gPod
DX, Air, Water or Glycol Cooled
Ceiling and Floor Mounted

Installation, Operation, & Maintenance Manual

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

www.dataaire.com
CONGRATULATIONS ON THE SELECTION OF A DATA AIRE PRECISION ENVIRONMENTAL CONTROL SYSTEM. PROPER ADHERENCE TO THIS INSTALLATION, OPERATION AND MAINTENANCE MANUAL FOR THIS EQUIPMENT WILL ENSURE YEARS OF OPTIMAL PERFORMANCE.

There are separate installation, operation, and maintenance (IOM) manuals for other components of your Data Aire precision cooling system including dap4 or Mini-dap4, air-cooled condensers, and fluid coolers.

This manual is intended to assist trained service personnel by providing necessary guidelines for this 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.

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

© Copyright 2019 Data Aire Inc. all pages and content
IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

Safety Alert Symbols and Words for Hazard Alerting Safety

**DANGER** indicates a hazardous situation which, if not avoided, will result in serious injury or death.

**WARNING** indicates a hazardous situation which, if not avoided, could result in serious injury or death.

**CAUTION** indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**NOTICE** indicates information considered important but may have potential hazard for personal injury or property damage. Special care should be given to those areas where these symbols appear.

During installation, operation, maintenance or service, individuals may be exposed to certain components or conditions including, but not limited to: refrigerants, oils, and materials under pressure, rotating components, and both high and low voltage. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death. It is the obligation and responsibility of operating/service personnel to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment and the property in which it is situated, as well as severe personal injury or death to themselves and people at the site.

This document is intended for use by owner-authorized operating/service personnel. It is expected that this individual possesses independent training that will enable them to perform their assigned tasks properly and safely. It is essential that, prior to performing any task on this equipment, this individual shall have read and understood this document and any referenced materials. This individual shall also be familiar with and comply with all applicable governmental standards and regulations pertaining to the task in question.

This manual contains important safety instructions that should be followed during the installation and maintenance of Data Aire equipment. Read this manual thoroughly before attempting to install or operate this unit.

Only qualified personnel should move, install or service this equipment. Adhere to all warnings, cautions and instructions on the unit and in this manual. Follow all operating and user instructions.

---

**WARNING** Risk of electric shock can cause injury or death. Disconnect local and remote electrical power before working within unit.

Customer must provide earth ground to unit, per NEC, CEC and local codes, as applicable. Before proceeding with installation, read all instructions, verify that all the parts are included and check the nameplate to be sure the voltage matches available utility power.
### WARNING

The Data Aire dap4 or Mini-dap4 microprocessor does not isolate power from the unit, even in the “Unit Off” mode. Some internal components require and receive power even during the “Unit Off” mode of Data Aire dap4™ control.

The factory-supplied optional disconnect switch is located inside the unit’s electrical control panel. The supply voltage side of the disconnect switch contains live high voltage. The only way to ensure that there is NO voltage inside the unit is to install and open a remote facility disconnect switch.

### WARNING

Risk of explosive discharge from high-pressure refrigerant. Can cause injury or death. This unit contains fluids and gases under high pressure. Relieve pressure before working with piping.

### WARNING

Risk of refrigerant system rupture or explosion from overpressurization can cause equipment damage, injury or death.

### WARNING

Risk of contact with high-speed moving parts can cause injury or death. Disconnect all local and remote electric power supplies before working in the unit. Do not operate unit with any or all cabinet panels removed. Do not operate up flow units without installing a plenum, ductwork or guard over the blower opening(s) on the top surface of the unit cabinet. Ductwork must be connected to the blower(s), or a plenum must be installed on the blower deck for protection from rotating blower wheel(s) on up flow units.

### CAUTION

Risk of contact with hot surfaces can cause injury. The compressors, refrigerant discharge lines, humidifiers and reheat are extremely hot during unit operation. Allow enough time for them to cool before working within the unit cabinet. Use extreme caution and wear protective gloves and arm protection when working on or near hot compressors, discharge lines, humidifiers and reheat.

### CAUTION

Risk of handling heavy and lengthy parts can cause personal injury and equipment damage. Follow relevant OSHA lifting recommendations and consider using a two-person lift for safe and comfortable removal and installation of cabinet panels. Only properly trained and qualified personnel wearing appropriate safety headgear, gloves and shoes should attempt to remove or install cabinet panels.

### NOTICE

Risk of clogged or leaking drain lines can cause equipment and building damage. This unit requires a condensate water drain connection. Drain lines must be inspected regularly and maintenance must be performed to ensure that drain water runs freely through the drain system and that lines are clear.
and free of obstructions and in good condition with no visible sign of damage or leaks. Improper installation, application and service practices can result in water leakage from the unit. Water leakage can result in severe property damage and loss of critical data center equipment. Do not locate unit directly above any equipment that could sustain water damage. Data Aire recommends installing leak detection equipment for unit and supply lines.

**NOTICE** Risk of a leaking coil due to freezing and/or corrosion can cause equipment and serious building damage. Cooling and heat rejection coils, heat exchangers and piping systems that are connected to open cooling towers or other open water/glycol systems are at high risk for freezing and premature corrosion. Fluids in these systems must contain the proper antifreeze and inhibitors to prevent freezing and premature coil corrosion. The water or water/glycol solution must be analyzed by a competent water treatment specialist before startup to establish the inhibitor requirement. The water or water/glycol solution must be analyzed every six months to determine the pattern of inhibitor depletion. The complexity of water-caused problems and their correction makes it important to obtain the advice of a water treatment specialist and follow a regularly scheduled maintenance program.

**NOTICE** Installation and maintenance must be performed only by qualified personnel who are familiar with this type of equipment.

**WARNING** Refrigerant can be harmful if it is inhaled. Refrigerant must be used and recovered responsibly. Failure to follow this warning may result in personal injury or death.

**CAUTION** Do not operate doors when unit is not on a flat surface.

**WARNING** Pressure-relief line must be vented to the atmosphere per the latest edition of ASHRAE standard and/or any local building, fire or mechanical codes. This is for units with shell and tube and units with high pressure relief valve.

**NOTICE** Maintain a minimum clearance of 36 inches or width of the unit whichever is larger.

**NOTICE** Altering, modification or equal of our product may void warranty and or void regulatory certification(s). Field rearrangement of components are not recommended.
NOTICE  Any installation of an auxiliary device shall not require the cutting, wiring or the soldering of connections by the installer, and shall not require cutting, drilling or welding in the electrical enclosure(s) and in other areas where such operations may damage electrical or refrigeration components and wiring.

CAUTION  For replacement of fuses, replace with same size fuse size and type or equivalent.

NOTICE  Data Aire products are strictly for non-residential applications.

NOTICE  Using substitute parts or bypassing electrical or refrigeration components is not recommended and will VOID THE WARRANTY.

NOTICE  Using substitute parts or bypassing electrical or refrigeration components is not recommended and will VOID THE WARRANTY.

NOTICE TO CUSTOMER/CONTRACTOR PROTECT YOUR WARRANTY PRIOR TO STARTUP.
• Read and follow the Installation & Start-up Instructions provided with this equipment.
• Storage of this equipment must be on a flat surface and protected from the weather.
• Protect this equipment from damage, construction dirt, debris, freezing temperatures and water.
• Make sure all shipping materials have been removed.
• A qualified startup technician must complete the Data Aire “Field start up test sheet”
# Table of Contents

1  **INTRODUCTION**......................................................................................................................... 1

1.1  **PRODUCT INFORMATION - WHAT IS GPOD?** ........................................................................... 1

1.2  **MODEL IDENTIFICATION NOMENCLATURE** ............................................................................. 1

1.2.1  Ceiling Mounted Units .................................................................................................................. 1

1.2.2  Floor Mounted Units .................................................................................................................... 1

1.3  **DELIVERY INSPECTION** ........................................................................................................... 2

1.4  **PAPERWORK** ............................................................................................................................ 2

2  **INSTALLATION**............................................................................................................................... 3

2.1  **RECOMMENDED TOOLS FOR INSTALLATION** ........................................................................ 3

2.2  **PRE-INSTALLATION** .................................................................................................................. 3

2.2.1  Room Considerations .................................................................................................................. 4

2.3  **LOCATING FLOOR UNITS** .......................................................................................................... 4

2.3.1  Upflow Units .................................................................................................................................. 6

2.3.2  Horizontal Airflow Units ............................................................................................................ 7

2.3.3  Indoor Condensers ....................................................................................................................... 8

2.4  **STORAGE** .................................................................................................................................... 8

2.4.1  Suggested Reference Storage Room Conditions ........................................................................... 9

2.4.2  General Storage Considerations .................................................................................................. 9

2.5  **FIELD PIPING CONNECTIONS INSTALLATION** ........................................................................ 10

2.6  **ELECTRICAL INSTALLATION** ................................................................................................. 10

2.7  **REFRIGERATION SETUP** ............................................................................................................ 10

2.7.1  Leak Test ...................................................................................................................................... 11

2.8  **SYSTEM CONTROL SETUP** ....................................................................................................... 11

2.9  **POST INSTALLATION** .................................................................................................................. 11

2.10  **INSTALLATION OF REMOTE HEAT EXCHANGER** ................................................................. 12

2.11  **VOLTAGE PHASE CHECK** ....................................................................................................... 12

2.11.1  Evaporator Power Phasing ........................................................................................................ 12

2.11.2  Remote Heat Exchanger ............................................................................................................ 12

3  **PIPING**........................................................................................................................................... 13

3.1  **REFRIGERANT PIPING** ................................................................................................................. 13

3.2  **SPLIT AIR-COOLED UNIT PIPING** ........................................................................................... 15

3.2.1  Discharge Lines ........................................................................................................................... 15

3.2.2  Liquid Lines ................................................................................................................................... 16

3.2.3  Line Traps: ................................................................................................................................... 16

3.2.4  Field Piping, Remote Condenser Above Evaporator .................................................................... 17

3.2.5  Field Piping, Remote Condenser Below Evaporator ................................................................... 18

3.2.6  Connection Sizes, Air-Cooled Units ........................................................................................... 18

3.3  **RECOMMENDED LINE SIZING FOR AIR-COOLED SPLIT SYSTEMS** .................................... 19

3.3.1  Hot Gas Lines: Single Circuit Units (Up to 200 Equivalent Feet) .................................................. 19

3.3.2  Liquid Lines: Single Circuit Units (Up to 200 Equivalent Feet) ................................................... 19
3.3.3 Total Equivalent Line Length Calculation .....................................................................................20
3.4 POST PIPING INSTALLATION ........................................................................................................20
3.5 WATER/GLYCOL COOLING UNIT PIPING..................................................................................20
  3.5.1 Field Piping, Water/Glycol System .......................................................................................21
  3.5.2 Connection Sizes, Water/Glycol Cooled Units .....................................................................22
3.6 CO2 PIPING ..................................................................................................................................22
3.7 CONDENSATE DRAIN PIPING .....................................................................................................22
  3.7.1 Condensate Trap ..................................................................................................................23
3.8 HUMIDIFIER PIPING .....................................................................................................................24
3.9 LEAK TESTING .............................................................................................................................24
3.10 EVACUATION ...............................................................................................................................25
  3.10.1 Evacuation Procedures .......................................................................................................25

4 CHARGING .....................................................................................................................................27
  4.1 AIR COOLED SYSTEMS ..............................................................................................................27
    4.1.1 Packaged Air-Cooled Systems Ceiling Units (2.5 to 5 Ton) ..................................................27
    4.1.2 Split Air-Cooled Systems Charging (Units with Indoor Condenser or Outdoor Condenser) ....28
    4.1.3 Flooded System Charging ..................................................................................................29
    4.2 REFRIGERANT HANDLING ....................................................................................................31

5 ELECTRICAL CONNECTIONS ........................................................................................................32
  5.1 GENERAL ELECTRICAL FIELD WIRING GUIDELINES .............................................................33
  5.2 ELECTRICAL SERVICE ...............................................................................................................33
  5.3 NAMEPLATE RATINGS .............................................................................................................34
  5.4 GROUNDING .............................................................................................................................34
  5.5 VOLTAGE TOLERANCE .............................................................................................................34
  5.6 STANDARD ELECTRICAL CONNECTIONS .............................................................................35
  5.7 CONTROLLERS ............................................................................................................................35
    5.7.1 Floor Mounted Units .........................................................................................................35
    5.7.2 Ceiling Mounted Units ......................................................................................................35
  5.8 AUXILIARY CONTROL WIRING ...............................................................................................36
  5.9 REMOTE SHUTDOWN .................................................................................................................37
  5.10 REMOTE ALARM CONTACTS .................................................................................................37
    5.10.1 Mini-dap4 Controller .......................................................................................................37
    5.10.2 dap4 Controller .................................................................................................................37
  5.11 REMOTE TEMPERATURE AND HUMIDITY SENSOR .............................................................38
  5.12 CONDENSATE PUMP (OPTIONAL) ..........................................................................................38
  5.13 CONDENSATE PROBE (STANDARD ON FLOOR UNITS AND OPTIONAL ON CEILING UNITS) .39
  5.14 FLOAT SWITCH (CEILING UNITS) ...........................................................................................39
  5.15 UNDER-FLOOR WATER DETECTION CABLE (OPTIONAL) .....................................................39
  5.16 DISCONNECT SWITCH (OPTIONAL) .........................................................................................39
  5.17 MANUAL OVERRIDE SWITCH BOARD (DAP4 ONLY) ............................................................40
  5.18 WIRING DIAGRAMS ................................................................................................................40
  5.19 PLUG FAN "NO AIRFLOW ALARM" CURRENT SENSING SWITCH (PLUG FAN UNIT ONLY) ....41
    5.19.1 "No Airflow" Switch Adjustment ....................................................................................41
6 IMPORTANT COMPONENTS ................................................................. 44

6.1 REMOTE HEAT EXCHANGER ............................................................ 44
6.2 REFRIGERATION COMPONENTS ....................................................... 44
  6.2.1 Expansion Valve .......................................................................... 44
  6.2.2 High Pressure Cutout Switch ....................................................... 44
  6.2.3 Low Pressure Cutout Switch ......................................................... 44
6.3 CONTROLS ....................................................................................... 44
  6.3.1 Mini-dap4 Controller (Ceiling Units) ............................................. 44
  6.3.2 dap4 Controller (Floor Units) ....................................................... 44

7 GENERAL MAINTENANCE REQUIREMENTS ....................................... 46

7.1 DAILY MAINTENANCE ...................................................................... 46
7.2 SCHEDULED MAINTENANCE ............................................................. 46
7.3 REMOVING DOORS AND PANELS FOR MAINTENANCE (FLOOR UNITS) .................................................................................. 47
7.4 ELECTRONICALLY COMMUTATED (EC) MOTORS (EC MOTORS) .... 48
  7.4.1 EC Plug Fan Manual Test (Units with a dap4 Controller Only) ...... 48
  7.4.2 Protective Features ....................................................................... 48
  7.4.3 EC Plug Fan Maintenance ............................................................. 49
7.5 UNITS WITH BELT DRIVEN BLOWERS ........................................... 49
  7.5.1 Belts ............................................................................................. 49
  7.5.2 Bearings ........................................................................................ 49
7.6 AIR FILTERS ..................................................................................... 50
  7.6.1 Upflow Unit Air Filter Replacement Procedure ......................... 50
  7.6.2 Ceiling Unit Air Filter Replacement Procedure ......................... 51
7.7 HUMIDIFIER ..................................................................................... 51
  7.7.1 Humidifier Cannisters ................................................................. 51
  7.7.2 Cylinder Spent Fault ................................................................. 51
  7.7.3 Replacement Cylinder ............................................................... 51
  7.7.4 Preparing Humidifier for Extended Shutdown Duration ............. 55
  7.7.5 Starting Humidifier after Extended Shutdown ............................ 55
7.8 HUMIDIFIER DRAIN PAN ................................................................. 56
7.9 CONDENSATE PUMP ....................................................................... 56
7.10 FUSES ........................................................................................... 56
7.11 REHEATING ELEMENTS ................................................................. 56
7.12 REFRIGERANT FILTER DRIER ....................................................... 56
7.13 CABINET ......................................................................................... 57
  7.13.1 Exterior Cabinet Maintenance- Cleaning .................................... 57
7.14 COILS ............................................................................................. 57
  7.14.1 Coil Cleaning ............................................................................. 57
7.15 PIPING ............................................................................................ 57
7.16 WATER/GLYCOL COOLED SYSTEM .............................................. 58
7.17 STANDARD WATER/GLYCOL FLOW SWITCH REPLACEMENT . 58
  7.17.1 Mounting the Flow Switch ......................................................... 59
7.18 DX COMPONENT REPAIR OR REPLACEMENT .......................... 59
7.18.1 Compressor Checklist ........................................................................................................60
7.18.2 Fixed Speed Scroll Compressor Replacement ......................................................................61
7.18.3 Refrigerant Filter Drier ........................................................................................................63
7.18.4 Thermostatic Expansion Valve (TXV) Replacement ...............................................................64
7.18.5 Refrigerant Liquid Line Solenoid Valve (LLSV) Replacement .................................................65
7.19 ELECTRICAL COMPONENT MAINTENANCE/REPLACEMENT .................................................66
7.20 ELECTRICAL CONTROL PANEL ..........................................................................................67
7.21 FUSES ...................................................................................................................................67
7.21.1 Fuse Replacement ................................................................................................................67
7.22 ELECTRIC REHEAT WITH MODULATING SCR CONTROL (SPECIAL OPTION) .........................68
7.22.1 Electric Reheat Element Checklist .......................................................................................68
7.23 RUN OR START CAPACITOR REPLACEMENT ........................................................................68
7.24 DEFINITE AND GENERAL PURPOSE CONTACTOR REPLACEMENT .......................................70
7.25 CONTROL AND ISOLATION TRANSFORMER REPLACEMENT ............................................70
7.26 PLUG FANS WITH ELECTRONICALLY COMMUTATED (EC) MOTORS (EC) ..................................71
7.27 SMOKE DETECTOR MAINTENANCE ..........................................................................................72
7.27.1 Smoke Detector Testing .......................................................................................................72
7.27.2 Cleaning Smoke Detector .....................................................................................................73
7.28 CONTROLS ...............................................................................................................................73
7.29 TEMPERATURE AND HUMIDITY SENSOR MAINTENANCE .....................................................74
7.29.1 Disposal of Temperature and Humidity Sensor ...................................................................74
7.30 MINI-DAP4 OR DAP4 CONTROLLER REPLACEMENT ..............................................................75

8 LOW AMBIENT RECEIVER PACKAGE .........................................................................................75
8.1 REFRIGERANT RECEIVER .......................................................................................................76
8.2 APPLICATIONS .........................................................................................................................76
8.3 SELECTION GUIDELINES ........................................................................................................76
8.4 SAFETY RELIEF DEVICES ......................................................................................................77
8.5 REFRIGERANT RECEIVER INSTALLATION ................................................................................77
8.6 HEAD PRESSURE CONTROL .....................................................................................................77
8.7 RECEIVER LEVELS ....................................................................................................................77
8.8 RECEIVER HEATERS ..................................................................................................................78
8.9 RECEIVER HEATER ELECTRICAL WIRING ..............................................................................78

9 GPOD ADDITIONAL FEATURES .................................................................................................79
9.1 DAY/NIGHT CONTROL .............................................................................................................79
9.2 CO₂ CONTROL ..........................................................................................................................79

10 WARRANTY POLICY ................................................................................................................80

11 CONTACT DATA AIRE ..............................................................................................................81

12 SUPERHEAT AND SUCTION PRESSURE TROUBLESHOOTING GUIDE ........................................82
12.1 LOW SUCTION PRESSURE AND HIGH SUPERHEAT ...................................................................82
12.2 HIGH SUCTION PRESSURE AND LOW SUPERHEAT .................................................................82
12.3 LOW SUCTION PRESSURE AND LOW SUPERHEAT ..................................................................82
Table of Figures

Figure 1 - Typical Lifting Method .................................................................................. 5
Figure 2 - Typical Clearance Near Walls ........................................................................ 5
Figure 3 - Example of a Suspended Cradle Type Mounting ............................................. 7
Figure 4 - Typical Discharge Line Check Valve ............................................................... 16
Figure 5 - Remote Condenser Above Evaporator ........................................................... 17
Figure 6 - Remote Condenser Below Evaporator ............................................................ 18
Figure 7 - Typical Water/Glycol System ........................................................................ 21
Figure 8 - Recommended Condensate Trap Dimensions ............................................... 23
Figure 9 - Typical Grounding Lug .................................................................................. 34
Figure 10 - Typical Remote Heat Exchanger Interconnection Points ............................... 36
Figure 11 - Typical Indoor Evaporator Interconnection Points ....................................... 37
Figure 12 - Typical Mini-dap4 Remote Alarm Contact Terminals ................................ 37
Figure 13 - Typical dap4 Remote Alarm Contact Terminals .......................................... 38
Figure 14 - Current Sensing Switch .............................................................................. 41
Figure 15 - CT Trip Adjustment and LEDs ................................................................... 42
Figure 16 - Door Top Section with Spring Hinge ............................................................ 47
Figure 17 - Typical Spring Latches ................................................................................ 48
Figure 18 - Typical Top of Humidifier Cylinder View ................................................... 52
Figure 19 - Typical Steam Humidifier .......................................................................... 53
Figure 20 - Typical Humidifier Drain Valve ................................................................. 54
Figure 21 - Typical Drain Valve Assembly .................................................................... 54
Figure 22 - Typical Receive Package Assembly ............................................................. 76
1 INTRODUCTION

1.1 Product Information - What is gPod?

The gPod is the indoor agriculture industry's first all-in-one true precision environmental control system. It provides consistent temperature, humidity, dehumidification, and CO₂ control for users to achieve successful yield after yield.

