance
5. Evaporator oil logged
6. Flow from one TEV affecting another's bulb

* Data Aire has ensured that valves are size properly as the unit ships from the factory.

Temperature Pressure Chart for R-22

Temperature	Pressure, PSI	Temperature	Pressure, PSI
26	50.0	50	84.1
27	51.2	55	92.6
28	52.4	60	101.6
29	53.7	65	111.3
30	54.9	70	121.5
31	56.2	75	132.2
32	57.5	80	143.7
33	58.8	85	155.7
34	60.2	90	168.4
35	61.5	95	181.9
36	62.9	100	196.0
37	64.3	105	210.8
38	65.7	110	226.4
39	67.1	115	242.8
40	68.6	120	260.0
41	70.0	125	278.1
42	71.5	130	297.0
43	73.0	135	316.7
44	74.5	140	337.4
45	76.1	145	359.1
46	77.6	150	381.7
47	79.2		
48	80.8		
49	82.4		

Pressure-Pounds per Square inch gauge - standard type


Correction Factor for Superheat Measurement
Expected Error Degrees F
6
5.5
5
4.5
4
3.5
3
2.5
2
50
55
60
65
70
75
80
85
90
95
100
105
Abmbient Temperature Degree F

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