ACCA Series Chillers
Installation, Operation, & Maintenance

Jetson
Excellence in HVAC
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Safety

Attention should be paid to the following statements:

**NOTE** - Notes are intended to clarify the unit installation, operation and maintenance.

⚠️ **CAUTION** - Caution statements are given to prevent actions that may result in equipment damage, property damage, or personal injury.

⚠️ **WARNING** - Warning statements are given to prevent actions that could result in equipment damage, property damage, personal injury or death.

⚠️ **DANGER** - Danger statements are given to prevent actions that will result in equipment damage, property damage, severe personal injury or death.

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⚠️ **WARNING**

**ELECTRIC SHOCK, FIRE OR EXPLOSION HAZARD**

Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death or property damage. Improper servicing could result in dangerous operation, serious injury, death, or property damage.

- Before servicing, disconnect all electrical power to the furnace. More than one disconnect may be provided.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- Verify proper operation after servicing. Secure all doors with key-lock or nut and bolt.

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⚠️ **WARNING**

**QUALIFIED INSTALLER**

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Startup and service must be performed by a trained service technician. A copy of this manual should be kept with the unit.

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⚠️ **WARNING**

Electric shock hazard. Shut off all electrical power to the unit to avoid shock hazard or injury from rotating parts.
**CAUTION**

PVC (Polyvinyl Chloride) and CPVC (Chlorinated Polyvinyl Chloride) are vulnerable to attack by certain chemicals. Polyolester (POE) oils used with R-410A and other refrigerants, even in trace amounts, in a PVC or CPVC piping system will result in stress cracking of the piping and fittings and complete piping system failure.

**WARNING**

VARIABLE FREQUENCY DRIVES

Do not leave VFDs unattended in hand mode or manual bypass. Damage to personnel or equipment can occur if left unattended. When in hand mode or manual bypass mode VFDs will not respond to controls or Alarms.

1. Startup and service must be performed by a trained service technician.

2. The unit is for outdoor use only.

3. Every unit has a unique equipment nameplate with electrical, operational, and unit clearance specifications. Always refer to the unit nameplate for specific ratings unique to the model you have purchased.

4. READ THE ENTIRE INSTALLATION, OPERATION AND MAINTENANCE MANUAL. OTHER IMPORTANT SAFETY PRECAUTIONS ARE PROVIDED THROUGHOUT THIS MANUAL.

5. Keep this manual and all literature safeguarded near or on the unit.
## Model Number Descriptions

**Digits 1 to 3 — Model**  
ACC = Air-Cooled Chiller

**Digit 4 — Major Revision**  
A

**Digits 5 to 7 — Nominal Capacity**  
010 = 10 Tons  
015 = 15 Tons  
020 = 20 Tons  
025 = 25 Tons  
030 = 30 Tons  
040 = 40 Tons  
050 = 50 Tons  
060 = 60 Tons  
070 = 70 Tons  
080 = 80 Tons

**Digit 8 — Unit Voltage**  
A = 208 V/60 Hz/3 Phase  
B = 230 V/60 Hz/3 Phase  
F = 460 V/60 Hz/3 Phase  
G = 575 V/60 Hz/3 Phase

**Digits 9 — Unit Application**  
A = Air-Cooled Chiller  
B = Air-Cooled Chiller (Low Ambient)  
B = Air-Cooled Chiller (High Ambient)  
D = Heat Pump

**Digit 10 — Steps of Capacity**  
A = Single Circuit - On/Off Compressor  
B = Single Circuit - Tandem Compressors  
C = Single Circuit - Variable Speed Compressor  
D = Circuit 1 - On/Off Compressor; Circuit 2 - On/Off Compressor  
E = Circuit 1 - Tandem Compressors; Circuit 2 - On/Off Compressor  
F = Circuit 1 - Tandem Compressors; Circuit 2 - Tandem Compressors  
G = Circuit 1 - Variable Speed; Circuit 2 - On/Off Compressor  
H = Circuit 1 - Variable Speed; Circuit 2 - Tandem Compressors  
J = Circuit 1 - Variable Speed; Circuit 2 - Variable Speed