- Floor or ceiling configuration
- CO₂ control
- Light sensor
- Web-based control on any smart device
- Temperature and dehumidification control

For detailed control logic of the CO₂, light sensor, and Night/day scheduling, please see Mini-dap4 or dap4 IOM addendum section.

1.2 Model Identification Nomenclature

1.2.1 Ceiling Mounted Units

1.2.2 Floor Mounted Units
Condenser: (Condenser coil only, no compressor): The order write-up should have the condenser unit model number. Refer to applicable condenser model number identification.

Example: gPod unit, air cooled, upflow, 10-ton, 3 phase/230 volts, split system with outdoor condenser:

Evaporator model: GPAU-1032
Condenser model: GHRC-03932

1.3 Delivery Inspection

Data Aire equipment 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. Upon arrival of the unit and before unpacking it, verify that the labeled equipment matches the bill of lading.

NOTICE Document any external packaging damage or 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 display, disconnect switch handles, condensate pumps, spare belts, spare filters, etc. are packed inside the unit. Refer to the manila shipping tag located on the unit panel for details.

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

1.4 Paperwork

Each Data Aire unit ships with a startup 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 registration cards and other valuable paperwork, including a copy of this Installation, Operation and Maintenance manual.

A manila (yellow) tag is attached to the outside panel to indicate articles that may have been packaged and shipped loose within the unit cabinet. Typically, this would be a jack stands, condensate pump and other loose components that are not factory mounted.

WARNING It is the responsibility of the installing contractor to return the startup sheet and warranty registration card to Data Aire for proper activation of the unit warranty. Failure to do so may cause delays in replacement parts or Service support.
2 INSTALLATION

**CAUTION** Risk of handling heavy and lengthy parts, risk of top-heavy unit falling over, risk of sharp edges, splinters and exposed fasteners; can cause personal injury and equipment damage. Cabinet doors and panels can weigh more than 35lb. (15.9kg) therefore follow relevant OSHA lifting recommendations and consider using a two-person lift for safe and comfortable removal and installation of cabinet doors and panels.

**NOTICE** Only properly trained and qualified personnel wearing appropriate safety headgear, gloves and shoes should attempt to remove or install cabinet doors and panels.

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

2.1 Recommended Tools for Installation

- Wrenches – Common sizes
- Flat tip and Phillip screwdriver – Common sizes
- Wiring tools
- Brazing tools
- Multi-meter
- Pressure gauges – Sized for design pressure
- Electric hand tools
- Equipment handing
- Safety items
- Leveler

2.2 Pre-Installation

The unit you have received is specifically designed for indoor environmental control. This unit is designed and intended to be installed indoors in a conditioned space unless otherwise noted on the equipment serial name plate. Compare the data on the nameplate of the air-conditioning unit and other modules with the packing list and the order documents.

Backdraft dampers should be considered if multiple units are being installed with a common duct system. On floor units with plug fans, there is an AirSeal feature that will act as a virtual backdraft damper by running the fans at minimal speed. A damper or AirSeal will prevent cold air from flowing backwards through a unit that is offline or in standby.
2.2.1 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. All doors to the controlled space should be equipped with weather seals to prevent the infiltration of non-neutral conditioned air from external spaces. Failure to provide a vapor barrier can compromise the ability to control space conditions.

Reference: See the Mini-dap4 or dap4 Installation, Operating and Maintenance Manual (IOM) for allowable operating conditions and ranges.

Introduction of outside air into the space should be minimized. Outside air more than 5% of the total circulated air volume can have a significant effect on the overall space conditions and result in poor space control. All outside air that is introduced should be conditioned to the humidity and temperature parameters of the environmental control unit set points to maintain proper room conditions and to prevent the units from running excessively to maintain the room’s conditions.

For floor units, verify that the floor is level and solid enough to support the unit.

The equipment must be level to operate properly and prevent damage to the internal components. Shimming and/or grouting may be necessary. This is to ensure the unit base is on a perfectly flat plane.

For ceiling units, verify the unit is level or slightly pitched towards the condensate drain, solid, and supported. It is recommended that support is structurally engineered to prevent flexing, sagging or twisting. Do not obstruct door operation, filter access, piping, electrical controller enclosure or control connections with suspension members.

For all units, avoid the transfer of vibrations to the mounting materials which may cause audible noise.

2.3 Locating Floor Units

Move the unit in its upright position to the installation site. It is recommended that the unit be protected from damage to the doors during any storage or moving. Removal of the doors is easily accomplished using the spring-loaded upper hinge and lifting the fixed lower hinge pin on the bottom of the door up and out of the lower hinge plate. The doors may be removed without moving the 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. If necessary, remove the doors prior to lifting the unit.
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.

**WARNING** Improper lifting or moving of equipment may result in damage to doors, panels or frame members.

When installing the unit, enough 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 36” or 40”, depending on the unit, 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 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, distributing the cold air as close to 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.

**NOTICE** 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, chilled water and/or hot water. Installation of units above equipment that could sustain water damage should be avoided.

### 2.3.1 Upflow Units

All floor mounted gPods have an upflow configuration. Upflow units will typically be supported by vibration isolation pads and/or floor stands which 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 Electronically Commutated (EC) motors and “plug fans”. Fan speed is factory set based on order. Fan speed can be changed in 1% increments through the unit’s microprocessor controller, Data Alarm Processor 4 (dap4). Other fan speed control options are available, and some require optional hardware to facilitate the optional control. See the dap4 operation manual for details and recommended settings.

**Locating Ceiling Units**

The unit is intended for above the ceiling installation and is typically suspended from structural members in the building above the ceiling. The Design Engineer must determine the necessary strength of the supporting structures and follow national and local building codes.

Appropriate service access above the ceiling is required around all service and electrical access panels. There must be unobstructed clearance below the unit allowing ladder access to enable routine maintenance and service. Consult local building codes and National Electric Code for special installation requirements.

**NOTICE** There are many available unit configurations for ceiling mounted gPods. Be sure to identify the unit type and style before installing. For instance, there may be split condenser sections requiring separate or shared power.

**NOTICE** Condensation formation and frequent humidifier flushing (when humidifier is installed) are normal functions of this equipment. Drain connections must be made to ensure proper water removal. Unit will require drain connections for condensate removal and water connections possibly for humidifier (when installed) makeup water, condenser water, chilled water and/or hot water. Installation of units above equipment that could sustain water damage should be avoided.
2.3.2 Horizontal Airflow Units

All ceiling mounted gPod units have horizontal airflow configuration. Field supplied, and installed ductwork is intended to be connected to the factory provided duct collars on the supply and return air openings.

Ceiling units are shipped with a drive packages pre-set at the factory to overcome approximately 0.5" WC external static pressure. But the blower speed may need to be re-adjusted in the field for actual site and space conditions.

There are various options to allow mounting of ceiling units. These must be pre-determined by the Design Engineer based on site conditions and available installation options. One method is to hang the ceiling mounted units by means of a cradle type installation. This method requires four (4) field supplied threaded hanging support rods which must be securely attached to the building structure and two (2) field provided lower support channels connected to the pairs of threaded hanging support rods. An appropriate lifting device must be used to raise the evaporator section into place before attaching to the mounting system. Use caution and appropriate safety methods when making such a lift. Attaching hardware such as washers, nuts and jam nuts are also field supplied to secure the mounting system to each threaded rod. Tighten the nuts so the weight is supported evenly by the four rods and the unit is level or slightly pitched towards the location of condensate drain.

*Figure 3 - Example of a Suspended Cradle Type Mounting*
2.3.3 Indoor Condensers

Smaller air-cooled units (2.5 to 5-ton) are available with either an indoor condenser section or an outdoor condenser. While most air-cooled units have outdoor condensers, indoor condensers are occasionally used. The indoor condenser sections are to be mounted in a similar manner as the evaporator sections. Indoor air-cooled condensers have factory provided duct collars on the supply and intake air openings as appropriate to allow connection of the field supplied duct systems.

Typical installations have the indoor or outdoor condenser near or adjacent to the evaporator section especially when shared electrical power is required. The same service and maintenance requirements apply to these units as well.

2.4 Storage

**NOTICE (Important)** This storage section is not intended to be a comprehensive guide for all possible issues associated with construction conditions, construction stage, and indoor environment, how interior spaces are maintained and other factors affecting the equipment storage. Each installation is unique.

Short-term storage is considered 60 days or less from shipment date. Long-term storage is considered any period beyond 60 days from date of shipment. It is mandatory that a detailed record be maintained during this long-term period, such as, but not limited to: proper sealing of the cabinet, rotation of the blowers and bearings, and protection of all motors from moisture. Check the fan rotation monthly, the fan and motor should be rotated several times to replenish the bearing surfaces with fresh grease as needed and to prevent flat spots of the fan shaft. The fan impeller should be left at approximately 180° from that of the previous month to prevent the belts from taking a set position.
It will be the responsibility of the customer to submit a monthly log sheet showing the condition of the unit and noting any discrepancies. A copy of the log sheet should be sent to Data Aire. Failure to perform the long-term storage requirements may void the warranty.

2.4.1 Suggested Reference Storage Room Conditions

This information is provided for reference and guidance purposes only.

- Dry bulb temperature range: 65°F to 85°F
- Effects of high temperatures may dry out components or may damage electrical components.
- Effects of low temperatures may cause freezing damage to coil, compressor, system components, electrical components, etc. Freezing temperatures must be avoided.
- Humidity range: 25 to 50% RH
- High humidity may cause damage to insulation and electrical components. Storage in moist air, above 50%, should be avoided. High humidity may cause rust on metal components such as sheave, pulley, blower housing, cabinet parts, supports, etc.
- Low Humidity may cause brittle conditions to components within the unit. At low humidity, problems of brittleness or electrical static might arise for the equipment.
- Level with floor.
- Units with compressor maximum tilt angle is 30° (compressor not running) but recommend the unit be set level for 24 hours prior to final installation.
- Store at non-condensing temperature and humidity conditions.

2.4.2 General Storage Considerations

- All equipment shall be stored for safety of occupants. Per OSHA codes and codes applicable to your installation.
- Maintain clearance from working space and traffic areas.
- Our indoor products are not designed or intended to be stored outdoors or exposed to outdoor conditions.
- Components sealed in plastic shrink-wrap are not exempt from this requirement. Moisture will collect inside the plastic, resulting in corrosion of the cabinet, the electronic components and or other water sensitive components.
- Provide proper fire protection per local and national codes.
- Protect from all water or fluid sources. Equipment should be protected from possible water damage, such as from leaks, fire-sprinkler discharge, and flooding.
- The storage space should be filtered to remove dust, cleansed of gaseous contaminants, if present, and controlled to the desired relative humidity and temperature.
- Isolate this equipment from pressure testing of water, steam, gas and air piping.
- Isolate this equipment from temporary building power.
- The unit must also be protected from damage to the exterior of the cabinet or coil connections by construction vehicles and personnel.
- Isolate from vibration sources.
- Isolate from direct sun light.
- Isolate from storage of hazardous materials and substances.
- Refrigerant coils have been evacuated and pre-charged with slight nitrogen holding charge. DO NOT damage or disturb these coils and connections.
- Water coils must have all inlet and outlet connections capped or closed tight to prevent foreign materials and liquids from gaining entrance during the storage period.

2.5 Field Piping Connections Installation

When brazing, a supply of dry nitrogen gas needs to be fed through the refrigerant lines. Be sure to open the other end of the refrigerant line to allow the nitrogen to bleed off and not pressurize the piping (Recommended pressure 3PSI – 5PSI). Nitrogen needs to be flowing through the lines to eliminate carbon deposit build-up on the inside of the joints. Carbon could contaminate the refrigerant and restrict the metering device. No soft soldering allowed.

Properly de-burr pipe ends with a tubing reamer. Ensure pipe end and inside surface of piping is clean before brazing.

Use a silver/phosphorus/copper alloy with 15% silver for brazing coper to coper. Use flux and 45% silver or higher when brazing copper to brass or other metals. Limit the flux to the minimum required to prevent contamination of the joint internally. Flux only the male portion of the connection, never the female. After brazing, remove excess flux.

All refrigeration piping materials are subject to changes in temperature and will expand and contract with temperature change. Installation techniques must allow for expansion and contraction changes for piping connections, this will prevent stresses which may buckle and rupture the copper piping or joints.

During the installation, the lines should be capped off and filled with dry nitrogen at the end of each day’s work or until the system is completed and sealed.

2.6 Electrical Installation

**NOTICE.** All Electrical penetrations to the unit should be air leak tight to prevent infiltration into the cabinet.

The field power and control wiring should enter the unit cabinet and electrical control panel in the areas provided on the unit. If these openings do not work as provided, the electrical contractor must determine a more appropriate area (in accordance with NEC and/or local code) for these opening and manually make the opening in the sheet metal cabinet and/or electrical control panel. Connect the line power source to the input terminal block or optional disconnect switch. The wiring diagram for each unit is located on the inside of the electrical panel door.

All field wiring should be done in a professional manner and in accordance with all governing codes. Before operating unit, double check all wiring connections, including the factory terminals. Factory connections can vibrate loose during shipment.

Installation of the optional remote temperature and humidity sensors should not be placed where they will be directly affected by other equipment which gives off heat or moisture. Prevent exposure to direct sunlight.

2.7 Refrigeration Setup

**WARNING** Before carrying out the pressure test, precautions must be taken to evacuate all personnel from the area of risk and post notices advising that the system or equipment is under pressure.
2.7.1 Leak Test

**NOTICE** No installation is complete until the entire system has been thoroughly checked for leaks. This includes checking the refrigerant tubing, flare fittings, pressure controls, Schrader fittings and compressor roto-lock service valves. Check both the field and factory connections.

In addition to the refrigeration system, check all condenser water lines, humidifier water makeup lines, condensate lines, condensate pumps, chilled water lines, centrifugal pumps and fluid cooler (where applicable).

When handling or recovering 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.

Pressurize the systems circuit(s) to 150 PSIG (1034 kPa) using dry nitrogen with a trace of refrigerant. Check the entire system for leaks with a suitable leak finder (per local code) including but not limited to all braze joints, caps, fittings, and flare nuts on both field and factory furnished components. After completion of leak testing release test pressure and pull a vacuum on the system.

**NOTICE** Because fitting may loosen during transit, tightening of fittings and valves is the responsibility of the installing contractor during the installation process.

**NOTICE** With any fluid connection there is risk of leakage. Water leakage could result in property damage to mission critical equipment. A water drain connection is required. Units with optional steam generator humidifiers will require an external potable water supply. Water leakage can result from improper installation and/or practices.

2.8 System Control Setup

Set the dap4 or Mini-dap4 (or thermostat for ceiling units) to the required site specifications so the unit may operate properly. Adjust the dap4 settings to the required application design conditions. When making these settings and adjustments, constantly check whether the system is operating normally (pressure, etc.). See dap4 User Manual for details.

2.9 Post Installation

Before leaving the installation site:

- Carry out a general installation inspection regarding cleanliness, noise and leak detection.
- Be sure to observe the applicable law on waste removal when disposing any hazardous materials.
- Dispose of all packaging materials in accordance with regionally applicable regulations.
- Confirm there are no obstructions within the clearance area.
- Check all unit electrical and pressure ratings to be within the ratings on the serial name plate.

2.10 Installation of Remote Heat Exchanger

Air-cooled condensers and fluid coolers have individual Installation, Operation and Maintenance manuals which should be referred to for more complete details.

2.11 Voltage Phase Check

2.11.1 Evaporator Power Phasing

The correct voltage phasing for the scroll compressors and forward-curved centrifugal blowers must be checked. Both components are phase dependent and although our units are factory run tested, it is important to make sure the rotation of these motors are correct in the field. A quick and easy way to check the scroll compressor rotation on the evaporator section is to momentarily energize the COOL 1 manual switches on the Manual Override Switch Board located next to the dap4 controller or use compressor Manual control Mode in menu I if using the Mini-dap4 controller. Observe the compressor operation for a short period of time then slide the switch back to the OFF position. An out of phase compressor will draw relatively low amps and both suction and discharge pressures will remain nearly equal. Reverse any two of the three-line voltage wires at the line voltage field connection point to change the compressor rotation which also changes the rotation of any other phase sensitive components within the evaporator.

![NOTICE] The floor mounted gPod units include backward curve plenum fans with electronically commutated (EC) motor as a standard feature. The EC motors are phase independent therefore the plenum fan rotation will always be in the correct direction.

![NOTICE] Units shipped from the factory are run tested ensuring compressor rotation is consistent with the evaporator fan motor. However, a field change-out of the compressor may require checking proper phase.

2.11.2 Remote Heat Exchanger

The gForce remote heat exchanger (GHRC) (air cooled or dry coolers) are three phase and the individual axial fans with electronically commutated (EC) motors are three phase and will only run in one direction. Check operation by
placing a momentary jumper across low voltage terminals which will energize the control circuit. Check the wiring diagram for the terminal numbers to jumper across. This will energize the control circuit.

If an optional remote heat exchanger (DARC) (air cooled or dry coolers) is ordered it can be either single or three-phase, but the individual Permanent-Split Capacitor PSC fan motors are single phase and will only run in one direction. Check the operation of the fans by placing a momentary jumper across the low voltage field terminals. Check the wiring diagram for the terminal numbers to jumper across. This will energize the control circuit.

| NOTICE | Disconnect pumps on glycol systems unless already filled with water/glycol solution. |

The remote heat exchanger fans may not run because the evaporator section has not reached the required cut-in head pressure for air-cooled units or the thermostat set-point is above the current ambient or water temperature.

Please see the Air-Cooled Condenser or Fluid Cooler User Manuals for more detailed information regarding the remote heat exchangers.

3 Piping

Piping design should comply with required codes, law and regulations that apply at the site of the installation.

Examples:
- Mechanical Refrigeration Code CSA B52
- Building Code
- Plumbing Code
- ASHRAE 15
- Municipal / City / State / Provincial Codes / National / International

3.1 Refrigerant Piping

| NOTICE | The American refrigeration industry uses different copper pipe called ACR (air conditioning and refrigeration field services) pipe, which is sized directly by its outside diameter (OD) and a type letter indicating wall thickness. ACR pipe is manufactured without processing oils that would be incompatible with the oils used to lubricate the compressors in the HVAC system. |

- All refrigerant piping should be Air Conditioning Refrigeration (ACR) hard drawn copper tube, unless otherwise specified. Soft copper tubing is unacceptable.
- Copper tubing intended for air conditioning refrigeration applications must be dehydrated, charged with nitrogen, and plugged by the manufacturer.
- The nominal size is based on the outside diameter (OD).
- All refrigerant piping should be installed with high temperature brazed joints. When brazing refrigerant lines, an inert gas should be passed through the line at low pressure to prevent scaling and oxidation inside the tubing. Dry nitrogen is preferred. No soldering allowed. Refer to ANSI/AWS standards A5.8, A5.31, B2.2 and or C3.4 for brazing guidance and reference.
• Do not leave dehydrated piping or components open to atmosphere any longer than is required. Keep piping clean and dry, especially on units with R-410A refrigerant.

• Piping should be designed with adequate three-dimensional flexibility. It should not be in contact with the surrounding structure unless a proper tubing mount has been installed. This protection proves necessary to avoid excess vibration, which can ultimately result in connection or tube failure due to fatigue or wear from abrasion. Aside from tubing and connection damage, excess vibration may be transmitted to the surrounding structure and generate an unacceptable noise level within the structure as well. Units should be installed with proper piping devices (supporting saddles, etc.). Care must be taken in isolating the refrigerant tubing from the building. Vibration isolation support is recommended. Avoid piping runs through noise-sensitive areas, such as office walls and conference rooms.

• Standard refrigeration practices should be followed for leak testing, evacuation and refrigerant charging of the refrigerant circuit.

• Based on ASHRAE's Refrigeration Handbook, a properly designed and installed refrigerant piping system should:
  o Provide adequate refrigerant flow to the evaporators, using practical refrigerant line sizes that limit pressure drop
  o Avoid trapping excessive oil so that the compressor has enough oil to operate properly at all times
  o Avoid liquid refrigerant slugging
  o Be clean and dry

• The interconnecting lines require installation by a qualified refrigeration mechanic.