**Digit 11 — Refrigerant Type**  
0 = R-410A

**Digit 12 — Unit Efficiency**  
0 = Standard Efficiency  
1 = High Efficiency

**Digit 13 — Design Sequence**  
0 = Factory Assigned

**Digit 14 — Chiller Type**  
0 = Standalone Chiller  
1 = Modular Chiller in Array System

**Digit 15 — Evaporator Heat Exchanger Type**  
0 = Brazed Plate  
1 = Shell and Tube  
2 = High Capacity Brazed Plate  
3 = High Capacity Shell and Tube

**Digit 16 — Evaporator Temp Range**  
0 = Standard Cooling 42 to 65°F [5.5 to 18.3°C]  
1 = Standard Cooling/Ice Making 15 to 65°F [-6.7 to 15.6°C]  
2 = Low Temperature Water (40°F [4.4°C])

**Digit 17 — Evaporator Fluid Type**  
0 = Water  
1 = Propylene Glycol  
2 = Ethylene Glycol

**Digit 18 — Evaporator Flow and Valve**  
0 = Constant Flow - Standalone Unit (No Valve)  
1 = Variable Flow - Standalone Unit (No Valve)  
2 = Constant Flow Array - Manual Balancing/Isolating Valve  
3 = Variable Flow Array - Motorized Isolating valve

**Digit 19 — Air-Cooled Condenser Heat Exchanger Type**  
0 = Microchannel Heat Exchanger (MCHE)  
C = E-Coat Microchannel Heat Exchanger (MCHE)

**Digit 20 — Condenser Fan Control**  
0 = Fixed Speed  
1 = Variable Speed  
2 = Low Sound

**Digit 21 — Condenser Water Heat Recovery**  
0 = No Heat Recovery  
1 = Full Heat Recovery

**Digit 22 — Condenser Heat Recovery Fluid Type**  
0 = None  
1 = Water  
2 = Propylene Glycol  
3 = Ethylene Glycol

**Digit 23 — Heat Recovery Condenser Control Valves**  
0 = None  
1 = Manual balancing/isolating valves  
2 = Motorized Isolating valve

**Digit 24 — Power Feed**  
0 = Single Point Power (5 kA Rating)  
A = Single Point Power (5 kA Rating) + Phase and Voltage Monitor  
B = Single Point Power (100 kA Rating)  
C = Single Point Power (100 kA Rating) + Phase and Voltage Monitor  
D = Power Feed to Each Unit (5 kA Rating)  
E = Power Feed to Each Unit (100 kA Rating) + Phase and Voltage Monitor  
F = Power Feed to Each Unit (100 kA Rating) + Phase and Voltage Monitor

**Digit 25 — Power Connection**  
0 = Terminal Block  
A = Non-Fused Disconnect Switch  
B = Fused Disconnect Switch  
C = High SCCR Fuse Block  
D = Distribution Panel

**Digit 26 — Service Options**  
0 = None  
A = LED Lighted Control Cabinet  
B = Factory Wired 115V Outlet  
C = Field Wired 115V Outlet  
D = LED Lighted Control Cabinet + Factory Wired 115V Outlet  
E = LED Lighted Control Cabinet + Field Wired 115V Outlet
**Digit 27 - Control Style**
- 0 = Master Slave Controller w/ Single Controller per Array
- A = Supervisor Array Controller w/ Controller per Module
- B = Non-Array, Single Unit Controller

**Digit 28 — Local Unit Controller Interface**
- 0 = Keypad with Dot Pixel Display
- B = 15.4” Color Touchscreen

**Digit 29 — Remote BMS Interface (Digital Comm)**
- 0 = None
- 2 = Lon Talk®
- 4 = BACnet® MS/TP
- 5 = BACnet IP
- 6 = MODBUS®

**Digit 30 - Controls Enclosure Location**
- 0 = Blank
- 1 = Left (Facing MCHE header, controls are on left)
- 2 = Right (Facing MCHE header, controls are on right)
- 3 = Front (Facing MCHE header, controls are on front)