• Good refrigeration piping design requires that the refrigeration lines be pitched in the direction of flow at approximately 1/2 inch (12.7 mm) per 10 feet (3.1 m) or 1 inch (25 mm) per 20 feet (6.1 m).

• ASHRAE Standard 15 and ASME Standard B31.5 should be used as guides for safe practice because they are the basis of most municipal and state codes. However, some ordinances require heavier piping and other features. The designer or engineer should know the specific requirements of the installation site.

• Ensure that the pipe surfaces to be brazed are clean and that all burrs have been removed from the ends of the pipes. Ensure that all loose material has been cleaned from inside the pipe before brazing.

• Proper piping practices should be employed to ensure adequate oil return, even under minimum load conditions with special consideration given to the size and proper slope of the tubing coming from the evaporator. Tubing returns from the evaporator should be designed so as not to trap oil and to prevent oil and refrigerant migration back to the compressor during off-cycles.

• Refer to the line size refrigerant piping chart for a guideline for sizing refrigerant lines. The ultimate responsibility for line sizing is that of the installing contractor or project engineer. Data Aire does not assume this responsibility.

• Refer to the ASHRAE Refrigeration Handbook for general, good-practice refrigeration piping.

• All piping below the raised floor must be located so that it does not restrict airflow. Plan the piping layout under the raised floor, if applicable, to prevent the airflow from being blocked. When installing piping on the subfloor, it is recommended that the pipes be mounted in a horizontal plane rather than stacked one above the other. Whenever possible, the pipes should be run parallel to the airflow.

• When installing the condenser below the evaporator section the vertical rise between the condenser and evaporator section should not exceed 15 feet. When liquid lift is higher than 15 feet, there is a possibility
of creating flash gas at the top of the riser because of the increased pressure drop. This can cause stress on the TXV and evaporator coil and shorten compressor life span. The system will also lose capacity and increase operating cost.

3.2 Split Air-Cooled Unit Piping

Air-cooled unit piping is crimped and brazed closed from the factory and contains a nitrogen holding charge. Each installation requires field-supplied refrigerant piping to a condenser.

Refer to the attached line sizing chart in section 3.3 for a guideline for sizing refrigerant lines. The ultimate responsibility for line sizing selection is that of the installing contractor or the project engineer. Data Aire does not assume this responsibility. The chart covers distances up to 200 equivalent feet. For installations greater than this distance, consult ASHRAE or similar references.

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

Do not vent the nitrogen until all refrigerant piping is in place, ready for connection to the evaporator and condenser. The discharge, suction and liquid lines need to be refrigerant grade copper and in accordance with local code. All refrigeration piping should be installed with high temperature brazed joints. Data Aire recommends a silver/phosphorus/copper alloy with 5 to 15% silver be used to braze the refrigerant line sets to the indoor and outdoor units. Nitrogen needs to be flowing through the lines to eliminate carbon deposit build-up on the inside of the joints. Carbon could contaminate the refrigerant and restrict the metering device. Be sure to open the other end of the refrigerant line to allow the nitrogen to bleed off and not pressurize the piping. Pre-vailing good refrigeration practices should be employed for piping support, leak testing, dehydration and charging the refrigerant circuits. During the installation, the lines should be capped off and filled with dry nitrogen at the end of each day’s work or until the system is completed and sealed.

3.2.1 Discharge Lines

Discharge lines, also called hot gas lines, should be trapped at the top (inverted) and bottom as well as every 15 to 20 feet of vertical rise. Discharge check valves (field provided) are required on all installations, especially those where there are long pipe runs or cold climates. For air cooled units built after 3/14/2017, the discharge check valves are already included internal to the evaporator section and do not need to be installed in the external pipe runs to the unit. For units built before this date, the check valves must be field supplied and installed externally to the evaporator section. If there is doubt as to whether the check valve is already included with the unit, look for the check valve on the hot gas line near to point where this line exits the unit (see example picture below). The externally installed check valve should be placed no less than six (6) to ten (10) feet (1.8 to 3.1 m) from the compressor.
Note: Figure 4 - Typical Discharge Line Check Valve is only intended to show an example of a common check valve. This picture may not represent your specific unit, check valve size, location or orientation.

Discharge line pressure should not exceed 9 PSI for R-410A. Recommended gas velocity for proper oil return is 1,000 FPM. Slope horizontal lines downward in the direction of the refrigerant flow (1/2” for every ten feet of line length). Discharge lines do not require insulation but due to the high temperatures of the refrigerant inside the line, the pipes may be insulated to protect against burns to individuals near or around the lines. They should be insulated if the heat dissipated is objectionable or to prevent injury from high-temperature surfaces. In the latter case, it is not essential to provide insulation with a tight vapor seal because moisture condensation is not a problem unless the line is located outside. External field piping must be supported within 18” of the inlet and outlet connections.

3.2.2 Liquid Lines

Liquid line size is determined by the recommended allowable pressure drop and velocity. The liquid line pressure drop is 9 PSI for R-410A. The recommended liquid velocity should be below 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 fifteen (15) feet below the evaporator is not recommended. Insulation of liquid lines is not required but can be useful in preventing condensation from forming and to avoid flashing on long pipe runs. Although the liquid line ordinarily does not require insulation, the liquid line should be insulated to minimize heat gain when it passes through a warmer area.

3.2.3 Line Traps:

Line traps assist with vertical oil travel and proper oil return. In a gaseous state, the refrigerant is a poor carrier of oil therefore oil will begin to fall back down with vertical rises greater than 20 feet therefore, discharge line trapping is required.

- Discharge (hot gas) Line Traps:
  1. Traps must be installed by the installing contractor on the vertical rise of the discharge line.
2. For vertical rises, the installing contractor must install a trap at the bottom of the vertical rise and no greater than 5 feet horizontal distance from the compressor discharge connection of the evaporator section.

3. For vertical rises greater than 20 feet, the installing contractor must install mid-rise trap(s) every 15 feet or evenly spaced points along the vertical lift.

4. An inverted trap is required at the top of the vertical rise and no greater than 3 feet horizontal distance from the condenser coil. The inverted trap must extend a 7-1/2” above the bottom of the condenser coil.

- Liquid lines do not require traps.
- See Figure 5 - Remote Condenser Above Evaporator for typical trapping requirement for each refrigerant circuit.

3.2.4 Field Piping, Remote Condenser Above Evaporator

*Figure 5 - Remote Condenser Above Evaporator*

**NOTES:**

1. This is the recommended piping. All piping to be per local and/or state code.
2. Condenser to be no more than 60 feet above evaporator.
3. For units built after April 2017, the check valves are included internally in the evaporator section.
4. Slope horizontal lines downwards in the direction of the refrigerant flow. 1/8” for every 10 feet of line length.
5. Inverted trap to extend 7-1/2” above the bottom of the condenser coil.
3.2.5 Field Piping, Remote Condenser Below Evaporator

Figure 6 - Remote Condenser Below Evaporator

NOTES:
1. THIS IS THE RECOMMENDED PIPING. ALL PIPING TO BE PER LOCAL AND/OR STATE CODE.
2. CONDENSER TO BE NO MORE THAN 35 FEET BELOW EVAPORATOR.
3. SLOPE Horizontal LINES DOWNWARD IN THE DIRECTION OF THE REFRIGERANT FLOW. 1/" FOR EVERY 10 FEET OF LINE LENGTH.
4. INVERTED TRAP NEEDED ON SUCTION LINE WHEN COMPRESSOR IS OUTDOORS ONLY.

3.2.6 Connection Sizes, Air-Cooled Units

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Hot Gas/Discharge Line</th>
<th>Liquid Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPAX-2.5</td>
<td>1/2” O.D.</td>
<td>1/2” O.D.</td>
</tr>
<tr>
<td>GPAX-03</td>
<td>1/2” O.D.</td>
<td>1/2” O.D.</td>
</tr>
<tr>
<td>GPAX-04</td>
<td>1/2” O.D.</td>
<td>1/2” O.D.</td>
</tr>
<tr>
<td>GPAX-05</td>
<td>1/2” O.D.</td>
<td>1/2” O.D.</td>
</tr>
<tr>
<td>GPAX-06</td>
<td>5/8” O.D.</td>
<td>5/8” O.D.</td>
</tr>
<tr>
<td>GPAX-08</td>
<td>5/8” O.D.</td>
<td>3/4” O.D.</td>
</tr>
<tr>
<td>GPAX-10</td>
<td>5/8” O.D.</td>
<td>3/4” O.D.</td>
</tr>
<tr>
<td>GPAX-13</td>
<td>7/8” O.D.</td>
<td>7/8” O.D.</td>
</tr>
</tbody>
</table>
### FLOOR MOUNTED UNITS

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Hot Gas/Discharge Line</th>
<th>Liquid Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPAU-05</td>
<td>1/2” O.D.</td>
<td>1/2” O.D.</td>
</tr>
<tr>
<td>GPAU-08</td>
<td>5/8” O.D.</td>
<td>5/8” O.D.</td>
</tr>
<tr>
<td>GPAU-10</td>
<td>5/8” O.D.</td>
<td>5/8” O.D.</td>
</tr>
<tr>
<td>GPAU-13</td>
<td>5/8” O.D.</td>
<td>5/8” O.D.</td>
</tr>
</tbody>
</table>

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 sizes will vary significantly.

3.3 Recommended Line Sizing for Air-Cooled Split Systems

3.3.1 Hot Gas Lines: Single Circuit Units (Up to 200 Equivalent Feet)

<table>
<thead>
<tr>
<th>Unit Tonnage</th>
<th>Equivalent Feet (Meters)</th>
<th>Hot Gas Lines (Single Circuit Systems)</th>
<th>50 (15.2 m)</th>
<th>100 ft (30.5 m)</th>
<th>150 ft (45.7 m)</th>
<th>200 ft (61.0 m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
</tr>
<tr>
<td>3</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
</tr>
<tr>
<td>4</td>
<td>7/8”</td>
<td>5/8”</td>
<td>7/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>7/8”</td>
</tr>
<tr>
<td>5</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
</tr>
<tr>
<td>8</td>
<td>7/8”</td>
<td>7/8”</td>
<td>1-1/8”</td>
<td>7/8”</td>
<td>1-1/8”</td>
<td>7/8”</td>
</tr>
<tr>
<td>10</td>
<td>1-1/8”</td>
<td>7/8”</td>
<td>1-1/8”</td>
<td>7/8”</td>
<td>1-1/8”</td>
<td>7/8”</td>
</tr>
<tr>
<td>13</td>
<td>1-1/8”</td>
<td>1-1/8”</td>
<td>1-1/8”</td>
<td>1-1/8”</td>
<td>1-1/8”</td>
<td>1-1/8”</td>
</tr>
</tbody>
</table>

3.3.2 Liquid Lines: Single Circuit Units (Up to 200 Equivalent Feet)

<table>
<thead>
<tr>
<th>Unit Tonnage</th>
<th>Equivalent Feet (Meters)</th>
<th>Liquid Lines (Single Circuit Systems)</th>
<th>50 (15.2 m)</th>
<th>100 ft (30.5 m)</th>
<th>150 ft (45.7 m)</th>
<th>200 ft (61.0 m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>3/8”</td>
<td>1/2”</td>
<td>1/2”</td>
<td>1/2”</td>
<td>1/2”</td>
<td>1/2”</td>
</tr>
<tr>
<td>3</td>
<td>1/2”</td>
<td>1/2”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
</tr>
<tr>
<td>4</td>
<td>1/2”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
</tr>
<tr>
<td>5</td>
<td>1/2”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>5/8”</td>
</tr>
<tr>
<td>8</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
</tr>
<tr>
<td>10</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
</tr>
<tr>
<td>13</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
<td>7/8”</td>
</tr>
</tbody>
</table>

**NOTE 1:** If equivalent piping length falls between two columns above, choose the longer.

**NOTE 2:** If hot gas line refrigerant flow is upward use, "VERTICAL UP", if it is horizontal or downward, use "HORIZ. & VERTICAL DOWN".
3.3.3 Total Equivalent Line Length Calculation

1. The “equivalent line length” is the sum of the straight length portions of the refrigerant line plus losses in equivalent length from 45° and 90° bends and fittings. Add the total straight (lineal) length of tubing to the equivalent length of fittings, elbows and bends to get total equivalent length.

\[
\text{Total Equivalent Line Length} = \text{Length}_{\text{Horizontal}} + \text{Length}_{\text{Vertical}} + \text{Losses from bends} + \text{Losses from fittings}
\]

2. The total equivalent line length is then used to determine the refrigerant line sizes from the recommended line sizing charts.

3.4 Post Piping Installation

After interconnecting piping is installed, the piping system must be cleaned. If solvents/cleaning solutions are used, ensure they are completely flushed from the piping before connecting it to the unit. Failure to do so will result in equipment problems.

3.5 Water/Glycol Cooling Unit Piping

Water/Glycol-cooled units are factory-charged and tested. Field-supplied and field-installed piping is required from the unit to building water or tower water sources or the fluid cooler (i.e., dry cooler) and pump package. Pipe size will depend on length of run and the maximum water flow required. The Engineer of Record or Design Engineer is responsible to determine piping sizes based on the installation site conditions.

The required field installed fluid cooler pipe sizes may or may not be the same as the connection sizes on the fluid cooler. Refer to the Fluid Cooler Installation, Operation and Maintenance manual for connection sizing). The pipe size will depend on the length of pipe and the calculated pressure drop of peripheral components.

Shutoff valves, field provided, 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. There should be a means of draining the unit for service. Field supplied drain/fill valves should be located at the lowest point on the connected piping.

Water/glycol cooled units are normally shipped with plate/fin heat exchangers as standard equipment. A strainer is shipped loose (factory provided) and is to be field installed in the supply line with shut-off valves before and after the strainer. The strainers and water/glycol piping must be cleaned on a periodic basis. If the unit is shipped with optional a co-axial or shell and tube condenser, strainers are not required nor shipped with the unit.

All water pipes have a temporary cap installed on the end of the pipe for pressure testing the fluid system. These temporary caps must be removed before installing the piping to the units. Use a tube cutter for smaller pipes and a reciprocating saw with a metal cutting blade for larger pipe sizes or if there is a clearance problem. All connections need to be cleaned before connections are brazed together.

**NOTICE** 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 the piping system to purge the air.

Water/Glycol cooled system piping may include a centrifugal pump (or pumps for redundancy) available from Data Aire as an option. Union(s), shutoff valves, and check valve(s) are field provided. A flow switch can be provided by Data Aire as an option. Pumps must be primed before operating per the pump manufacturer’s guidelines.
3.5.1 Field Piping, Water/Glycol System

*Figure 7 - Typical Water/Glycol System*

**NOTES:**

1. **FIELD PIPING**
   - **EXPANSION TANK**
   - **REMOTE FLUID COOLER**
   - **CENTERIFUGAL PUMP**
   - **UNION**
   - **FLOW SWITCH**
   - **TXV**
   - **CONDENSER**
   - **COMPRESSOR**
   - **EVAPORATOR COIL**
   - **INDOOR EVAPORATOR**

- The Expansion Tank is a required component of a proper system installation. The tank can be provided by Data Aire.
- All Water/Glycol field piping must be designed and installed in accordance with ASHRAE standards and local codes.
- Centrifugal pumps and components are optional. Flow switch required with dual pumps, otherwise optional.
3.5.2 Connection Sizes, Water/Glycol Cooled Units

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Water In</th>
<th>Water Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPAX-2.5</td>
<td>3/4” O.D.</td>
<td>3/4” O.D.</td>
</tr>
<tr>
<td>GPAX-03</td>
<td>3/4” O.D.</td>
<td>3/4” O.D.</td>
</tr>
<tr>
<td>GPAX-04</td>
<td>1-1/8” O.D.</td>
<td>1-1/8” O.D.</td>
</tr>
<tr>
<td>GPAX-05</td>
<td>1-1/8” O.D.</td>
<td>1-1/8” O.D.</td>
</tr>
<tr>
<td>GPAX-06</td>
<td>1-5/8” O.D.</td>
<td>1-5/8” O.D.</td>
</tr>
<tr>
<td>GPAX-08</td>
<td>1-5/8” O.D.</td>
<td>1-5/8” O.D.</td>
</tr>
<tr>
<td>GPAX-10</td>
<td>1-5/8” O.D.</td>
<td>1-5/8” O.D.</td>
</tr>
<tr>
<td>GPAX-13</td>
<td>1-5/8” O.D.</td>
<td>1-5/8” O.D.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Water In</th>
<th>Water Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPAU-05</td>
<td>1-1/8” O.D.</td>
<td>1-1/8” O.D.</td>
</tr>
<tr>
<td>GPAU-08</td>
<td>1-5/8” O.D.</td>
<td>1-5/8” O.D.</td>
</tr>
<tr>
<td>GPAU-10</td>
<td>1-5/8” O.D.</td>
<td>1-5/8” O.D.</td>
</tr>
<tr>
<td>GPAU-13</td>
<td>1-5/8” O.D.</td>
<td>1-5/8” O.D.</td>
</tr>
</tbody>
</table>

3.6 CO₂ Piping

For units with CO₂ control, there is a 3/8” copper line connection to be used with an external CO₂ source. This external CO₂ supply is to be regulated to 50 PSIG is as the maximum allowable supply pressure prior to entering the unit. Higher pressures could result in valve malfunction or failure.

The CO₂ option includes a solenoid valve and CO₂ sensor. For CO₂ control logic, see dap4 IOM addendum section.

3.7 Condensate Drain Piping

To properly drain the condensate from the evaporator condensate pan, the evaporator section is equipped with a 3/4” FPT connection on the bottom of the unit for condensate removal. The following are recommendations for condensate drain systems:

1. Do not reduce the size of the condensate drain piping.
2. The condensate drain piping must be run to an unrestricted waste line and must be protected from freezing.
3. In high humidity conditions, it is recommended to insulate the condensate drain line to prevent condensation forming on the exterior of the piping.
4. It is recommended that a union (field supplied) be installed at the ¾” FPT connection to permit easy disassembly of the condensate drain piping from the unit for cleaning.
5. Drain lines should be pitched downward not less than 1/4” for each ten (10) feet of horizontal run.
6. Where local codes permit, PVC pipe may be used.
7. Ceiling units with an optional vertical discharge have a 5” plenum below the evaporator drain pan. The plenum has knockouts that allow routing of the field supplied and installed condensate drain piping system. The drain line can be routed out either side of these units.
3.7.1 Condensate Trap

Probably the most misunderstood portion of a condensate drain system is trap installation. The primary purpose of a condensate trap is to prevent air from being drawn back into the unit during operation. Traps must be installed in a manner that will stop the air from passing through, but still allow the condensate to drain from the condensate pan.

Therefore, a factory supplied trap (field installed on ceiling units and factory installed of floor units) must be installed into the ceiling unit drain system external of the evaporator section. To eliminate air trapping, an air vent must be used to allow air to exit. Venting the drain after the first trap is recommended.

Figure 8 - Recommended Condensate Trap Dimensions shows the recommended dimensions for fabricating a proper trap, when required to be field fabricated:

![Figure 8 - Recommended Condensate Trap Dimensions](image)

Notes:

1. This trap is capable of handling static pressures equal to 4” H2O which is the maximum static available for ceiling units. If the unit fans are standard, there is no need to consider different dimensions but if higher total static pressure is expected, more vertical drop is required.

2. 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 with the side mounting kit option or shipped loose. Factory mounted condensate pumps do not require a separate power source.

3. Condensate pumps that ship loose or are field provided, typically require a dedicated 110-volt power source. Field pipe connections must be made to the pump discharge connection. A check valve (field supplied?) must be installed to prevent short cycling. Pumps must be located below the condensate drain pan level.
NOTICE 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.

Do not expose drain line to freezing temperatures. Drain line may contain boiling water therefore use copper or other suitable material. Drain line must comply with local building codes. It is recommended to install under-floor leak detection equipment whenever possible.

NOTICE The condensate drain MUST be connected to an external drain line (provided by others) before unit start up. It is the responsibility of the installer to ensure that the equipment is draining correctly and that it meets all local codes.

Drain lines must be inspected regularly and maintenance must be performed to ensure that drain lines are clear and condensation runs freely through the drain system. The lines must be clear and free of obstructions and in good condition with no visible sign of damage or leaks.

3.8 Humidifier Piping

The optional humidifier on gPod systems is a steam generator type with disposable cylinder. The humidifier make-up 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 field provided shut-off valve should be installed outside the unit to allow disconnection of service. A field provided in-line water pressure regulator and strainer should be installed.

NOTICE Do not supply steam generating humidifier with demineralized, deionized, RO, or distilled water. Electrode steam humidifiers rely on dissolved salt and mineralized ions to pass current for steam production. Do not use hot make up water as a source. Supply water is recommended at 30 to 80 PSIG and 150-1200 Microsiemens (Hardness 0-12 GPG).

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.