**Digit 31 - Blank**
- 0 = Blank

**Digit 32 - Refrigeration Options**
- 0 = None
- 1 = Active Freeze Protection All Circuits
- 2 = Hot Gas Bypass All Circuits

**Digit 33 - Refrigeration Accessories**
- 0 = None
- A = Compressor Isolation Valves
- B = Replaceable Core Filter Driers
- C = Replaceable Core Filter Driers + Compressor Isolation Valves

**Digit 34 - Water Connection**
- 0 = No Header Piping (Heat Exchangers Only)
- 1 = Grooved Pipe Connection, Units Connected Side-to-Side
- 2 = Grooved Pipe Connection, Units Connected End-to-End

**Digit 35 - Water Side Pressure**
- 0 = 150 psi
- A = 300 psi

**Digit 36 - Water Strainer(s)**
- 0 = None
- A = Chilled Water Wye Strainer
- B = Chilled Water Wye Strainer with installation kit
- C = Condenser Water Wye Strainer
- D = Condenser Water Wye Strainer with installation kit
- E = Chilled & Condenser Water Wye Strainer
- F = Chilled & Condenser Water Wye Strainer with installation kit

**Digit 37 - Water Accessories**
- 0 = Chilled Water Flow Switch
- A = Condenser Water Flow Switch
- B = Chilled Water + Condenser Water Flow Switch

**Digit 38 - Free Cooling**
- 0 = No Free Cooling Coil
- 1 = With Free Cooling Coil(s)

**Digit 39 — Sound Attenuator**
- 0 = None
- A = Neoprene Pads
- B = Compressor Sound Blanket(s)
- C = Factory Sound Enclosure Cabinet(s)
- D = Both sound blanket and enclosure
- E = Compressor Sound Blanket(s) + Neoprene Pads
- F = Factory Sound Enclosure Cabinet(s) + Neoprene Pads
- G = Both sound blanket and enclosure + Neoprene Pads

**Digit 40 - Guards**
- 0 = None
- A = Wire Mesh Coil Guards
- B = Base + Coil Wire Mesh Guards
- C = Base + Coil Louvers

**Digit 41 - Exterior Finish & Shipping Splits**
- 0 = Standard Paint, Each Module Packaged Separately
- A = Standard Paint, Modules Assembled for Packaging and Shipment
- B = Custom Paint, Each Module Packaged Separately

**Digit 42 - Warranty**
- 0 = Standard Warranty
- A = Compressor Warranty 2-5 years

**Digit 43 — Special Options**
- 0 = None
- X = With Specials
Digits 5 to 7 — Nominal Capacity
The first numbers of the model string designate nominal tons cooling. Actual capacities will vary with conditions.
010 = 10 Tons
015 = 15 Tons
020 = 20 Tons
025 = 25 Tons
030 = 30 Tons
040 = 40 Tons
050 = 50 Tons
060 = 60 Tons
070 = 70 Tons
080 = 80 Tons
*Note: The nominal capacities reflect the use of R-410A refrigerant and a standard heat exchanger.

Digit 8 — Unit Voltage
All units have single point power blocks with grounding lugs and 12V control circuits.
A = 208 V/60 Hz/3 Phase
B = 230 V/60 Hz/3 Phase
F = 460 V/60 Hz/3 Phase
G = 575 V/60 Hz/3 Phase

Digit 9 — Unit Application
A = Air-Cooled Chiller — Standard air-cooled chiller with optional shell and tube or brazed plate evaporator.
B = Air-Cooled Chiller (Low Ambient) — Air-Cooled chiller with special considerations for operation down to -20°F
B = C = Air-Cooled Chiller (High Ambient) — Air-Cooled chiller with oversized condensers for operation up to 120°F
Digit 10 — Steps of Capacity