3.9 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, Schrader fittings and compressor Rotolock type service valves. Check both field and factory connections.

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

When handling or recovering 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.

Pressurize system circuit to 150 PSIG (1034 kPa) by using dry nitrogen with a trace of refrigerant. Check the entire system for leaks with suitable leak finder (per local code) including but limited to all braze joints, caps, fittings and
flare nuts on both field and factory furnished components. After completion of leak testing, release test pressure and pull a vacuum on the system.

<table>
<thead>
<tr>
<th>NOTICE</th>
<th>Tightening of fittings and valves is the responsibility of the installing contractor.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOTICE</td>
<td>With any fluid connection there is risk of leakage. Water leakage could result in property damage to mission critical equipment. A water drain connection is required. Units with optional steam generator humidifiers will require an external potable water supply. Water leakage can result from improper installation and/or practices.</td>
</tr>
</tbody>
</table>

3.10 Evacuation

Moisture prevents the proper operation of both the compressor and the refrigeration system. Air and moisture reduce service life and increases condensation pressure, which causes abnormally high discharge temperatures that can degrade the lubricating properties of the oil. The risk of acid formation is also increased by air and moisture, and it this condition can also lead to copper plating. All these phenomena may cause both mechanical and electrical compressor failure. The typical method for avoiding such problems is to evacuate the system.

It is of the utmost importance that proper system evacuation and leak detection procedures be employed. Good evacuation processes include frequent vacuum pump oil changes and large diameter, short hose connections to both high and low sides of the system preferably using copper tubing or braided hose. All valves in the system, both liquid line solenoid valve and Rotolock type service valves (if the compressor is equipped with them), need to remain open during the vacuum process and the system must be purged of nitrogen. We recommend using a solenoid magnet tool to hold the liquid line solenoid valve open. A deep vacuum gauge capable of registering pressure in microns should be attached to the system for pressure readings. A shut-off valve between the gauge connection and vacuum pump should be provided to allow the system pressure to be checked after evacuation. Do not turn off vacuum pump when connected to an evacuated system before closing shut-off valve.

Triple evacuate the refrigerant lines, condenser coil and evaporator coil to 500 microns or lower (a micron gauge and 2-stage vacuum pump are required).

3.10.1 Evacuation Procedures

**Note:** Perform these procedures without contaminating the system with non-condensables

1. Evacuate system down to 4000 microns from both service valves. Then close the manifold gauges, shut off the vacuum pump and introduce dry nitrogen up to 5psi to the system without contaminating it. Then release the nitrogen and restart the vacuum pump.
2. Evacuate system down to 1500 microns from both service valves. Then close the manifold gauges, shut off the vacuum pump and introduce dry nitrogen up to 5psi to the system without contaminating it. Then release the nitrogen and restart the vacuum pump.
3. Evacuate system down to 500 microns or below from both service valves.
4. Turn off the vacuum pump and conduct a rise test waiting at least 30 minutes to make sure the micron gauge reading does not go back above 500 microns. If it does, restart the vacuum pump and evacuate until the system
reaches 500 microns. If the system still does not hold the pressure below 750 microns the system needs to be rechecked for leaks.

5. After the system has been satisfactorily evacuated, the unit can be pre-charged with refrigerant. Connect the pressure gauge manifold set to the high and low ports near the compressor, connect the charging line to the refrigerant tank and set it for liquid feed. Open the refrigerant tank valve and purge the line at the manifold, then open the high side valve on the manifold only and allow the refrigerant to flow until the system pressure equalizes. At this point the system will have 75 to 80% of the total refrigerant charge. Start the blower and then the compressor checking the operating pressure and temperatures.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING DO NOT APPLY POWER TO THE COMPRESSOR WHEN IN A VACUUM</td>
</tr>
</tbody>
</table>
4 Charging

As a minimum, the servicing technician should wear thermal protective gloves and face-shield/goggles when working with refrigerant.

**NOTICE** Application of excessive heat to any component will cause extreme pressure and may result in a rupture. Exposure of refrigerant to an open flame or a very hot surface will cause a chemical reaction that will form a highly poisonous and corrosive gas commonly referred to as PHOSGENE.

In its natural state, refrigerant is a colorless, odorless vapor. It is heavier than air and will disperse rapidly in a well-ventilated area. In an unventilated area, it presents a danger.

4.1 Air Cooled Systems

4.1.1 Packaged Air-Cooled Systems Ceiling Units (2.5 to 5 Ton)

Packaged air-cooled units come factory charged because all the refrigerant carrying components are self-contained with the evaporator and condenser sections.

**WARNING** Before starting a 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 the crankcase heater could result in compressor damage. If the system is charged from a vacuum, the preheating of the compressor is not necessary.

When starting-up the equipment, it is the responsibility of the field service technician to verify that the system is properly charged. A properly charged R-410A system operating at typical parameters will have the following pressures:

<table>
<thead>
<tr>
<th>Typical Operating Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head pressure</td>
</tr>
<tr>
<td>340 to 415 PSIG</td>
</tr>
<tr>
<td>Suction pressure</td>
</tr>
<tr>
<td>104 to 121 PSIG</td>
</tr>
<tr>
<td>Superheat (at the compressor suction line)</td>
</tr>
<tr>
<td>8°F to 15°F</td>
</tr>
<tr>
<td>Sub-Cooling</td>
</tr>
<tr>
<td>8°F to 10°F</td>
</tr>
</tbody>
</table>

An air-cooled package unit may require field charging if a compressor is changed if a leak develops or if non-condensable are in the system. Field charging should be done by referring to the unit electrical nameplate for the factory charge.

Although this value represents the original factory charge, it is still necessary to measure and note proper unit operation including superheat, sub-cooling, head and suction pressure. Some adjustment to charge may be required.
4.1.2 Split Air-Cooled Systems Charging (Units with Indoor Condenser or Outdoor Condenser)

After refrigerant piping installation, pressure test, and vacuum procedure is properly is complete, connect the refrigerant manifold gauge set and make sure the manifold gauge set is properly purged. Systems with R-410A require approximately 3 lbs. per nominal ton.

For example, a model GPAX-0334 is a nominal 3-ton unit. Charge with about 9 lbs. if R-410A. It is likely that more refrigerant will be required to complete the charging procedure for additional piping between the evaporator and the condenser. After hoses are properly purged, from a vacuum, slowly open the high side liquid line valve on the refrigerant manifold gauge to feed liquid refrigerant through the high side of the system until the pressures equalizes. At this point there will be about 70 to 80% of the total charge in the system. Use recovery machine to add refrigerant if necessary.

**WARNING** Before starting a 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 the crankcase heater could result in compressor damage. If the system is charged from a vacuum, the preheating of the compressor is not necessary.

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 more refrigerant will be required to complete the charging procedure. Finish charging by slowly opening the valve on the refrigerant manifold set to meter liquid refrigerant into the low side of the system.

Adjust the refrigerant charge until the sub-cooling is 8°F to 10°F and has sparse bubbles. The unit should be allowed to stabilize for several minutes before meaningful measurements can be taken.

A properly charged R410A system operating at typical parameters will have the following pressures:

<table>
<thead>
<tr>
<th>Typical Operating Parameters</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Head pressure</td>
<td>340 to 415 PSIG</td>
</tr>
<tr>
<td>Suction pressure</td>
<td>104 to 121 PSIG</td>
</tr>
<tr>
<td>Superheat (at the compressor suction line)</td>
<td>8°F to 15°F</td>
</tr>
<tr>
<td>Sub-Cooling</td>
<td>8°F to 10°F</td>
</tr>
</tbody>
</table>

**NOTICE** Charging to a full liquid line sight-glass should never be the sole means of determining the correct refrigerant charge. Finish charging by slowly opening the valve on the refrigerant manifold set to meter liquid refrigerant into the low side of the system. Other parameters such as superheat, suction pressure, head pressure, sub-cooling and ambient temperature are also important. A system charged to a clear sight-glass is often overcharged.

When charging is complete, add the correct amount of oil, if the line run exceeds more than 66 feet (20m). This procedure must be conducted with the system running at high load (compressor at full speed).
NOTICE ALWAYS use POE oil from new cans.

Oil addition is calculated based on refrigerant charge, shown in the table below:

<table>
<thead>
<tr>
<th>Total Refrigerant Charge (lbs.)</th>
<th>Fixed Speed Compressor</th>
<th>Total Refrigerant Charge (lbs.)</th>
<th>Fixed Speed Compressor</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>6</td>
<td>140</td>
<td>43</td>
</tr>
<tr>
<td>30</td>
<td>9</td>
<td>150</td>
<td>46</td>
</tr>
<tr>
<td>40</td>
<td>12</td>
<td>160</td>
<td>49</td>
</tr>
<tr>
<td>50</td>
<td>15</td>
<td>170</td>
<td>52</td>
</tr>
<tr>
<td>60</td>
<td>18</td>
<td>180</td>
<td>55</td>
</tr>
<tr>
<td>70</td>
<td>21</td>
<td>190</td>
<td>58</td>
</tr>
<tr>
<td>80</td>
<td>25</td>
<td>200</td>
<td>61</td>
</tr>
<tr>
<td>90</td>
<td>28</td>
<td>210</td>
<td>64</td>
</tr>
<tr>
<td>100</td>
<td>31</td>
<td>220</td>
<td>67</td>
</tr>
<tr>
<td>110</td>
<td>34</td>
<td>230</td>
<td>71</td>
</tr>
<tr>
<td>120</td>
<td>37</td>
<td>240</td>
<td>74</td>
</tr>
<tr>
<td>130</td>
<td>40</td>
<td>250</td>
<td>77</td>
</tr>
</tbody>
</table>

4.1.3 Flooded System Charging

Flooded type systems are supplied with 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 refrigerant in cold weather. In warm weather the extra refrigerant is stored in the receiver.

Flooded systems require more refrigerant than fan speed control systems. Connect the pressure gauge manifold set to the high and low ports near the compressor. Connect the charging line to the refrigerant tank and set for liquid feed. Open the refrigerant tank valve and purge the line. Open the high side valve on the manifold only and allow the refrigerant to flow until the system pressure equalizes. At this point the system will have 75 to 85% of the total refrigerant charge. Start the evaporator motor. Start the compressor and check the operating pressures and temperatures.

A quick and easy way to run the compressor is using the manual switch on the unit’s microprocessor. Switch the compressor manual switch to the ON position. All automatic control is disabled but safety switches will remain functional. Manual Control mode in dap4 or Mini-dap4 Menu I can be used to run fan and compressor as well.

For **units with blowers**, switch the blower manual switch to the “ON” position.

For **units with plug fans**, using the manual switch operation will not bring the fans to full speed. Enabling the BLOWER manual mode switch engages the system powering the high voltage to the plug fans but sets the control
signal to 0V. Enabling any other manual mode switch will likewise disable all control outputs from the dap4 panel resulting in full manual mode operation and setting the plug fans to 0V. To test the plug fan modules in manual mode, turn on blower and fan speed switch on manual over-ride modules. This will enable the fan control signal at approximately 90%. The fans will spin at near full speed.

**WARNING** Before starting a 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 the crankcase heater could result in compressor damage. If the system is charged from a vacuum, the preheating of the compressor is not necessary.

Start the evaporator fan and verify the fan rotation. From a vacuum, add liquid refrigerant to the high side of the system until the pressures equalize. Start the 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 pressure drop, low sub-cooling or low charge. It is likely more refrigerant will be required to complete the charging procedure.

If the receiver (head) pressure is below 322 PSIG with R-410A, block part of the condenser coil surface until the pressure rises to 322 PSIG R-410A or higher. If the receiver (head) pressure is below 322 PSIG with R-410A, block part of the condenser coil surface until the pressure rises to 322 PSIG for R-410A or higher. During extremely cold weather all the condenser fan must be de-energized to maintain head pressure.

Observe the sight-glass on the receiver. Add refrigerant through the suction line until the level of liquid in the receiver is approximately 1/3 from the bottom of the sight-glass (the leveling ball in the receiver will start to float). At this point the charging is correct. Observing the receiver sight-glass becomes difficult when they are remotely mounted near the condenser. The unit should be allowed to stabilize for several minutes before meaningful measurements can be taken.

After the system is stabilized, the superheat at the compressor suction line (reading from at least 6 inches from the compressor) should be 8°F to 15°F. Remove any blocks that may have been used on the condenser coil. If the ambient temperature while charging is below 70°F, some of the refrigerant will be backed up into the condenser coil causing the liquid level in the receiver to drop (this is normal).

**NOTICE** 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. A system charged to a clear sight glass is often overcharged.

For all gPods, both cooling mode and reheat mode need to be checked. Fully charge the gPod in cooling mode only. Once full charge is adequate in cooling mode, engage reheat mode with the controller reheat mode. The charge in reheat mode may need to be adjusted but always check cooling mode again to verify operating pressures are adequate.

**WARNING** R-410A Refrigerant is used in gPod systems. Death or serious injury may result if personnel fail to observe proper safety precautions. Great care must be exercised to prevent contact of liquid refrigerant or refrigerant gas.
discharged under pressure, with any part of the body. The extremely low temperature resulting from the rapid expansion of liquid refrigerant or pressurized gas can cause sudden and irreversible tissue damage.

The compressor POE oil for R-410A units is extremely susceptible to moisture absorption and could cause compressor failure. Do not leave system open to atmosphere any longer than necessary for installation.

---

NOTICE Do not apply power to the compressor when in a vacuum.

4.2 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, a technician who knowingly releases or vents refrigerant to the atmosphere is in violation of this regulation. Refrigerant purchasers must be certified technicians and have a valid EPA certification card.

Refrigeration systems contain fluids under pressure at dangerous temperatures and pressures. Proper safety procedures must be followed to provide a system that is acceptable. Refer to ASHRAE Standard 15, Safety Code for Mechanical Refrigeration and ASME Standard B31.5, Refrigeration for more detail regarding refrigerant handling.

Piping should be followed. Most building codes require adherence to these Standards. Technicians or installer should also be EPA or other government agency certified to handle refrigerants.

---

WARNING Pressure relief lines(s) with optional relief valves internal to the evaporator must be vented to the atmosphere per the latest edition of ASHRAE Standard 15 and/or any local building, fire or mechanical codes.
5  Electrical Connections

**WARNING** Risk of electric shock can cause injury or death. Disconnect local and remote electrical power before working within unit.

Customer must provide earth ground to unit, per NEC, CEC and local codes, as applicable. Before proceeding with installation, read all instructions, verify that all the parts are included and check the nameplate to be sure the voltage matches available utility power.

**WARNING** Arc flash and electric shock hazard. Risk of electrical shock could result in injury or death. Disconnect all remote electrical power supplies prior to working on or within the unit. Wear appropriate personal protective equipment per NFPA 70E before working within unit. Use voltmeter to make sure power is turned off before making any electrical connections. Failure to comply can cause injury or death.

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

**WARNING** Do not connect any additional loads to the system control transformers. Connecting additional loads to the factory supplied control transformer may result in overloading of the transformer.

**WARNING** Improper wire connections will result in the reverse rotation of the scroll compressor and will eventually result in damage to the compressor. To correct this problem, exchange any two of the incoming main power wires at the main power terminal block or optional disconnect switch.

**WARNING** Check the wiring connections in the electrical 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. Remove all packing and shipping materials from the unit before installation.

**WARNING** The Data Aire dap4 or Mini-dap4 controller does not isolate power from the unit, even in the Unit OFF mode. Some internal components require and receive power even during the Unit OFF mode of dap4 controller. The factory-supplied optional disconnect switch is located inside the unit electrical control panel. The line side of this switch contains live high voltage. The only way to ensure that there is NO voltage inside the unit is to disconnect all external line power to unit. Follow all local codes.
NOTICE All wiring must conform to local and national electrical code requirements. Use of copper conductors only. The Data Aire unit must be connected and serviced by a licensed and qualified electrician.

NOTICE Refer to equipment nameplate regarding wire size and circuit protection requirements. Refer to electrical schematic when making connections.

NOTICE Seal openings around piping and electrical connection to prevent air leakage. Failure to do so could reduce the unit’s cooling performance.

5.1 General Electrical Field Wiring Guidelines

1. Do not run low voltage or control wires in same conduit, raceway, or chase as high voltage wiring.
2. Upon arrival of the unit inspect all wiring and electrical components for damage, either visible or concealed before installation.
3. Use correctly sized copper wire only and verify that all electrical connections are tight before turning power “ON”.
4. Check all electrical connections periodically and tighten as necessary.
5. All field supplied cable shall have the following specifications (Control wires only):
   a. Conductors—AWG stranded copper
   b. Twisted pair (minimum eight twists per foot)
   c. Braided shield or foil shield
   d. UL approved temperature rated to 105°C
   e. UL approved voltage rated to 600V
   f. UV-resistant, oil resistant and moisture-resistant if not provided in conduit.
6. Plenum rated (As required by national or local codes.)
   All field supplied wires shall have the following guidelines:
   a. Conductors - stranded copper and sized per circuit ampacity under NEC
   b. UL approved temperature rated to 105°C
   c. UL approved voltage rated to 600V
   d. UV-resistant, oil resistant and moisture-resistant if not provided in conduit.
7. Wire current capacity must be sized in accordance with NEC, national or local codes.

5.2 Electrical Service

Check to be sure the electrical service provided from the facility electrical power source 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 as well. Indoor split units typically have a single power source but can also be provided with separate sources. Field provided interconnecting control wires are also required. See Auxiliary Control Wiring section.
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.

5.3 Nameplate Ratings

The unit nameplate is located inside the cabinet on the outside of the electrical control panel door. The nameplate includes Minimum Circuit Ampacity (MCA) also known as wire sizing amps which indicates the minimum required wire gauge. The Maximum Overcurrent Protection (MOP) device amps indicate the maximum circuit breaker or fuse size required to protect the system. Other protection devices must be verified by the installing contactor to be compliant with the product UL listing.

The facility main distribution panel which provides electrical service to the Data Aire equipment must be provided with a manual fused disconnect switch or circuit breaker per local and national electrical codes.

| NOTICE | Do not mount a field supplied manual fused disconnect switch or circuit breaker to the surface of the equipment. |

5.4 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 panel. See example of an electrical ground lug below.

*Figure 9 - Typical Grounding Lug*

5.5 Voltage Tolerance

The supply voltage to the unit must be within tolerance:

<table>
<thead>
<tr>
<th>Nominal Voltage (VAC)</th>
<th>Utilization Voltage (VAC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>208</td>
<td>191 to 218</td>
</tr>
<tr>
<td>230</td>
<td>211 to 241</td>
</tr>
<tr>
<td>277</td>
<td>254 to 291</td>
</tr>
<tr>
<td>460</td>
<td>422 to 483</td>
</tr>
<tr>
<td>575</td>
<td>527 to 604</td>
</tr>
</tbody>
</table>

Utilization Voltage is the voltage at the equipment load or available voltage at the terminals of the equipment.

Phase to phase imbalance must not exceed 3%.
The local utility company should be contacted for correction if improper line voltage exists. Deviation from ratings can cause premature failures and possibly void unit warranty. For three-phase units, only three power wires and a proper earth ground are required. A neutral is not required at the unit input connections.

5.6 Standard Electrical Connections
The electrical line power interface connection point may be a standard power distribution block or an optional disconnect switch.

If equipped with an optional dual power source (i.e., primary and secondary high voltage and/or primary and secondary low voltage) the entrances are all located on the electrical control panel. All electrical components, including contactors, relays and control transformers are pre-wired and contained in a unit-mounted electrical control panel. The control circuit voltage is 24 VAC.

5.7 Controllers

5.7.1 Floor Mounted Units

Floor mounted units are equipped with a microprocessor based dap4 controller and includes a dap4touch graphic display for easy operation and setting adjustments. Equipment supplied before June 2019 have a backlit liquid crystal display (LCD) with six keys (buttons). The dap4 controller includes the unit control and displays operating functional information and service diagnostics. The controller allows recall and display of the high and low temperature, high and low humidity, current percent of capacity and average percent of capacity for chilled water valve, compressor, reheat, humidification, dehumidification, component runtimes for fan motor(s), reheat, humidification, and dehumidification (if applicable).

See the separate dap4 User Manual for detailed programming and operating instructions.

5.7.2 Ceiling Mounted Units

Ceiling units are equipped with a microprocessor based Mini-dap4 controller. The Mini-dap4 controller system is comprised of two (2) major components: a wall mount display and a unit mounted controller. A combination temperature and humidity sensor is included with each system and is unit mounted but this combination sensor can also be remote mounted as an option. The wall mount display includes a remote dap4touch display. Equipment supplied before June 2019 has a backlit liquid crystal display (LCD) with six keys (buttons). The controller is mounted on the ceiling mounted evaporator section and connected to the remote display via a special “telephone like” cable which is included with the system. If touch display is used, a different type of display cable is provided. An optional remote mounted temperature and humidity sensor is a separate wall mounted device which is to be mounted at
the client’s selected location in the controlled space. The combination remote temperature and humidity sensor is connected to the control module via separate wiring which is also included with the system.

The dap4 and Mini-dap4 controllers allows recall and display of the high and low temperature, high and low humidity, current percent of capacity and average percent of capacity for chilled water valve, compressor, reheat, humidification, dehumidification, component runtimes for fan motor(s), reheat, humidification, and dehumidification (if applicable).

See the separate dap4 or Mini-dap4 User Manual for detailed setup and operating instructions.

5.8 Auxiliary Control Wiring

The interconnection of auxiliary control wiring for remote heat exchangers (condensers and fluid coolers) requires the connection of two (2) 18-gauge wires for installations up to 150 feet (45 m) or 16-gauge wires for installations from 151 feet (46 m) up to 200 feet (61 m) from the electrical control panel of the indoor evaporator to the electrical control panel of the remote heat exchanger.

Because of the wide variety of indoor evaporators and remote heat exchangers offered by Data Aire, the installing contractor must refer to the electrical diagrams which are provided inside the electrical control panel of each unit for the required auxiliary control wiring interconnection terminal points. Figure 10 - Typical Remote Heat Exchanger Interconnection Points and Figure 11 - Typical Indoor Evaporator Interconnection Points show typical interconnection points.

**NOTICE** Check the wiring connections in the electrical 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.

*Figure 10 - Typical Remote Heat Exchanger Interconnection Points*
The wiring connection for heat exchanger for units with Mini-dap4 controller may be different. Again, refer to unit electrical diagram for details.

5.9 Remote Shutdown

Every Data Aire evaporator has a remote shutdown contact point available inside the electrical enclosure as part of the control wiring. These are intended for a remote field supplied dry contact or switch to be wired across two terminals. When the remote contact or switch opens, the control circuit power is interrupted, and the unit shuts down, including the controller. The control circuit is 24 VAC and the field provided contact or switch and wiring should have a minimum rating of 10 amps. A minimum of 18-gauge wire is recommended or use field-supplied Class 1 wiring.

The remote shutdown points are terminals TB1-1 and TB1-2 (to verify these points, see electrical diagrams supplied with each unit to verify the exact TB designation). The unit is shipped with a factory installed jumper bar that connects TB1-1 and TB1-2. Remove this jumper prior to installing the field wires when utilizing the remote shutdown feature.

5.10 Remote Alarm Contacts

5.10.1 Mini-dap4 Controller

Units with a Mini-dap4 controller include one (1) combination Normally Open (Close on Alarm) and Normally Closed (Opens on Alarm) dry contact remote alarm contact. See Figure 12 for the typical terminal connection points.

The remote alarm contacts are field accessed and are intended to be used for a remote-control circuit. This remote output contact is limited to 2 amps at 250 VAC. This alarm contact activates on a failure and remain energized until the alarm is no longer present.

5.10.2 dap4 Controller

Units with a dap4 controller include four (4) combination Normally Open (Close on Alarm) and Normally Closed (Opens on Alarm) dry contact remote alarm contacts. See Figure 13 for the typical terminal connection points.
The four (4) remote alarm contacts are field accessed and are intended to be used for a remote-control circuit. These remote alarm contacts are limited to 2amps at 250 VAC. Each alarm contact activates on a failure and remain energized until the alarm is no longer present.

5.11 Remote Temperature and Humidity Sensor

A combination remote temperature and humidity sensor is an option. The remote sensor option provides a convenient means of field installation because the sensor is already connected to a predetermined length of multi-conductor cable and a remote wall mounted enclosure.

When ordered, the remote temperature and humidity sensor is shipped with a 35-foot (11 m) cable as the standard length with 50 feet (15 m), 75 feet (23 m) or 150 feet (46m) optional length cables.

5.12 Condensate Pump (Optional)

If a gravity drain is not available, an optional condensate pump is available. A condensate pump may be unit mounted or shipped loose for field assembly and wiring. If the condensate pump is unit mounted and powered, no outside power source is required. If the condensate pump is shipped loose, a separate source of power is normally required. The condensate pump is available in various voltages so always check the condensate pump power requirements before connecting power.
**WARNING** The condensate drain MUST be connected to an external facility drain line (provided by others) before unit start up. Without field piping condensate water will damage internal components.

A factory installed condensate pump come pre-wired and setup to display a “HIGH CONDENSATE WATER LEVEL” alarm. The wiring for the alarm must be done in the field on a pump that ships loose.

5.13 Condensate Probe (Standard on Floor Units and Optional on Ceiling Units)

A condensate probe for sensing under floor water is included with all floor units. Additional condensate probes may be added. The probe comes pre-wired and located in a plastic bag with approximately 8 feet (2.4 m) of coiled-up wire inside the electrical control panel. The probe has a flat plate on the bottom that is typically placed below the unit in a location where the water is likely to accumulate.

Place the probe flat on the floor using a thin layer of nonconductive silicone or calking. Secure the attached wires to prevent accidental snagging where necessary. If a longer length of wire is needed, standard hook-up wire may be used if required.

**NOTICE** Failure to remove the probe from the plastic bag, uncoil the length of wire attached to the condensate probe and locate the probe under the unit, can result in a nuisance water detected alarm.

5.14 Float Switch (Ceiling Units)

Ceiling units come standard with a factory pre-mounted and wired condensate pan overflow detection float switch located in the condensate drain pan. If needed, an optional flow switch can be ordered to be used as a secondary condensate drain pan alarm. Consult factory for details.

5.15 Under-Floor Water Detection Cable (Optional)

Another option for water sensing is the Under-Floor Water Detection Cable. This is a special long cable that can sense moisture anywhere along its length. It is typically placed below the unit in the secondary containment pan a rectangular pattern that matches or slightly larger than the perimeter of the unit. The cable is pre-wired to the appropriate terminal connection inside the electrical control panel and ready for field installation. Cable lengths vary depending on the length ordered. Typically, the cable is installed around the unit perimeter. Care should be taken when installing the cable. The two water sensing wires are covered by a nonconductive polymer weave. This weave isolates the cable from metal surfaces. However, as with all electrical wires and cable, avoid sharp objects that can slice or pierce through the insulation and nonconductive polymer weave.

5.16 Disconnect Switch (Optional)

A thru-door locking disconnect switch is an optional feature which includes a non-automatic trip disconnect switch with handle mounted in the high voltage section of the electrical control panel. The handle prevents access to the high voltage electrical components until the disconnect switch is turned to the OFF position. The handle protrudes through the exterior door and can be locked with a field supplied padlock in the OFF position for safety during servicing the unit.
NOTE: Units are shipped with the disconnect switch handle removed and located in a plastic bag inside the electrical control panel. This is done to prevent damage to the handle and operating mechanism during transit and when moving the unit to the final installation location.

**NOTICE** Consult local and state electrical and safety codes for external line power disconnect switch requirements.

5.17 Manual Override Switch Board (dap4 Only)

For testing and during start-up each floor mounted gPod unit is equipped with manual override slide switches. There are seven (7) slide switches. One for each of the following functions:

- Water valve
- Fan Speed
- Humidifier
- Heat 1
- Cool 1
- Cool 2
- Blower

All automatic control is disabled but the safety switches remain functional. Simply slide the manual switches to energize the fan, compressor, humidification, reheat and other functions (as applicable).

**WARNING** Do not leave the unit in manual override. Slide the switches to the OFF position when completing testing and/or start-up. An alarm will be activated if units are left in the ON position.

5.18 Wiring Diagrams

Every Data Aire evaporator, condenser, or fluid cooler comes with a ladder type schematic and a point-to-point wiring diagram intended for service personnel. These diagrams allow the technician to understand the wiring details associated with the electrical components and how they interface with the controls as well as peripheral equipment (including remote heat exchangers).

The wiring diagrams in the evaporator and heat exchanger sections will indicate field interface terminals to be used to interconnect these sections. The wiring schematics and point-to-point diagrams are found on the inside cover of the electrical control panel door for each part of the equipment. Paper copies of both diagram types are also placed inside the shipping/warranty packet secured inside the electrical control panel of each part of equipment.
Evaporator wiring diagrams normally will have a drawing number that starts with a three-letter designation, “GPX” or “GPU”. An example of a typical diagram is GPX-S-908.

5.19 Plug Fan “No Airflow Alarm” Current Sensing Switch (Plug Fan Unit Only)

The current sensing switch is pre-wired and set at the factory and does not normally require adjustment in the field. But if the plug fans speed operating mode is changed in the field, the current sensing switch may require adjustment of the no airflow alarm.

Unit with backward curve plenum fans with electronically commutated (EC) motor (i.e., plug fan) use a current sensing switch (CT) as a safety to alarm when the airflow is unusually low or no airflow. Figure 14 - Current Sensing Switch shows the CT used to detect a “No Airflow Alarm”. Before starting the adjustment, make sure you have a small flat blade screwdriver that can fit in the potentiometer slot of the relay.

5.19.1 “No Airflow” Switch Adjustment

The following steps show how to use the controller to adjust the plug fan speed to run at a desired low current draw setpoint.

1. With the unit running, enter the Factory Level password. To gain access to the menus, press the Menu button then use the UP or Down keys and the Enter key to enter the Factory Password 0002. Next, proceed to Menu I: Manual Control and press Enter.
2. Adjust the “Return to Auto” to 300 seconds. This will allow time to operate the plug fan(s) at a lower speed to make the current sensing switch adjustment before returning the unit back to normal operation.

3. Move to Menu Analog Output 3 and adjust the fan speed to the desired low limit operating point. In this example, the low limit is 30%. Change the “Mode” to “Manual” and “Manual Value” to 3.00VDC.

4. At this point, the fan will be running at 30% of the fan’s base speed and you might see the display shows “No Airflow Alarm” because the fan(s) are running at a slower speed than normal operation.

Figure 15 - CT Trip Adjustment and LEDs
<table>
<thead>
<tr>
<th>P/N</th>
<th>LED Color</th>
<th>Operation Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/ACSX2 or A/ACSX</td>
<td>Red</td>
<td>The Red “TRIP ON” LED indicates the current is below the adjustable trip point. When the Red “TRIP ON” LED is lite, the fan(s) are operating at a slower speed (i.e., drawing less current) than normal operation and the “No Airflow Alarm” message will appear on the controller alarm display. NOTE: At very low monitored input currents the LEDs may not light.</td>
</tr>
<tr>
<td>A/ACSX2</td>
<td>Blue</td>
<td>The Blue LED indicates the current is above the adjustable trip point. When the Blue “TRIP OFF” LED is lite, the fans are operating in a normal current range and the “No Airflow Alarm” message will disappear from the controller alarm display.</td>
</tr>
<tr>
<td>A/ACSX</td>
<td>Green</td>
<td>The Green “TRIP OFF” LED indicates the current is above the adjustable trip point. When the Green “TRIP OFF” LED is lite, the fan(s) are operating in a normal current range and the “No Airflow Alarm” message will disappear from the controller alarm display.</td>
</tr>
</tbody>
</table>

5. Use the small flat blade screwdriver to adjust the “TRIP ADJ” potentiometer clockwise until the Red “TRIP ON” LED lights. Continue to turn the potentiometer another half turn to make sure that the setpoint is slightly lower than the required setpoint. In this example, 3.00VDC.

6. After the above adjustment and the Return to Auto times out (after 300 seconds), the fan speed will return to the original factory preset speed, the Green “TRIP OFF” LED will be lite and the “No Airflow Alarm” message will disappear from the controller alarm display.

7. The current sensing switch is now set and will trigger a “No Airflow Alarm” if for some abnormal reason, the fan current drops to an unusually low point.
6 Important Components

6.1 Remote Heat Exchanger
Air cooled outdoor condensers and fluid coolers have individual Installation, Operation and Maintenance manuals which should be referred for more complete details. Most of the controls on remote condensers and fluid coolers consist of basic electromechanical type components.

6.2 Refrigeration Components

6.2.1 Expansion Valve
Each refrigerant circuit has an adjustable thermal expansion valve (TXV). These are factory adjusted to their nominal range and normally do not need re-adjustment. 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.

6.2.2 High Pressure Cutout Switch
Each refrigeration circuit is protected by a high-pressure cutout switch with a manual reset button. The switch is located near the compressor. The fixed pressure setting for R-410A systems is 575 PSIG (3965 kPa).

6.2.3 Low Pressure Cutout Switch
Each refrigeration circuit includes a low-pressure cutout switch with automatic reset. The switch is located near the compressor. The fixed pressure setting for R-410A systems is 20 PSIG (138 kPa).

6.3 Controls

6.3.1 Mini-dap4 Controller (Ceiling Units)
The Mini-dap4 controller is the standard controller on ceiling mounted gPod units.

| NOTICE | The Mini-dap4 controller has an entire manual dedicated to extensive detail regarding functions, features, programming and troubleshooting. This manual must be referenced to complete a thorough unit installation and start-up and is not complete until the Mini-dap4 controller settings are established. |

6.3.2 dap4 Controller (Floor Units)
The standard controller on all floor mounted gPod equipment is the dap4 controller. The Expanded dap4 controller is also available as an upgrade from the Mini-dap4 and offers additional features and additional analog inputs/outputs compared to the Mini-dap4. This state-of-the-art controller has a separate manual that goes into extensive detail regarding functions, features, programming and troubleshooting.

| NOTICE | The dap4 or Mini-dap4 controller has an entire manual dedicated to extensive detail regarding functions, features, programming and troubleshooting. This manual must be referenced to complete a thorough unit installation and start-up and is not complete until the dap4 controller settings are established. |
7 General Maintenance Requirements

Data Aire units have been designed to operate continuously, provided they are regularly maintained and operated within the limitations given in this manual. Each unit should be included in a routine schedule of daily maintenance checks by the operator/customer, backed up by regular service inspection and maintenance visits by a suitably qualified Service Engineer. Good maintenance practices are essential to minimizing operation costs and maximizing product life.

It is entirely the responsibility of the owner or personnel to provide for these regular maintenance requirements and/or enter into a maintenance agreement with a Data Aire Authorized Service Company to protect the operation of the unit.

Data Aire recommends the use of trained and authorized service personnel, extended service contracts and factory-specified replacement parts. Contact Data Aire Service Department for additional information.

If damage or a system failure occurs due to improper maintenance during the warranty period, Data Aire shall not be liable for costs incurred to return the unit to satisfactory condition. See Data Aire warranty for additional details.

7.1 Daily Maintenance

The following maintenance checks should be carried out daily by the operator/customer. Please note that the units are not generally user serviceable and no attempt should be made to rectify faults or problems found during daily checks unless competent and equipped to do so. If in any doubt, contact Data Aire Service Department.

- Press the ‘Alarm’ key on the display module to ensure no fault messages are displayed.
- Read the operating conditions and temperatures at the display module using the display keys and check that these are within the operating limitations for your installation site.

7.2 Scheduled Maintenance

The maintenance operations detailed in the Maintenance Inspection Checklist at the end of this section should be carried out on a regular basis by a suitably qualified Service Technician. It should be noted that the interval necessary between each ‘minor’ and ‘major’ service can vary depending on, for instance, application, site conditions and expected operating schedule. Normally a ‘Minor’ service should be carried out every month and a ‘Major’ service quarterly.

---

**NOTICE**

Personal protective equipment is to be used for maintaining and servicing equipment. Some operations when servicing or maintaining the unit may require additional assistance regarding manual handling. This requirement is down to the discretion of the engineer. Remember do not perform a lift that exceeds your ability. All maintenance and servicing must follow environmental and safety regulatory requirements.

**WARNING**

Turn OFF all electric input power to the unit before servicing or maintenance.
7.3 Removing Doors and Panels for Maintenance (Floor Units)

1. The door hinge is spring loaded and slides down using the latch, for easy removal of the doors. Door hinges allow the door to be lifted off.

[**NOTICE** Risk of handling doors can cause personal injury and equipment damage. Follow relevant OSHA lifting recommendations and consider using a two-person lift for safe and comfortable removal and installation of doors. Only properly trained and qualified personnel wearing appropriate safety headgear, gloves and shoes should attempt to remove or install doors.]

2. Turn OFF the optional disconnect switch and/or disconnect all power sources to the units before opening any door or panel.
3. Unlock and open the door by using a flat blade screwdriver or other tool to turn the door latch 90° to unlock the door. Most doors on larger floor mounted units will have a door latch at the top and bottom of each door. Unplug the dap4 display connection cables, if needed.
4. Pull down on the spring-loaded catch to disengage the top of the door then lift the door up and off the hinges. When re-installing doors, remember to reconnect the dap4 display interface connection cable, if needed.

*Figure 16 - Door Top Section with Spring Hinge*

5. Remove screws from rear panel to remove rear panel.
6. If needed, open the front electrical control panel by pushing down on both spring latches on electrical control panel.
7.4 Electronically Commutated (EC) Motors (EC Motors)

Units with Electronically Commutated (EC) motors “plug fans” are standard on all floor mount gPod units.

**NOTICE** The plug fan modules are powered by high voltage input line power (i.e. 208-230-460V/3PH/60HZ) and speed is set from 0-10V DC control signal from the unit’s dap4 or Mini-dap4.

Fan speed is factory set based on airflow and static requirements when an order is placed.

Fan speed can be changed in 1% increments via the Mini-dap4 or dap4 controller. See the Mini-dap4 or dap4 User Manual (Menu J Factory Settings) for details and recommended settings.

7.4.1 EC Plug Fan Manual Test (Units with a dap4 Controller Only)

To manually test the EC plug fans, turn ON the Blower slide switch and the Fan Speed slide switch on the Manual Override Switch Board. This will enable a temporary analog fan control signal to the maximum value which is preset at the factory. The plug fan(s) will rotate near full speed. After the test is complete, turn OFF the Fan Speed and Blower slide switches.

7.4.2 Protective Features

EC motors have built-in protective features that include:

- Over-temperature protection of the (motor) electronics
- Over-temperature protection of the motor
- Locked rotor protection
- Phase failure detection
- Under-voltage detection
- Short-circuit protection

If any of the conditions exist, the EC motor stops automatically, and a NO AIRFLOW alarm will be energized and displayed on the unit display. To reset, the power source must be switched OFF for a minimum of 3 minutes. The motor will start automatically when the power is restored. If these alarms continue, there is probably an internal...
fan motor failure and the fan may need to be replaced. Consult Data Aire Service department for trouble-shooting assistance.

**NOTICE** If for any reason the rotor is blocked, the motor will electronically switch off. Before looking for any blockage make certain to disconnect the electrical power source to the unit. Once the blockage is cleared the motor will automatically restart when the electrical power is turned back on.

EC motors have under voltage protection. If the power source voltage falls below approximately 150VAC/3Ph (for 230-volt motors) or approximately 290VAC/3Ph (for 460-volt motors) for a minimum of five (5) seconds, the motor will automatically switch off and a NO AIRFLOW alarm will be energized and display on the controller. If the power source returns to the allowable voltage, the motor will automatically restart.

**NOTICE** The Mini-dap4 or dap4 controller has a time delay before the NO AIRFLOW alarm is energized. The alarm is adjustable from 5 to 180 seconds, in 5 second increments. On sites where a voltage problem is known to exist; the delay can be adjusted to eliminate “nuisance” alarms until the problem is corrected. See Menu K- ALARMS and LIMITS, NO AIR FLOW ALARM TIME DELAY in the Mini-dap4 or dap4 User Manual.

7.4.3 EC Plug Fan Maintenance
Maintenance is not required on EC motor/plug fan modules. The motors are sealed, have maintenance free ball bearings and permanent lubrication. The only acceptable service is replacement.

7.5 Units with Belt Driven Blowers
Belt driven blowers are standard on all gPod ceiling units. These blowers have belts and some bearings that must be regularly maintained.

7.5.1 Belts
Belt tension should be checked on a regular basis (monthly) to ensure proper tension. If tightening is required, loosen the four (4) mounting bolts. Turn the adjustment screw on the end of the motor mounting channel until the proper belt tension is attained. Retighten the four (4) mounting bolts. Damage can occur from belts that over tightened. The amount of play in a typical drive set should be 1/2 inch. When tightening the belts make sure the pulley alignment is true. If the belts are over tightened or if the pulleys are misaligned, the bearing life and belt life are shortened considerably.

7.5.2 Bearings
Ceiling mounted gPod units with 2 HP or smaller motors have permanently lubricated bearings and do not require maintenance. Motors of 3 HP and above have a pillow block bearing that must be greased quarterly, as needed. Some motors have Zirk type grease fittings on the bearings. If so, the motor should be greased at least annually. Use NLG1 grade 2 lithium or lithium complex grease. Care should be taken to avoid over-greasing the bearings. Only one or two pumps from a manual gun are required.
7.6 Air Filters

The air filter section is an integral part of the environmental control system, designed within the unit for easy front and/or side accessibility. An initial set of filters are factory installed in the unit. The filters are 2-inch deep for ceiling units or 4-inch deep for floor units unless otherwise specified, disposable, pleated design, extended-surface, nonwoven, reinforced cotton fabric; enclosed in cardboard frame design rated not less than MERV 8 per ASHRAE Std. 52.2. A filter differential switch for alarm activation is included on some units and optional on other units. Air filters should be checked on a regular basis and changed when they become dirty. This will ensure efficient operation of the unit. Air filters that are not maintained and require changing can restrict airflow and create problems such as coil icing or poor air distribution. Spare air filters should be kept in stock as these tend to be a frequently replaced maintenance item. Air filters may require changing as often as monthly dependent on room or space conditions.