A = Single Circuit - On/Off Compressor – One fixed speed compressor on one refrigeration circuit
B = Single Circuit - Tandem Compressors – Two fixed speed compressors on one refrigeration circuit
C = Single Circuit - Variable Speed Compressor – One variable speed compressor on one refrigeration circuit
D = Circuit 1 - On/Off Compressor; Circuit 2 - On/Off Compressor – One fixed speed compressor on first refrigeration circuit; One fixed speed compressor on second refrigeration circuit
E = Circuit 1 - Tandem Compressors; Circuit 2 - On/Off Compressor – Two fixed speed compressors on first refrigeration circuit; One fixed speed compressor on second refrigeration circuit
F = Circuit 1 - Tandem Compressors; Circuit 2 - Tandem Compressors – Two fixed speed compressors on first refrigeration circuit; Two fixed speed compressors on second refrigeration circuit
G = Circuit 1 - Variable Speed; Circuit 2 - On/Off Compressor – One variable speed compressor on first refrigeration circuit; One fixed speed compressor on second refrigeration circuit
H = Circuit 1 - Variable Speed; Circuit 2 - Tandem Compressors – One variable speed compressor on first refrigeration circuit, Two fixed speed compressors on second refrigeration circuit
J = Circuit 1 - Variable Speed; Circuit 2 - Variable Speed - One variable speed compressor on first refrigeration circuit; One variable speed compressor on second refrigeration circuit

Digit 11 — Refrigerant Type

0 = R-410A

Digit 12 — Efficiency

1 = Standard Efficiency
2 = High Efficiency

Digit 13 — Design Sequence

0 = Factory Assigned
**Digit 14 — Chiller Type**

0 = **Standalone Chiller** – ACCA chillers can be applied in standalone applications needing between 10 to 80 tons of cooling. In standalone applications, chiller headers are not required and the “no header” option can be selected in Digit 34.

1 = **Array System** - More than one ACCA modular chiller may be piped together (to form an array of chillers) for higher capacity and/or redundant chiller applications, an array controller package must be provided from the factory. The number of modular chillers that can be physically piped together to form an array and share a common header is limited to approximately 300 total tons or 900 gpm.

**Digit 15 — Evaporator Heat Exchanger Type**

0 = **Brazed Plate** - Brazed plate heat exchangers are one of the most efficient ways to transfer heat. They are designed to provide unparalleled performance with the lowest life-cycle cost.

1 = **Shell and Tube** – Shell and tube heat exchanger with grooved water connection and ¼” closed-cell rubberized insulation.

2 = **High Capacity Brazed Plate** – Oversized brazed plate for 40°F leaving water applications.

3 = **High Capacity Shell and Tube** – Oversized shell and tube heat exchanger for glycol applications.

**Digit 18 — Evaporator Temperature Range**

0 = **Standard Cooling 42 to 65°F [5.5 to 18.3°C]** – The chiller with standard evaporator must not be operated with a leaving water temperature of less than 42°F for a plain water application. The chiller with high capacity evaporator must not be operated with a leaving water temperature of less than 40°F for a plain water application.

1 = **Standard Cooling/Ice Making 15 to 65°F [-6.7 to 18.3°C]** - The dual roles of an ice-making chiller can substantially reduce the installed cost of the system. An ice-making chiller is NOT a conventional chiller with two different leaving-fluid temperature setpoints. An ice-making chiller operates at maximum capacity when in ice-making mode. It continues to operate at maximum capacity until the leaving-fluid temperature reaches the target setpoint. At a 10°F delta across the evaporator, this limit indicates that all of the water inside the ice storage tanks has been frozen. An external signal can be sent to the chiller to reset the chilled water setpoint back to conventional chilled water leaving fluid temperature and the chiller will return to traditional chiller operation.

2 = **Low Temperature Water 40 to 65°F [5.5 to 18.3°C]** – The chiller with standard evaporator must not be operated with a leaving water temperature of less than 42°F for a plain water application. The chiller with high capacity evaporator must not be operated with a leaving water temperature of less than 40°F for a plain water application.
Digit 17 — Evaporator Fluid Type

0 = Water
1 = Propylene Glycol
2 = Ethylene Glycol

Digit 18 — Evaporator Flow and Valves

0 = Standalone Unit – No Valves
2 = Constant Flow Array / Manual Balancing Isolating Valve - For a proper hydronic balance in a constant flow system, manual balancing valves are factory installed in array headers. These valves can also be used to isolate a module in an array for service or cleaning. Constant flow pumping systems utilize a staged cooling system and a constant flow water pumping system. No modules are isolated at part load. Flow from “off” chillers mixes with the flow from active chillers in creating the leaving array temperature. The load may not be less than 25% of the full load in constant flow applications.

2 = Variable Flow Primary / Motorized Isolating Valve - Variable flow systems isolate modules not needed to meet current cooling or heating capacity by isolating modules with a factory installed motorized on-off valve. Variable flow systems utilize compressor staging and motorized isolation valves with a variable flow water pumping system to modulate cooling and water flow to meet chilled water needs and save operating energy costs. Cooling capacity is modulated by staging compressors and isolating modules based on the desired leaving water temperature. Water flow control is field provided and is usually modulated with VFD controlled variable flow primary pumps based on the differential pressure across the water system.

Digit 19 — Condenser Heat Exchanger Type

0 = Microchannel Heat Exchanger (MCHE) – Aluminum coil with aluminum fins
C = E-Coat Microchannel Heat Exchanger (MCHE) – Polymer e-coating applied to the condenser coils. Coating surpasses a 6000-hour salt spray test per ASTM B117-90, yet is only 0.8-1.2 mils thick and has excellent flexibility. Option is intended for use in coastal saltwater conditions under the stress of heat, salt, sand and wind and is applicable to all corrosive environments where a polymer coating is acceptable.

Digit 20 — Condenser Fan Control

0 = Fixed Speed – Air-cooled units can operate down to 35°F by cycling condenser fans.
1 = Variable Speed – Air-cooled units can operate down to 0°F by slowing or stopping condenser fans.
Digit 21 — Condenser Heat Recovery

0 = No Heat Recovery – Chiller operates to maintain chilled water temperature. No secondary condenser heat exchanger is installed.

1 = Heat Recovery – A full capacity brazed plate condenser is provided and instead of rejecting heat to the air-cooled condenser, heat is recovered from the brazed plate heat exchanger and condenser water and can be used in many commercial facilities for preheating incoming air, washing, showering, and other everyday usage. Such facilities include:

- Hospitals, laundry, showers, and sterilization (often separate from other systems)
- Dormitories: laundry, showers, and general usage
- Hotels: laundry, showers, pool heat, and general usage

All of these facilities require large quantities of makeup water that must be heated.

Digit 22— Condenser Heat Recovery Fluid Type

0 = None
1 = Water
2 = Propylene Glycol
3 = Ethylene Glycol

Digit 23 — Condenser Heat Recover Control Valves

0 = None
1 = Manual Valve - For a proper hydronic balance in a constant flow system, manual balancing valves are factory installed in array headers. These valves can also be used to isolate a module in an array for service or cleaning.

2 = Motorized Head Pressure Control Valve - The integral condenser water regulating valve option is available to stabilize and maintain the refrigerant condensing pressure within the operating limits of the ACCA Series modular chiller. The valve will replace one of the manual isolating valves that come standard on every chiller and can also be used to isolate the condenser from the cooling water circuit when needed.

Digit 24 — Power Feed

0 = Single Point Power (5 kA Rating) - This option reduces the amount of installation labor by eliminating the need to run separate power to each module in the chiller array. A single connection point is provided to power the array. With this option, the array of chillers is delivered with a separate power panel enclosure. This separate enclosure includes the electrical lug to land the incoming power cables. The cabinet has circuit breakers for each module in the array. Power wiring will be distributed to each chiller module through a wire chase that is part of each individual chiller control panel. Upon installation, the factory supplied electrical whips
will be routed to each module through control panels. Conduits are also factory provided to encase the power wiring as it is routed between one chiller module and the next.

**A = Single Point Power (5 kA Rating) + Phase and Voltage Monitor** - This option includes the single-point power distribution panel. A factory-installed phase/power monitor designed to protect the chiller from premature failure and damage due to common voltage faults such as voltage unbalance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling is included.

**B = Single Point Power (100 kA Rating)** - Short-circuit current ratings provide the level of fault current that a component or piece of equipment can safely withstand (based on a fire and shock hazard external to the enclosure). A 100kA SCCR can have significant impact in meeting safety and insurance requirements.