On some units, the dap4 controller monitors the air filters status and a dirty filter alarm will be enunciated on the display and available as a Building Management System (BMS) data port. Although the unit may display a dirty filter alarm, this should not be relied on as the only determinant for replacing air filters. A misadjusted air filter differential pressure switch may not give a proper indication of a clogged filter.

To check the air filter pressure differential pressure switch for proper adjustment, temporarily cover approximately 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. All side panels must remain closed when determining if an adjustment is necessary.

In general, the filters are removable from the front of the unit on Data Aire gPod floor units, unless otherwise specified. gPod ceiling mounted unit filters are removable from the side, unless otherwise specified.

**NOTICE** Replace filter elements with same type and MERV rating. Replacement filters must be U.L. and CSA approved.

**WARNING** Air filters that are dirty and require changing can restrict airflow and create problems such as coil icing or poor air distribution.

### 7.6.1 Upflow Unit Air Filter Replacement Procedure

1. Turn OFF all electrical input power to the floor unit with the external disconnect.
2. Open the front access door(s) and remove the filters by lifting them up and maneuvering the filter downward and out of the unit.
3. Replace with new filters of equal size and type. Install the filters in the proper direction of the airflow. New filters must be U.L. and CSA approved.
4. Test the operation of the filter differential pressure switch. The unit door(s) must be in place and closed to determine the proper differential pressure setpoint.
5. Turn ON the electrical input power to the unit which will start the blower(s) and temporarily cover approximately 75% of the return air opening using heavy cardboard or similar material to cause the filter differential switch to alarm. Adjust the switch setpoint, if necessary.
7.6.2 Ceiling Unit Air Filter Replacement Procedure

1. Turn OFF all electrical input power to the ceiling unit with the external disconnect.
2. Using an OSHA approved ladder, remove filter cover from the side of the unit to access the filter.
3. Remove the old filter(s) from unit. Use care to prevent any damaged to the existing sensors and/or other components that may be mounted near the filter(s).
4. Replace with new filters of equal size and type. Install the filters in the proper direction of the airflow. New filters must be U.L. approved.
5. If equipped, test the operation of the filter differential pressure switch. The unit panels must be in place and closed to determine the proper differential pressure setpoint.
6. Turn ON the electrical input power to the unit which will start the blower(s) and if possible, temporarily cover approximately 75% of the return air opening using heavy cardboard or similar material to cause the filter differential switch to alarm. Adjust the switch setpoint, if necessary.

7.7 Humidifier

Some units are provided with a self-contained, microprocessor-controlled steam generator type humidifier as standard equipment and others as an option. The steam generating humidifier uses a disposable cylinder with electronic controls. The humidifier discharges pure steam with no material dust carry-over and has a self-regulating automatic flush cycle. Cylinders are disposable and do not requiring cleaning or maintenance. The humidifier fill level, water conductivity and flush rate automatically adapt, both in frequency and duration, to variations in the incoming water. The humidifier assembly is capacity field-adjustable and includes a high-water probe. Drain duration and drain interval are also field-adjustable. See the humidifier manufacturer’s literature for more detailed information on field adjustments.

7.7.1 Humidifier Cannisters

The humidifier has been designed to require very little maintenance. Regular maintenance consists of checking the humidifier to insure it is in good condition, replacing the cylinder when the software advises that the cylinder is spent and cleaning out the drain valve whenever the cylinder is replaced. The frequency of change will depend on usage and water type. A set of the humidifier manufacturer’s instructions is included with the paperwork placed inside the unit when it ships.

7.7.2 Cylinder Spent Fault

After an extended period of operation, the cylinder is completely spent the humidifier will stop operating and the yellow LED will flash in a repeating pattern of 4 flashes. At this time the cylinder must be replaced. The steam cylinder is disposable and must be replaced at end of cylinder life. Cylinder life is dependent on water supply conditions and humidifier usage. Failure to replace the cylinder at the end of cylinder life will result in improper operation and may result in damage to the humidifier. Data Aire is not responsible for any damages resulting from, or attributed to, the failure to replace a spent cylinder. Data Aire recommends keeping a replacement cylinder in stock throughout the humidification season. This will prevent possible downtime when the humidifier reports cylinder end of life.

7.7.3 Replacement Cylinder

The label on the existing cylinder identifies the cylinder type in its top left corner. When ordering a cylinder always quote the three or five-digit model number on the label, the humidifier’s serial number, and the humidifiers voltage.
Serial number and voltage are located on the specification label on the left side of the humidifier. Contact Data Aire Parts Department for replacement humidifier cylinder.

7.7.3.1 Removing the Cylinder

1. Check to see if yellow service light is flashing meaning cylinder replacement is necessary.
2. Turn OFF the water supply to humidifier.
3. The old cylinder must be drained completely before removing. This is done by pushing the ON/OFF/Drain switch to the “Drain” position.
4. Let the humidifier drain until no more water is flowing out to drain (usually not more than 10 minutes).
5. When completely drained, push the ON/OFF/Drain switch to the “OFF” position.
6. Turn OFF all electrical input power to the unit with the external disconnect. The inside of the humidifier’s cabinet contains high voltage components and wiring. Access should be limited to authorized personnel.
7. The power wires to the cylinder are attached by cylinder plugs to the electrode pins on top of the cylinder. Pull these plugs vertically off the pins.
8. Using slot screwdriver, loosen the steam hose clamp(s) and pull steam hose off vertically.
9. Using a small flat screwdriver press the tab on the cable tie holding the cylinder in place and pull the cable tie open.
10. Tip the top of the cylinder forward to pivot it and lift the cylinder out.
11. Always clean the drain valve before installing a new cylinder. Scale from the spent cylinder may have fallen into the drain valve and could prevent its proper operation.

Figure 18 - Typical Top of Humidifier Cylinder View
7.7.3.2 Humidifier Drain Valve Cleaning

**NOTICE** Cleaning the humidifier drain valve procedure must follow the cylinder removal procedure.

1. To properly clean the drain valve, it must be removed and disassembled.
2. Disconnect spade terminals from the drain valve.
3. Remove the screw holding the green ground wire and the two screws holding the valve to the drain pan.
4. Squeeze the tabs of the spring clamp holding the hose to the drain valve and slide it up the hose. Pull hose from drain valve. Lift the drain valve from the drain pan.
5. Unsnap red coil cap on solenoid and remove the solenoid from the valve.
6. Loosen brass nut holding actuator to plastic housing with a wrench and disassemble actuator.
7. Clean actuator components and valve housing (inlet port, outlet port, and cylinder port). Use the new O-ring that was supplied with new cylinder into valve.
8. Reassemble actuator making sure tapered end of spring is oriented as shown Figure 21 - Typical Drain Valve Assembly. Tighten brass nut 1/4 turn past hand tight.
9. Clean out end of hose and reattach to valve. Slide hose clamp back in place and place valve into drain pan.
10. Secure the valve with two (2) screws and attach the green ground wire to the solenoid.
CAUTION Be sure to reattach the green ground wire to reduce the risk of electrical shock.

Figure 20 - Typical Humidifier Drain Valve

Figure 21 - Typical Drain Valve Assembly
7.7.3.3 Replacing the Humidifier Cylinder

**NOTICE** Make sure the new cylinder is the same model as the one that was removed. The cylinder model number is on top left corner of cylinder label.

1. Insert the cylinder into drain valve. Tilt cylinder forward and fit end of steam hose to steam outlet. Tip cylinder back into place.
2. Secure cylinder with the reusable cable tie. Tighten hose clamp being careful not to over tighten and crush the plastic cylinder steam outlet.
3. Attach color-coded cylinder plugs to the corresponding color-coded cylinder pin. Push down completely. Connect high water sensor plug. Spring-loaded plugs should fit snuggly onto the cylinder pin. Replace if they are loose or damaged.
4. Turn on the power to humidifier with the external disconnect.
5. Open supply water shut off valve.
6. Turn the humidifier ON/OFF/Drain switch to ON position.
7. Check the humidifier distributor hose and distributor for leaks, wear or damage. Repair as needed.
8. Check humidifier wires for wear or damage. Repair as needed.

**NOTICE.** Failure to replace the cylinder at the end of cylinder life will result in improper operation and may result in damage to the humidifier.

It is recommended to keep a replacement cylinder in stock throughout the humidification season. This will prevent possible downtime when the humidifier reports cylinder end of life. Contact the Data Aire Parts Department for details.

7.7.4 Preparing Humidifier for Extended Shutdown Duration

If the humidifier needs to be taken out of service for an extended duration, use the following instruction to prepare the humidifier for extended storage.

1. Close the supply water shut-off valve.
2. Drain the cylinder, otherwise the electrodes are subject to harmful corrosion which drastically shortens the cylinder life.
3. Switch the ON/OFF/Drain switch to the “Drain” position.
4. Wait until the humidifier is completely drained (usually takes less than 10 minutes).
5. Turn the ON/OFF/Drain switch to the “OFF” position. Do not leave the switch in the Drain position.
6. Turn OFF all electrical input power to the unit with the external disconnect. Remove all humidifier fuses to isolate the humidifier from operating. Remember to replace the fuses when the humidifier is placed back in service.
7. Turn ON the electrical input power to the unit so the unit can cool the space while the humidifier is out of service.

7.7.5 Starting Humidifier after Extended Shutdown

1. Turn OFF all electrical input power to the unit with the external disconnect.
2. Open the access door to locate the humidifier.
3. Check to see the humidifier has not been damaged and the installation has not been altered.
4. Clean the fill strainer.
5. Replace the humidifier fuses.
6. Open the supply water shut-off valve.
7. Turn ON the electrical input power to the unit with the external disconnect.
8. Turn the ON/OFF/Drain switch to the “ON” position.
9. Follow the normal start up procedure for humidifier. See the humidifier IOM.
10. Check water make-up valve, lines, cylinder and hoses for leaks, repair if required.

7.8 Humidifier Drain Pan

To ensure proper humidifier drainage, inspect the drain pan regularly.

1. Make sure the drain pan outlet is always free of debris and ensure the drain pan does not leak.
2. Check p-trap for proper operation and leaks.
3. Clean out drain pan as needed.

7.9 Condensate Pump

The condensate pump should be inspected semi-annually and cleaned.

1. Wipe the float with a wet cloth and detergent to remove dirt.
2. Clean the tank bottom. Remove sump and clean with a stiff nylon brush and flush with water.
3. Check that the discharge line is open, and water can pass through it freely.
4. Check and clear obstructions in gravity lines leading to condensate pump.
5. Check operation of float(s) for free movement.
6. Inspect and clear clogs in discharge check valve and float mechanism.
7. Reassemble and check for leaks.

7.10 Fuses

Fuses may 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 regarding: 1) amperage, 2) voltage 3) Class and 4) type (fast-acting or time-delay). For instance, compressors and motors are inductive loads which require time delay fuses where electric reheat, and humidifiers are resistive loads requiring fast acting fuses.

7.11 Reheating Elements

Reheating elements do not normally require maintenance. However, 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 an unpleasant odor. To help avoid a problem, periodic cleaning is recommended.

7.12 Refrigerant Filter Drier

Factory installed refrigerant filter driers do not require maintenance or replacement unless the system has been opened. When replacing compressors or other repairs that open the refrigeration system to the atmosphere, it is always advisable to replace the filter drier. The equivalent type and size should be used.
7.13 Cabinet
1. Inspect for moisture or any sign of wetness or dripping that is can being contained by the condensate drain pan. Look for any moisture or signs of previous wetness or dripping inside the cabinet.
2. Look for and replace damaged insulating material and assemblies that where deteriorated.
3. Check door and panel gasket for wear or damage. Repair as needed.
4. Check door hinges for operational. Repair as needed.
5. Check structural members. Contact our Service Department for any structural damage.

7.13.1 Exterior Cabinet Maintenance - Cleaning
1. Use a dense sponge or a cloth and then wipe with water. Then dry with cloth.
2. Be careful not to scratch the surface while cleaning.
3. Do not use a hard brush, bristles or similar

7.14 Coils
Coils should be inspected semi-annually and cleaned as required.
1. Check for bent or damaged coil fins and repair as necessary. Use a coil fin comb if the coil fin is bent or deformed and is repairable.
2. Check all refrigerant lines for vibration isolation and support as necessary.
3. Check all piping for signs of leaks.
4. Check for condensation, water spot, piping insulation damage, frost or other visual sign of wear or damage.

Periodic inspection of the coil for signs of corrosion and for leaks is recommended. Repair and replacement of the coil and the connecting piping, valves, etc., should be performed as needed by a qualified individual(s).

7.14.1 Coil Cleaning
Comply with EPA and OSHA regulations when cleaning.

Clean the coil from the leaving airside so that foreign material will be washed out of the coil rather than pushed further in. Be sure to carefully read and follow the cleaning fluid manufacturer’s recommendations before using any cleaning fluid.

Using a brush (non-metallic), clean the coil fins of all debris that will inhibit airflow. This can also be done with compressed air or with a commercial coil cleaner.

**NOTICE:** Caution should be exercised in selecting the cleaning solution as well as the cleaning equipment. Improper selection can result in damage to the coil and/or health hazards.

7.15 Piping
1. Clean off any dust or dirt depending on space conditions.
2. Check for any piping buckling or deforming from original position. Repair as needed.
3. Check for any abnormal vibrations. Secure as needed.
7.16 Water/Glycol Cooled System

1. Check glycol level.
2. Check glycol concentration to job site requirement.
3. Check water quality to your design requirements and to your local and national codes.
4. Check water/glycol flow rate is per requirements.
5. Check water regulating valve(s) and other water components for leaks or damage. Repair as needed.
6. Check water Y-strainer filter. Clean as needed.

7.17 Standard Water/Glycol Flow Switch Replacement

**NOTICE.** Must refer to document ship with the flow switch for instructions for installing the paddle.

1. Disconnect all remote electric power source to unit before maintenance or servicing. Use lock-out tag-out protection.
2. Isolate or shut off all water flow to flow switch.
3. See water flow switch installation (attached with flow switch) document for trimming flow paddle instructions.
4. To allow the switch to detect changes in the fluid flow, the flow paddle must not touch the pipe or any restrictions in the pipe.
5. Adjust flow paddles to the size of the pipe used. If needed, trim the large flow paddle at the arc corresponding to pipe size and install.
7.17.1 Mounting the Flow Switch

1. Install the switch so that the cover and interior are accessible.
2. Mount the switch so that the flow of fluid is in the direction of the arrow on the switch casing.
3. Use a pipe union on each side of the flow switch to allow easy removal or replacement.
4. Mount the switch so that the pipe does not extend too far into the flow switch casing.
5. Use pipe thread sealer on male threads only.
6. Do not remove the cover gasket or the wire grommet from the conduit opening.
7. Use only the terminal screws furnished. Using terminal screws other than those provided will void the warranty and may damage the switch.
8. To adjust the setting of the flow switch:

   - Disconnect electrical power source before making electrical connections.
   - Remove the flow switch cover.
   - Turn the adjusting screw clockwise to raise the flow rate. Turn the adjusting screw counterclockwise to lower the flow rate.
   - Replace the cover after completing adjustments.
   - Tighten the cover screws.

7.18 DX Component Repair or Replacement

1. Check refrigerant pressures as needed.
2. Check super heat and sub cooling temperature.
3. Check for refrigerant oil leaks. Repair as needed.
4. Check thermal expansion valve (EEV or TXV), refrigerant distribution tubes, sight glass, filter drier and other refrigerant components for leaks or damage. Repair as needed.
NOTICE. When reclaim, charging and refrigerant handling, follow the EPA and related environmental protection codes including local and national codes. Service technicians must maintain all required permits.

NOTICE. The following information is only for guideline and reference only. This will vary due to variations with refrigerant component size and configuration. Also, may vary due to product improvement or due to special job specifications. This does not apply to field supplied refrigerant component.

NOTICE. This only applies to replacing with the same manufacture, model, size and configuration as the original component.

5. Turn OFF all remote electric power sources to the unit. Use lock-out tag-out protection.
6. Remove all compressor and fan motor fuses for safety reasons. Remember to replace after finish with change out.
7. Wear protective goggles and wear required. System contains oil and refrigerant under pressure.
8. Remove and reclaim all refrigerant per your local codes.
9. Use care if returning part to Data Aire Service Department.
10. Clean out all oil or debris from part before shipping back to Data Aire Service Department.
11. Deburr and clean out all joints or connections prior to installing replacement part.
12. Have ready replacement insulation, as required.

7.18.1 Compressor Checklist

- Always check with the operating personnel who are using the equipment to see if there have been any reports of abnormal or erratic operation.
- Install a temporary test gauge set and check the compressor suction and discharge pressures to confirm they are within the normal operating range for the given conditions and the temperature of the condensing medium. If there are any indications of abnormal operation such as short cycling or excessive compressor temperatures, the cause must be found, and the malfunction corrected.
- Check the oil level at the compressor oil sight glass and add oil until the bottom half of the 2 circles are not visible in the sight glass. It should be kept in mind that some slight fluctuation in oil level may occur during an operating cycle. So long as the oil level is maintained well within the sight glass such fluctuations are not harmful.
- If the oil is black in color, the crankcase should be drained, and the oil replaced. If there has been a recent compressor failure on the system and the oil has an acid odor, a fresh filter drier should be installed in the suction line and left in the line for a period of 48 hours. If the oil is still discolored, the suction line filter drier is still discolored, the suction line filter drier element should again be changed.
- Check for any indications of liquid refrigerant flooding such as sweating or frosting of the compressor, rust on the suction service valve or compressor body, tripping of the oil pressure safety control, audible slugging, or excessive foaming in the crankcase. If there is any question as to liquid control, the operation of the
system immediately. Excessive sweating or frosting of the suction line and/or compressor body must be corrected.

- Check for any refrigerant oil leaks. Repair as needed.
- Check compressor mounting bolts are tight.
- Visual check compressor rubber shock mounts for any wear, excessive displacement or damage. Repair as needed.
- Check crankcase heater and wires for wear or damage. Replace or repair if needed.

7.18.2 Fixed Speed Scroll Compressor Replacement

**NOTICE.** Disconnect all remote electrical power sources to the unit. Failure to follow these guidelines could result in serious injury or death. Electrical shock hazard exists. Use lock-out tag-out protection. Wear protective goggles and wear as required per your local codes. System contains oil and refrigerant under pressure.

**NOTICE.** When reclaim, charging and refrigerant handling, follow the EPA and related environmental protection codes including local and national codes. Service technicians must maintain all required permits.

Contact Data Aire Service Department prior to replacing scroll compressor if you have any questions on replacing compressor.

This is only for guideline and reference only. This will vary due to variations with compressor cooling capacity size and configuration (voltage, refrigerant type, etc.). Also, may vary due to product improvement or due to special job specifications. This does not apply to field supplied compressor, special order compressors, tandem or variable speed compressors. This only applies to replacing with the same manufacture, model, voltage, phase, hertz, size and configuration as the original compressor. Identity the cause of compressor failure and make sure that you have taken the proper corrective and preventive action before replacing the compressor.

1. Disconnect all remote electric power source to unit before maintenance or servicing. Be sure to disconnect of wires to the crankcase heater.
2. Remove all compressor and fan motor fuses for safety reasons. Remember to replace after finish with change out.
3. Disconnect electrical connections from the compressor.
4. Refrigerant must be recovered from both the suction and discharge sides of the compressor. Proper recovery procedures must be followed, and the refrigerant must be recovered with an EPA-approved recovery unit. Do not attempt to remove the refrigerant lines from the compressor until you have verified that the refrigerant has been removed from the entire system.
5. Tubes should be cut with a tubing cutter close to the compressor. Do not use a torch or brazing method to disconnect the compressor or tubes.
6. To disconnect refrigerant lines, heat joint areas 2 and 3 slowly and uniformly until braze material softens and the tube can be pulled out of suction fitting.
NOTICE. The area should be vented thoroughly to prevent formation of dangerous fumes which could result from the refrigerant in the presence of an open flame.

7. Remove the mounting bolts which will be reused during compressor replacement and lift the compressor out of the unit.
8. Remove the crankcase heater which will be reused during compressor replacement.
9. Depending on the type of compressor failure, refrigerant components such as filter drier, refrigerant receiver or refrigerant oil separator may need to be replaced. Check these components before servicing the compressor.
10. If the replaced compressor is to be returned, it must be properly sealed to prevent the compressor oil from leaking during return shipment.
11. Allow the compressor to remain open to the atmosphere for 15 minutes to ensure that the compressor oil is completely degassed.
12. Do not hammer the compressor suction and discharge tube fittings flat and braze them closed. These fittings must remain undamaged, so the compressor can be tested by Data Aire Service Department.
13. Braze in short stub tubes to the compressor connections and seal the stub tube ends. Braze with Sil-Fos or equivalent silver copper phosphorus composition brazing material. No soldering allowed.

7.18.2.1 Brazing in the Compressor

1. Mount the original crankcase heater to the compressor housing and secure in place.
2. Lift the compressor into place and secure with the original mounting bolts.
3. The copper coated steel tubes on the scroll compressor can be brazed in virtually the same manner as any copper tube. Any silver-phosphorous copper brazing material with a minimum of 5% silver is preferred; however, 0% silver is still acceptable.
4. The following procedure should be used to braze the tubes to the compressor:
   a. Be sure the tube fitting I.D. and tube O.D. are free of oil and clean prior to assembly.
b. Using a torch, apply heat in area 1. As tube approaches brazing temperature, move the torch flame to area 2.

![Brazing Diagram]

- Heat area 2 until braze temperature is attained, moving torch up and down and rotating around tube as necessary to heat tube evenly. Add braze material to the joint while moving torch around joint to flow braze material around circumference.
- After braze material flows around joint, move torch to heat area 3. This will draw the braze material down into the joint. The time spent heating area 3 should be minimal.

5. Reconnect all electrical wiring to original condition. Compressor must be grounded to true earth ground after replacing original compressor.

6. Check the rotation direction of three phase scroll compressors:
   a. Scroll compressors will compress in one rotational direction only. Direction of rotation is not an issue with single phase compressors, because they will always start and run in the proper direction. Three phase compressors will run in either direction depending upon the phasing of the input power.
   b. Verification of proper rotational direction must be made by observing that the suction pressure drops, and the discharge pressure rises when the compressor is energized. Reverse rotation also results in an elevated sound level as well as substantially reduced current draw compared to forward rotation. Operating a scroll compressor in reverse rotation for an extended period will result in compressor failure.
   c. If the compressor is rotating backwards, reverse any 2 of the 3 input wires will cause the compressor to rotate in the correct direction.

7. Evacuate and charge the system with the specified quantity of refrigerant.
8. Adjust refrigerant level as needed.
9. Check compressor suction and discharge pressure.
10. Check sub cooling and super heat values.
11. Check compressor amps.
12. Check high- and low-pressure switches.
13. Check crankcase heater.
14. Check compressor for vibration, noise or other issues after startup.

7.18.3 Refrigerant Filter Drier

Factory installed refrigerant filter driers do not normally require maintenance. When replacing compressors 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.
Check the color code of the moisture indicator on the sight glass. A positive indication means the filter-drier should be replaced. If the drier is frosted or if there is a perceptible temperature change between the liquid line entering and leaving the drier, an excessive pressure drop in the drier is indicated, and the drier should be replaced.

7.18.3.1 Refrigerant Filter Drier Replacement

1. Disconnect all remote electric power sources to the unit.
2. Remove all compressor and fan motor fuses for safety reasons. Remember to replace after finish with change out.
3. Use lock-out tag-out protection.
4. Wear protective goggles and wear required. System contains oil and refrigerant under pressure.
5. Remove and reclaim all refrigerant per your local codes.
6. Check the replacement refrigerant filter drier is the same manufacture, model or part number and configuration as the original part.
7. Disconnect the refrigerant lines by heating the joint areas slowly and uniformly until braze material softens and the tube can be pulled out of fittings. Use a damp cloth covering the filter drier as a precaution will prevent overheating the valve body
8. Deburr and clean connection lines as needed.
9. Braze the replacement refrigerant filter drier in the same location and configuration as the original part with Sil-Fos or equivalent silver copper phosphorus composition brazing material. No soldering allowed.

10. Use a damp cloth covering the refrigerant filter drier as a precaution will prevent overheating the refrigerant filter drier.
11. Braze replacement refrigerant filter drier to the connecting lines.
12. Direct the flame away from the refrigerant filter drier body and avoid excessive heat on the body of the drier.
13. Evacuate and charge the system with the specified quantity of refrigerant
14. Adjust refrigerant level as needed.
15. Check compressor suction and discharge pressure.
16. Check sub cooling and super heat values.

7.18.4 Thermostatic Expansion Valve (TXV) Replacement

1. Check the replacement thermostatic expansion valve is the same manufacture, model or part number and configuration as the original part.
2. Disconnect the refrigerant lines by heating the joint areas slowly and uniformly until braze material softens and the tube can be pulled out of fittings. Use a damp cloth covering the thermostatic expansion valve as a precaution will prevent overheating the valve body.
3. Deburr and clean connection lines as needed.
4. Install the replacement thermostatic expansion valve in the same location and configuration as the original valve.
5. The equalizer must be in the install in the same orientation and location as the original.
6. The thermostatic expansion valve bulb must be installed in the same location and same orientation is extremely important to the proper performance of the system.

| NOTICE | The area should be vented thoroughly to prevent formation of dangerous fumes which could result from the refrigerant in the presence of an open flame. |

7. Braze the replacement valve in place using Sil-Fos or equivalent silver copper phosphorus composition brazing material.
8. Use a damp cloth covering the thermostatic expansion valve as a precaution will prevent overheating the valve body which could damage the superheat spring and result in flood back problems.
9. Braze the replacement thermostatic expansion valve to the connecting lines.
10. If when brazing a brass refrigerant distributor to the valve, braze with Sil-Fos or equivalent silver copper phosphorus composition brazing material. No soldering allowed.
11. Direct the flame away from the thermostatic expansion valve body and avoid excessive heat on the diaphragm. As an extra precaution, a wet cloth may be wrapped around the body and element during brazing operation.
12. Evacuate and charge the system with the specified quantity of refrigerant.
13. Adjust refrigerant level as needed.
14. Check compressor suction and discharge pressure.
15. Check sub cooling and super heat values.
16. If adjustment is necessary on the thermostatic expansion valve, always tighten the adjusting stem packing nut and replace the seal cap tightly.

7.18.5 Refrigerant Liquid Line Solenoid Valve (LLSV) Replacement

7.18.5.1 Remove the Solenoid Valve:
1. Disconnect all remote electric power sources to the unit.
2. Remove all compressor and fan motor fuses for safety reasons. Remember to replace after finish with change out.
3. Use lock-out tag-out protection.
4. Wear protective goggles and wear required. System contains oil and refrigerant under pressure.
5. Remove and reclaim all refrigerant per your local codes.
6. Check the replacement solenoid valve is the same manufacture, model or part number and configuration as the original part.
7. Note the direction of flow is indicated by an arrow or the word IN on the inlet of the valve body.
8. Disconnect all electrical wires from the solenoid valve. Check for wear or damage to the wires. Repair or change out as needed.
9. Disconnect the refrigerant lines by heating the joint areas slowly and uniformly until braze material softens and the tube can be pulled out of fittings. Use a damp cloth covering the solenoid valve as a precaution to prevent overheating the valve body.

10. Deburr and clean connection lines as needed.

11. Remove actuator and to be reinstalled after brazing in valve body to line connections.

12. Use a damp cloth covering the solenoid valve body as a precaution to prevent overheating the valve.

**NOTICE.** The area should be vented thoroughly to prevent formation of dangerous fumes which could result from the refrigerant in the presence of an open flame.

7.18.5.2 Replace the Liquid Line Solenoid Valve:

1. Place the replacement solenoid valve in the line, in the proper direction of flow and braze the replacement solenoid valve in the line connections. Must be in the same location and configuration as the original solenoid valve.

2. Braze with Sil-Fos or equivalent silver copper phosphorus composition brazing material. No soldering allowed.

3. The tip of the torch should be large enough to avoid prolonged heating of the connection during the brazing operation. Overheating can also be minimized by directing the flame away from the valve body.

4. When valve body has cooled to room ambient temperature then reinstall valve actuator.

5. Rewire the solenoid valve back to original condition.

6. Evacuate and charge the system with the specified quantity of refrigerant.

7. Adjust refrigerant level as needed.

8. Check compressor suction and discharge pressure.

9. Check sub cooling and super heat values.

10. Test solenoid valve operation with controller.

7.19 Electrical Component Maintenance/Replacement

**WARNING** Risk of electric shock can cause injury or death. Disconnect local and remote electrical power before working within unit.

Customer must provide earth ground to unit, per NEC, CEC and local codes, as applicable. Before proceeding with installation, read all instructions, verify that all the parts are included and check the nameplate to be sure the voltage matches available utility power.

**WARNING** Arc flash and electric shock hazard. Risk of electrical shock could result in injury or death. Disconnect all remote electrical power supplies prior to working on or within the unit. Wear appropriate personal protective equipment per NFPA 70E before working within unit. Use voltmeter to make sure power is turned off before making any electrical connections. Failure to comply can cause injury or death.
7.20 Electrical Control Panel

**NOTICE**. Installation and maintenance to be performed only by qualified personnel who are familiar with this type of equipment.

**CAUTION** Use caution when inspecting the electrical control panel. Turn OFF all electrical power sources.

1. Inspect electrical control panel quarterly or after a short circuit occurrence.
2. If there is an accumulation of dust and dirt, clean out the panelboard by using a brush, vacuum cleaner, or clean lint-free rags. Avoid blowing dust into circuit breakers or other components. Do not use a blower or compressed air.
3. Visually check all conductors and connections to be certain that they are clean and secure. Loose and/or contaminated connections increase electrical resistance which can cause overheating. Such overheating is indicated by discoloration or flaking of insulation and/or metal parts. Pitting or melting of connecting surfaces is a sign of arcing due to a loose or otherwise poor connection. Parts which show evidence of overheating or looseness should be replaced if damaged. Tighten screws or bolts and nuts to component manufacturer’s torque specifications.
4. Contactors should be kept clean and free from dust and other accumulated deposits. Dust can be removed from the contactor by blowing with dry air that is free from lubricants.
5. Check for hairline cracks in contactors, transformer, auxiliary contact mounting bracket, etc.

7.21 Fuses

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

**NOTICE**. Replace fuses with same size, voltage rating Class and type or equivalent. New fuses must be U.L. and CSA approved.

7.21.1 Fuse Replacement

1. Turn OFF power all electric power sources to the unit.
2. Use lock-out tag-out protection.
3. Check replacement fuse to the same size and type as the original fuse. Use only U.L. and CSA approved fuses.
4. Open electrical control panel.
5. Use a voltmeter to confirm there is no power to the unit.
6. Remove faulty fuse with fuse puller, fuse removal tool or equal.
7. Handle new fuse with care. Do not drop or throw.
8. Install new fuse into fuse holder.
9. Align fuse end with end of fuse holder clips.
10. Turn ON power and verify that operation has been restored.

7.22 Electric Reheat with Modulating SCR Control (Special Option)

The electric reheat is an open coil type with a frame constructed of galvanized steel. Reheat is installed on the air discharge side of the cooling coil. The reheat helps maintain room dry bulb conditions when the system calls for dehumidification. The reheat section includes primary and may include secondary safety switches to protect the system and unit from overheating. The electric reheat is paired with a solid-state modulating SCR controller for fast and infinitely variable proportional control to precisely control room setpoint and extend heater life. The SCR controller shall come with solid state relays, a status LED and a heatsink.

Reheating elements do not normally require maintenance. However, 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 an unpleasant odor. To help avoid a problem, periodic cleaning is recommended.

7.22.1 Electric Reheat Element Checklist

1. Check wire connections (inside reheat box).
2. Check reheater wires for wear or damage. Repair as needed.
3. Check for any physical damage on the heating element. Repair as needed.
4. Periodic Cleaning:
   a. Turn OFF power all electric power sources to the unit.
   b. Use lock-out tag-out protection.
   c. Use a small portable vacuum cleaner to remove any dust or debris from the reheat elements.
   d. Turn ON power.

7.23 Run or Start Capacitor Replacement

The run or start capacitor for a permanent-split capacitor motor is an important electric device that can lead to serious problems for the system if not operating properly. It is one of the most frequent causes for malfunction of the motor or the compressor. The actual replacement procedure is not very difficult to perform but requires careful attention and good manual skills.

1. Turn OFF all remote electric power source to unit before maintenance or servicing.
2. Use lock-out tag-out protection.
3. Remove all fan motor and compressor fuses for safety reasons. Remember to replace after finish with change out.
4. Time is required for the capacitor charge to dissipate. This may take approximately 30 seconds for the charge to dissipate. Be careful not to touch any electrified parts.
WARNING Do not discharge capacitor using a screwdriver or similar tool. This may damage capacitor and or cause risk of electric shock. Maintenance or Service personnel must be electrically grounded to true earth ground and electrically insulated.

| a. Use a high wattage bleed resistor of about 5 to 50 ohms/V of the working voltage of the capacitor. The wattage bleed resistor size will affect the full discharge time for the capacitor. Bleed resistors are used to discharge capacitors to safe voltage levels after power is removed. Suggest 5% tolerance resistor. |

| b. Check with a voltmeter to make sure there is no power left in the capacitor. Make sure to electrically protect your voltmeter or other electrical metering device. Data Aire is not responsible for any damaged metering device. |

| c. Obtain the same size micro farad capacitance and voltage rating capacitor as the original capacitor. The replacement capacitor must be U.L. and CSA approved. The physical size and shape may vary. The new capacitor must have the same identical performance properties as the original one. |

| d. Make sure to purchase the replacement capacitor with rubber boot. Capacitor boot size and shape will vary with size and type of capacitor. |

| e. Record how the original capacitor is connected to the wires and write down the connections. You want to connect the new capacitor in the same way. Often taking a picture of the original connections is helpful when rewiring. Refer to the unit wiring diagram for reference and guidance. |

| f. Disconnect all wires from the original capacitor and remove the original boot. Insert the wires through the new boot and attach them at their respective places on the replacement capacitor. Alternately, you can carry out this step a wire at a time: disconnect a wire from the original capacitor and connect it to the new device and only then proceed with the next wire. |

| g. Once the wires are all connected, mount the new capacitor in place on the electrical panel. You may need to use new metal mounting strap to fix it in position. |

| h. Check that the wires are connected at their respective places and test the connections by pulling slightly each wire. Tighten as needed. |
i. Slide the capacitor rubber boot over the wire connection to cover all capacitor electrical terminal connections.

j. Turn power back ON and check the operation of the unit by normal startup.

7.24 Definite and General Purpose Contactor Replacement

1. Turn OFF all remote electric power source to unit before maintenance or servicing.
2. Use lock-out tag-out protection.
3. Remove all fan motor and compressor (if installed) fuses for safety reasons. Remember to replace after finish with change out.
4. Standard mounting is through the steel contactor base.
5. Check the replacement contactor to be the same manufacturer, model, size, contact resistive rating, induction load rating, coil voltage, type and any protective device. The replacement contactor must be U.L. and CSA approved. Data Aire does not warranty field provided and installed contactors.
6. Record all wire colors and contactor terminal locations. Often taking a picture of the original connections is helpful when rewiring.
7. Disconnect all wires to the contactor.
8. Check contactor wires and terminals for wear or damage. Repair or replace as needed.
9. Remove all mounting screws from original the contactor.
10. Using the existing fasteners, mount the new contactor to the original surface using all contactor mounting holes locations. Check existing mounting screws for wear or damage. Replace if needed.
11. Check the contactor is not loose and is level.
12. Rewire the new contactor per your recorded data and per unit provided wiring diagram.
13. Check all wire connections to the contactor are tight.
14. Turn power back ON and test contactor for functionality and operation.

7.25 Control and Isolation Transformer Replacement

1. Turn OFF all remote electric power source to unit before maintenance or servicing.
2. Use lock-out tag-out protection.
3. Remove all fan motor and compressor fuses for safety reasons. Remember to replace after finish with change out.
4. Standard mounting is through the steel transformer base.
5. Check the replacement transformer to be the same manufacturer, model, size, load rating, hertz, phase, type and any protective device. The replacement transformer must be U.L. and CSA approved. Data Aire does not warranty field provided and installed transformer.
6. Record all wire colors and contactor terminal locations. Taking a picture of the original connections is helpful when rewiring.
7. Disconnect all wires to the transformer.
8. Check transformer wires and terminals for wear or damage. Repair or replace as needed.
9. Remove all mounting screws from original transformer.
10. Using the existing fasteners, mount the new transformer to the original surface using all transformer mounting holes locations. Check existing mounting screws for wear or damage. Replace if needed.
11. Check the transformer is not loose and is level.
12. Rewire the new transformer per your recorded data and per unit provided wiring diagram.
13. Check all wire connections to the transformer are tight.
14. Turn power back ON and test transformer with volt meter to confirm input and output voltages.

7.26 Plug Fans with Electronically Commutated (EC) Motors (EC)

Plug fan(s) with Electronically Commutated (EC) motors are standard equipment on all gPod floor mounted units. Plug fan(s) with EC motors are maintenance free and only require visual inspection. The motors are sealed, have maintenance free ball bearings and permanent lubrication. The only acceptable service is replacement.

**WARNING** Disconnect all electric power sources to the unit before visually inspecting a plug fan. **DO NOT OPEN THE TERMINAL COVER WITHIN THE FIRST 5 MINUTES AFTER DISCONNECTING OF ALL ELECTRICAL POWER.**

If one of the fan internal safeties are triggered, the motor will stop via electronic controls and an “FAN FAILURE” alarm will be indicated on the dap4 display.

Once the fan is stopped via internal controls, the motor will not restart automatically after the power source is reapplied. The internal electronic controller must be reset by cycling the main electrical power OFF for a minimum of twenty (20) seconds and then turned back ON.

If for any reason the rotor is blocked, the motor will electronically switch off. Before looking for blockage, make certain to disconnect all electrical power sources to the unit. Once the blockage is cleared the motor will automatically restart when power is turned back on.

If there is an alarm condition indicated as “NO AIRFLOW”, all active functions (cooling, heating and humidification) will stop until the alarm is cleared.

If any form of trouble-shooting service is required inside the fan motor terminal box, do not open the plug fan terminal cover within the first 5 minutes after turning OFF the electrical power to the unit.

**NOTICE.** The controller has a time delay before the NO AIRFLOW alarm is energized. The alarm is adjustable from 5 to 180 seconds, in 5 second increments. On site where a voltage problem is known to exist, the delay can be adjusted to eliminate “nuisance” alarms until the problem is corrected.
7.27 Smoke Detector Maintenance

7.27.1 Smoke Detector Testing

**NOTICE.** The smoke detector must be tested and maintained regularly per NFPA 72 requirements. Also comply with job site location fire or other applicable compliance codes as required.

Before testing, notify the proper authorities and personnel that the smoke detector system is undergoing maintenance and will temporarily be out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms. Detectors must be tested as part of periodic maintenance. Check to ensure the LEDs blink. If they do not, the detector has lost power (check the wiring), it is defective (return it for repair), or the detector sensitivity is outside the listed limits.

7.27.1.1 Test Magnet Method

Place the magnet against the cover in the location designated by the raised mark to activate the test feature. The LEDs should latch ON within 5 seconds indicating alarm and annunciating the panel.
7.27.2 Cleaning Smoke Detector

The detector should be cleaned at least once a year. Disconnect all remote electric power source to unit before maintenance or servicing. Before removing the detector, notify the proper authorities that the smoke detector system is undergoing maintenance and will be temporarily out of service.

1. Disable the zone or system undergoing maintenance to prevent unwanted alarms.
2. Turn OFF all remote electric power source to unit before maintenance or servicing.
3. Use lock-out tag-out protection.
4. Remove the sensor cover by pressing firmly on each of the four removal tabs that hold the cover in place.
5. Vacuum the screen carefully without removing it. If further cleaning is required continue with additional steps, otherwise skip the following steps.
6. Remove the chamber cover/screen assembly by pulling it straight out.
7. Use a vacuum cleaner or compressed air to remove dust and debris from the sensing chamber.
8. Reinstall the chamber cover/screen assembly by sliding the edge over the sensing chamber. Turn until it is firmly in place.
9. Replace the cover using the LEDs to align the cover and then gently pushing it until it locks into place.
10. Turn the power back ON and test the detector as described in Smoke Detector Testing.
11. Notify the proper authorities that the system is back on line.

7.28 Controls

1. Turn OFF all remote electric power source to unit before maintenance or servicing.
2. Use lock-out tag-out protection.
3. Check all electrical connections for secure fit and any signs of wear. Repair as needed.
4. Remove any dust from dap4 exterior areas. Use care to prevent any damage to electrical components or connections.
5. Check/verify the Mini-dap4 or dap4 controller operation (i.e., sequence).
6. Check for any alarm operation.
7. Check setting/operation.
8. Check/test changeover device(s).
9. Check disconnect switch operation (if installed).
7.29 Temperature and Humidity Sensor Maintenance

The temperature and humidity sensor require very little maintenance. Periodically check the aeration slits on the sensor to make sure that air can flow freely through, without obstructions due to impurities or dust. If cleaning is required do not use ethyl alcohol, hydrocarbons (petrol), ammonia and derivatives. Use neutral detergents and water.

7.29.1 Disposal of Temperature and Humidity Sensor

If the sensor is not returned to Data Aire, the sensor is made up of electrical components, plastic parts and metal parts. Do not dispose of the device as commercial waste. All the parts must be disposed of according to your EPA or local/national applicable disposal codes.

**NOTICE.** Replacement temperature and humidity sensor must be the same model and type as the original. Replacement temperature and humidity sensor may be ordered from the Data Aire Parts department. Contact Data Aire Parts Department for details. Other source or equal sensor may void any warranty and may cause issues.

7.30 Mini-dap4 or dap4 Controller Replacement

When a Mini-dap4 or dap4 replacement controller is ordered from the Data Aire Parts department, the controller is programmed and set to the original settings “as shipped” from the factory. If field adjustments to the settings have been made, these must be recorded to be reloaded after the new controller is in place and operational.

1. Turn OFF all remote electric power source to unit before maintenance or servicing.
2. Use lock-out tag-out protection.
3. Record all connection to the Mini-dap4 or dap4 controller. Use this information and data for rewiring the replacement dap4. Often taking a picture of the original connections is helpful when rewiring.
4. An electrical diagram of the Mini-dap4 or dap4 connections will come with the new controller to assist in making the proper connections.
5. Unplug the existing connections.
6. The controller is DIN rail mounted so remove the controller using a screwdriver to release the mounting clips along the top and bottom sides.
7. Mount the new controller to the existing DIN rail using a flat blade screwdriver to actuate the mount clips along the top and bottom sides. Make sure the new controller is securely fastened to the electrical panel.
8. Plug the existing connectors to the new controller using the recorded information and pictures. Also use the provided electrical diagram as additional guidance.
9. Check all the wires are tightly fastened to the Mini-dap4 or dap4 connectors.
10. If replacing the original display with the new display, disconnect the telephone cable type connector and remove the display.
11. Mount the new display using the original fasteners and plug the telephone cable type connector into the new display.
12. Always use the factory provided display cable. This cable looks like a telephone cable; do NOT replace it with a telephone cable.
13. Check all the wiring connections before restarting the unit. Refer to unit wiring diagram.
14. Test the unit functions before turning the Mini-dap4 or dap4 controller on by performing the following procedure.
   a. Temporarily disconnect the J1 connector off the dap4 control module, turn the unit power ON.
   b. Use the switches on the Manual Override Switch Board to turn on one function at a time (fan, cool, heat, humidifier) to make sure they run properly.
15. After the manual override testing, turn the power OFF and reconnect the J1 connector back to the dap4 or Mini-dap4 control module.
16. Turn the unit power back ON and wait for about 30 seconds for the dap4 or Mini-dap4 to go through its self-test. During this time, the backlit display will light without text. After the self-test, the dap4 will display text. Press and hold the ESC key for 5 seconds to start the unit.
17. If field adjustments to the settings have been made, these must be reloaded after the new controller is in place and operational. Refer to dap4 or Mini-dap4 User Manual for programming details.
18. Check all sensors and options are operating correctly.

8 Low Ambient Receiver Package

<table>
<thead>
<tr>
<th>NOTICE</th>
<th>The pressure relief valve line must be vented to the atmosphere per latest of ASHRAE Standard 15 and or any local Building, Fire, or Mechanical Codes.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>NOTICE</th>
<th>As a minimum, the installer should wear thermal protective gloves and face-shield/goggles when working with refrigerant. Application of excessive heat to any component will cause extreme pressure and may result in a rupture. Exposure of refrigerant to an open flame or a very hot surface will cause a chemical reaction that will form a highly poisonous and corrosive gas commonly referred to as PHOSGENE. In its natural state, refrigerant is a colorless, odorless vapor. It is heavier than air and will disperse rapidly in a well-ventilated area. In an unventilated area, it presents a danger.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>NOTICE</th>
<th>Before carrying out the pressure test, precautions shall be taken to evacuate all personnel from the area of risk and post notices advising that the system or equipment is under pressure.</th>
</tr>
</thead>
</table>
8.1 Refrigerant Receiver

The function of a Liquid Refrigerant Receiver is to store liquid refrigerant to provide continuous flow of liquid refrigerant to the expansion device and to provide storage for the refrigerant charge during system service or maintenance.

A receiver is required to store refrigerant during warmer weather. The receiver should be sized so it is at 80 to 82% of capacity while containing the entire system charge. Another aspect of receivers is that they contain both liquid and gaseous refrigerant at the same time. By their design, receivers prohibit liquid sub-cooling from occurring. Without liquid sub-cooling the capacity of the system is reduced, and care must be taken in the design of the liquid line to avoid flashing at the TX valve.

Flooded systems are an excellent method of providing head pressure control in cold climates, but they increase initial cost, add complexity to the refrigeration system, increase installation time, and increase the refrigerant charge. The loss of sub-cooling should be recognized. If a flooded system is required, consult the manufacturer prior to installation.

8.2 Applications

Liquid refrigerant receivers are installed in air conditioning and refrigeration systems. The receiver is installed after the condenser to collect the condensed refrigerant to allow a continuous liquid supply to the expansion device. Liquid receivers are also used to store the refrigerant charge while the system is pumped down for service or maintenance.

NOTE: For applications below 0°F (-17.8°C), low ambient receiver packages are required.

8.3 Selection Guidelines

Receiver storage capacities are based on the liquid occupying no more than 90% of the internal volume when the temperature of the refrigerant is 90°F (32°C) per ASHRAE Standard 15-78. Receivers should be selected based on the operating charge for all system components, including the liquid lines. It is usual to add a small percentage to
cover the refrigerant in long runs of suction and discharge lines, etc. It is essential that the maximum operating charge be determined, e.g., winter charge in air cooled condenser having flooded head pressure control, this being much greater than the normal summer charge.

8.4 Safety Relief Devices

A refrigerant safety relief device is designed to prevent pressure in a receiver from rising above a safe limit when operating controls fail or when the receiver is exposed to excessive heat. When a receiver, containing liquid refrigerant, is shut off from other parts of the system a rise in temperature will cause a rise in pressure. If the receiver is filled with liquid a small rise in temperature will cause a rapid and excessive rise in pressure due to the expansion of the liquid. If the receiver contains both liquid and vapor, which is normal for refrigerant receivers, the pressure will rise according to the temperature-pressure saturation characteristic of the refrigerant. If pressure builds up high enough to cause the receiver to rupture, large quantities of liquid refrigerant are released. This causes a sudden reduction of pressure so that the liquid released is vaporized almost instantly with explosive results. With a suitable relief device installed on the receiver, the refrigerant is released at a controlled rate and a safe pressure is maintained in the receiver.

**NOTE:** After a “Direct Type” relief device has discharged once, it should be replaced. Be safe and replace the device after such an occurrence.

8.5 Refrigerant Receiver Installation

1. Install the liquid refrigerant receiver after the condenser and before the liquid line filter drier.
2. An NPT fitting is provided on select models at the top of the receiver for installation of a pressure relief device. The installer must ensure the receiver is protected from over-pressure.
3. A 1/8 NPT fusible plug is included on select models to protect the receiver from over-pressure due to excessive heat. Replace the fusible plug immediately if the stamped temperature rating is exceeded.

8.6 Head Pressure Control

The receiver has a head pressure control valve to maintain flooded condenser control. A receiver with pressure control is provided for each circuit.

8.7 Receiver Levels

Identify and log the refrigerant level of the receiver of each refrigeration system using the Data Aire Monthly Refrigerant Receiver Level Table. Be sure the refrigeration systems are not in winter flooding mode, or any other condition that could affect receiver level. Compare the current refrigerant level with levels logged during previous checks. A drop in the receiver level from a previous reading may indicate a leak in the system. A significant drop in refrigerant level must be the result of a significant leak. Do not stop at the first leak found, especially if it is a seeping connection or valve stem leak. Continue searching until a significant leak is found.

If a receiver is being used in a system for low ambient head pressure control, additional refrigerant will be required. See below for the approximate receiver capacities. Note that receivers should not be filled more than 90% of full internal volume.

<table>
<thead>
<tr>
<th>Refrigerant Receiver Internal Volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Tons Per Receiver</td>
</tr>
</tbody>
</table>
8.8 Receiver Heaters

All low ambient receiver packages come with electric band-type heaters to maintain a minimum internal refrigerant temperature to allow cold ambient starting. The heater thermostat, normally located inside the electrical control panel on the condenser, is factory set for 50°F. It may be adjusted in the field but not recommended unless needed for specific design conditions. All receivers are insulated for to help maintain the internal refrigerant temperature during cold ambient outdoor conditions. The heaters are wired single phase and powered by the condenser power source.

8.9 Receiver Heater Electrical Wiring

1. Wire per the condenser wiring diagrams
2. The receiver heaters are powered by the condenser power source.
3. The circuit 1 receiver is wired to terminal block TB3-1 and TB3-2 inside the condenser electrical enclosure.
4. The circuit 2 receiver is wired to terminal block TB3-3 and TB3-4 inside the condenser electrical enclosure.
5. Two wires are required for the thermostat temperature sensor which is mounted on the bottom of each receiver.
6. The thermostat temperature sensor(s) must be connected to the thermostat terminal “SEN” and “COM”.
7. Use only shielded cable for sensor wires.
9  gPod Additional Features

The gPod models are specifically suited for agricultural grow applications. Therefore, the gPod product comes standard with additional features such as lighting sensor-based or time-based control, CO₂ level control, and night time temperature and humidity setpoint. There is additional use and setup information in the dap4 and Mini-dap4 User Manual.

9.1  Day/Night Control

A lighting sensor is provided and must be remote mounted during field installation. The sensor requires 18 AWG wire. The sensor has a conduit base for easy mounting on junction boxes and conduit fittings. This option controls different temperature and humidity setpoints for day and night operation.

9.2  CO₂ Control

The CO₂ option allows the gPod unit to control, monitor, and display alarms for CO₂ levels. The package includes a CO₂ sensor, a 24VDC power supply, a 3/8” dispersion tube located in the existing air stream, and a solenoid valve which are all pre-mounted and wired inside the unit during factory build. The CO₂ generators or CO₂ bottle must be field supplied by the end user. Piping and connection to the CO₂ supply port on the gPod unit must be field supplied by the installing contractor. The CO₂ recommended operating pressure is 20 PSIG. Operating at higher CO₂ supply pressures may make CO₂ control more difficult. The solenoid valve is limited to a maximum operating pressure of 90 PSIG. Frequency and length of bursts of CO₂ is user adjustable via the dap4 or Mini-dap4 controller settings to maintain CO₂ levels.
10 Warranty Policy

See the hardcopy Warranty Statement which is provided in the warranty/information packet which is located inside the electrical control panel of each Data Aire unit.
11 Contact Data Aire

Address: Data Aire, Inc.
230 West Blueridge Avenue
Orange, CA 92865

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

E-mail: Service@dataaire.com
Engineering@dataaire.com
Sales@dataaire.com

Website: www.dataaire.com

Fax: (714) 921-6010 Main
(714) 921-6022 Parts Sales

Job/Unit Information:

Data Aire Job Number: ________________________________

Evaporator Serial Number: ______________________________

Evaporator Model Number: ______________________________

Condenser/Fluid Cooler Serial Number: ______________________________

Condenser/Fluid Cooler Model Number: ______________________________
12 Superheat and Suction Pressure Troubleshooting Guide

12.1 Low Suction Pressure and High Superheat

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

12.2 High Suction Pressure and Low Superheat

1. TXV seat leaking
2. Low superheat adjustment
3. Improper bulb installation
   a. Poor thermal contact
   b. Warm location
4. Wrong thermostatic charge
5. Bad compressor – low capacity
6. Moisture, wax, dirt in system
7. Incorrectly located external equalizer

12.3 Low Suction Pressure and Low Superheat

1. Low load
   a. Insufficient air flow
   b. Dirty air filters
   c. Coil icing
2. Poor air distribution
3. Poor refrigerant distribution
4. Improper compressor/evaporator balance
5. Evaporator oil logged
## Maintenance Inspection Checklist

### Monthly Maintenance Inspection Checklist

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Serial No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Prepared by:** See signature line below

### Air Filters
- [ ] Check for restricted air flow
- [ ] Check for water leaks
- [ ] Check for restricted air flow

### Blower Section (if applicable)
- [ ] Blower wheel free of debris moves freely
- [ ] Check belt tension and condition
- [ ] Bearings in good condition
- [ ] Check pulleys and motor mounts

### Condensate Drain and Pump (if applicable)
- [ ] Check for water leaks
- [ ] Check for restricted air flow
- [ ] Pump operation

### Steam Generating Humidifier (if applicable)
- [ ] Check canister for deposits and water level
- [ ] Check condition of steam hose and clamps

### Air Distribution Section
- [ ] Check for restriction in grille(s)
- [ ] Check contractor operation
- [ ] dap4 or Mini-dap4 controller operations

### Electrical Panel
- [ ] Check contractor operation
- [ ] dap4 or Mini-dap4 controller operations

### Compressor
- [ ] Check for leaks
- [ ] Check for leaks
- [ ] Check for leaks

### Refrigeration Cycle/Section
- [ ] Check crank case temperature
- [ ] Reheat No. 1
- [ ] Reheat No. 2
- [ ] Reheat No. 3

### Air Cooled Condenser (if applicable)
- [ ] Condenser coil clean
- [ ] Motor mounts tight
- [ ] Motor fan bearings in good condition
- [ ] Refrigeration lines properly supported

### Equipment Runtimes
- Condenser: _________ hours
- Compressor: _________ hours
- Reheat No. 1: _________ hours
- Reheat No. 2: _________ hours
- Reheat No. 3: _________ hours
- Humidifier: _________ hours
- Dehumidification: _________ hours
- Energy Saver: _________ hours
- Reset all to read zero runtimes

### Water/Glycol Fluid Cooler (if applicable)
- [ ] Water regulating valve function
- [ ] Check for water/glycol leaks (piping area)

### Temperature/Humidity set at: ___° ___% RH

### Glycol Pump(s) (if applicable)
- [ ] Glycol leaks (pump area)
- [ ] Pump operation
- [ ] Auto air vent clean of mineral deposits
<table>
<thead>
<tr>
<th>Maintenance Inspection Checklist</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quarterly Maintenance Inspection Checklist</strong></td>
<td></td>
</tr>
<tr>
<td>Model No.</td>
<td>Serial No.</td>
</tr>
<tr>
<td>Prepared by:</td>
<td>See signature line below</td>
</tr>
</tbody>
</table>

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

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

**Blower Section** (if applicable)
- ☐ Blower wheel free of debris moves freely
- ☐ Check belt tension and condition
- ☐ Bearings in good condition
- ☐ Check air flow safety switch operation
- ☐ Check pulleys and motor mounts

**Steam Generating Humidifier** (if applicable)
- ☐ Check canister for deposits and water level
- ☐ Check condition of steam hose and clamps
- ☐ Check drain and fill valve for deposits
- ☐ Check high limit switch operation

**Reheat** (if applicable)
- ☐ Inspect blower wheel and torque setting on set screw
- ☐ Check reheat element(s) for dust

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

**Compressor**
- ☐ 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 operation
- ☐ Check solenoid valve operation

**Electrical Panel**
- ☐ Check fuses
- ☐ Check contactor operation
- ☐ Check all electrical connections
- ☐ Check operation sequence
- ☐ Check calibration of change over thermostat

**Air Cooled Condenser** (if applicable)
- ☐ Condenser coil clean
- ☐ Water regulating valve function
- ☐ Check solution _____%
- ☐ Check for water/glycol leaks (piping area)
- ☐ Water/Glycol flow switch operational

**Sensors**
- ☐ Compressor _____ hours
- ☐ Reheat No. 1 _____ hours
- ☐ Reheat No. 2 _____ hours
- ☐ Reheat No. 3 _____ hours
- ☐ Humidifier _____ hours
- ☐ Dehumidification _____ hours
- ☐ Energy Saver _____ hours

**Glycol Pump(s)** (if applicable)
- ☐ Glycol leaks (pump area)
- ☐ Pump operation
- ☐ Reset all to read zero runtimes
- ☐ Temperature/Humidity set at: ___* ___% RH
- ☐ Auto air vent clean of mineral deposits

X
## Index

### A

- Address ........................................................................................................................................... .80
- Air Conditioning Refrigeration (ACR) ................................................................................................. .12
- Air filter ........................................................................................................................................... 49, 81
- Air filter replacement ......................................................................................................................... .49
- Air vents ........................................................................................................................................... 19
- Air-cooled systems ................................................................................................................................. .26
- AirSeal .................................................................................................................................................. 3
- Auxiliary control wiring ..................................................................................................................... .35

### B

- Bearings .............................................................................................................................................. .48
- Belts ..................................................................................................................................................... .48

### C

- Charging ............................................................................................................................................ 26, 27, 28, 29
- Circuit breaker ........................................................................................................................................ .33
- CO₂ control ........................................................................................................................................... 1, 78
- Coil cleaning ......................................................................................................................................... .56
- Coils .................................................................................................................................................... .56
- Compressor replacement .................................................................................................................... .60
- Condensate .......................................................................................................................................... .21
- Condensate probe ................................................................................................................................ .38
- Condensate pump ................................................................................................................................. 22, 37, 55
- Condensate trap .................................................................................................................................... .22
- Contact Data Aire .................................................................................................................................. 45, 51, 60, 73, 80
- Control and Isolation Transformer Replacement .................................................................................. .69
- Controller ............................................................................................................................................ .34, 43, 47, 73
- Controls ............................................................................................................................................... .43, 72

### D

- dap4 .................................................................................................................................................. ii, 1, 4, 21, 29, 39, 43, 46, 47, 48, 49, 70, 72, 73, 74, 78
- dap4 or Mini-dap4 User Manual ........................................................................................................... .74
- Data Aire Job Number ............................................................................................................................. .80
- Day/Night Control .................................................................................................................................. .78
- Definite and General Purpose Contactor Replacement ........................................................................... .69
- Discharge check valves ......................................................................................................................... .14
- Discharge lines ...................................................................................................................................... .14, 15
- Disconnect switch ................................................................................................................................. 2, 9, 33, 34, 38, 46, 72

### E

- Electric .................................................................................................................................................. 5, 66, 67
- Electric reheat ........................................................................................................................................ .66
- Electrical ............................................................................................................................................... 9, 31, 32, 60, 65, 66, 77
- Electronically Commutated (EC) Motors ............................................................................................. .47, 70
Minimum Circuit Ampacity (MCA) ................................................................. 33
Model Number ...................................................................................... 80
Modulating SCR Control ................................................................. 67
Monthly Maintenance Inspection Checklist ..................................... 82

N
National Electrical Code (NEC) ............................................................ 3
Night/day scheduling ........................................................................ 1
No airflow alarm .............................................................................. 40

O
Outside air .......................................................................................... 4

P
Paperwork ......................................................................................... 2
Piping .................................................................................................... 12
Plug Fans ........................................................................................... 70
Power phasing .................................................................................... 11

Q
Quarterly Maintenance Inspection Checklist .................................... 83

R
Receiver ............................................................................................ 28
Recommended gas velocity ............................................................... 15
Recommended tools ........................................................................ 3
Refrigerant handling ......................................................................... 30
Refrigerant Receiver Internal Volumes ............................................... 76
Reheat .................................................................................................. 55
Remote alarm contacts .................................................................... 36
Remote heat exchanger ................................................................... 11
Remote shutdown ............................................................................. 36
Removing doors and panels .............................................................. 46
Repair or replacement ..................................................................... 58
Replacement ..................................................................................... 73
Run or Start Capacitor .................................................................... 67

S
Safety relief device ............................................................................ 76
Serial Number ................................................................................ 80
Service@dataaire.com ........................................................................ 80
Shutoff valve .................................................................................. 19
Smoke detector ............................................................................... 71
Storage ............................................................................................. 7
Superheat ......................................................................................... 26
Telephone ........................................................................................................................................... 80
Temperature and humidity sensor ....................................................................................................... 37, 73
Thermostatic Expansion Valve (TXV) .................................................................................................... 63

Under-Floor water detection cable ........................................................................................................ 38
Upflow ..................................................................................................................................................... 5
User Manual .......................................................................................................................................... 78

Version history ....................................................................................................................................... ii
Voltage ...................................................................................................................................................... 33

Warranty .................................................................................................................................................. 79
Water/glycol cooled ................................................................................................................................. 19, 57
Weather ................................................................................................................................................... 75
Website .................................................................................................................................................... 80
Wiring ......................................................................................................................................................... 32, 77
Wiring diagram ......................................................................................................................................... 39
www.dataaire.com .................................................................................................................................... 80
gPod

DX, Air, Water or Glycol Cooled
Installation, Operation, & Maintenance Manual

Ceiling and Floor Mounted

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

www.dataaire.com

© Copyright 2019 Data Aire Inc. all pages and content