**C = Single Point Power (100 kA Rating) + Phase and Voltage Monitor** - This option includes the single-point power distribution panel and each unit is rate for 100ka SCCR. A factory-installed phase/power monitor designed to protect the chiller from premature failure and damage due to common voltage faults such as voltage unbalance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling is included.

**D = Power Feed to Each Unit (5 kA Rating)** – Power is field provided to each chiller module in the array. This is beneficial in applications where redundancy or dual point power is desirable or to allow for smaller electrical feeds instead of a large single electrical feed.

**E = Power Feed to Each Unit (5 kA Rating) + Phase and Voltage Monitor** - This option includes field provided power and an additional factory-installed phase/power monitor designed to protect the chiller from premature failure and damage due to common voltage faults such as voltage unbalance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling.

**F = Power Feed to Each Unit (100 kA Rating)** - Short-circuit current ratings provide the level of fault current that a component or piece of equipment can safely withstand (based on a fire and shock hazard external to the enclosure). A 100kA SCCR can have significant impact in meeting safety and insurance requirements.

**G = Power Feed to Each Unit (100 kA Rating) + Phase and Voltage Monitor** - This option includes field provided power and an additional factory-installed phase/power monitor designed to protect the chiller from premature failure and damage due to common voltage faults such as voltage unbalance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling.

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**Digit 25 — Power Connection**

**0 = Terminal Block** - Terminal Block to land incoming power wiring.

**A = Non-Fused Disconnect Switch** - Non-fusible disconnect switches do not incorporate fuses into their enclosure and provide no circuit protection capability. The purpose of a non-fusible safety switch is to provide an easy means to open and close a circuit.

**B = Fused Disconnect Switch** - Fusible disconnect switches combine fuses with the switch in a single enclosure, providing an easy means to manually open and close the circuit while the fuses protect against overcurrent.
**C = High SCCR Fuse Block** - Short-circuit current ratings provide the level of fault current that a component or piece of equipment can safely withstand (based on a fire and shock hazard external to the enclosure). A 100kA SCCR can have significant impact in meeting safety and insurance requirements.

**D = Distribution Panel Connection = Terminal Block; Module Power Connection = Circuit Breaker** – This feature is used for the single point power options in Digit 25. Factory provided panelboard serves as a power distribution panelboard for chiller array.

**Digit 26 — Service Options**

- **0 = None**
- **A = LED Lighted Control Cabinet** - LED lights provide bright lighting inside enclosure offer with long service life and can provide improve safety and visibility when service inside the enclosure is needed.
- **B = Factory Wired 115V Outlet** – Factory wired electrical box with ground fault interrupter receptacle located within the control panel. The circuit is rated at 10 amps maximum and is factory wired to a step-down transformer and fuse block. The circuit is wired to the line side of the unit power block or power switch permitting use of the outlet while power to the unit is shut off. **Caution: When the power to the unit is disconnected with the factory installed unit power switch, the convenience outlet will remain live.**
- **C = Field Wired 115V Outlet** – Field wired electrical box with ground fault interrupter receptacle, located with the control panel. Receptacle is rated for 20 amps. The outlet must be field wired to a 115 VAC power supply.
- **D = LED Lighted Control Cabinet + Factory Wired 115V Outlet**
- **E = LED Lighted Control Cabinet + Field Wired 115V Outlet**

**Digit 27 — Control Style**

- **0 = Master Slave Controller w/ Single Controller per Array** - This option allows up to six (6) ACCA modular chillers to be controlled and operated. The Master-Slave Array Controller requires only a single controller for the array. This option is beneficial in replacement applications where a single larger chiller, with one controller, is replaced by modular chillers controlled with one controller.
- **A = Supervisory Array Controller w/ Controller per Module** - This option allows up to ten (10) ACCA modular chillers to be controlled and operated. The Supervisory Array Controller requires each module have an individual unit controller. This option is beneficial in applications requiring seven (7) or more modules to be controlled and in applications where chiller uptime is critical. If communication between the individual ACCA modular chiller unit controller(s) and the Supervisory Array Controller is lost, or the Supervisory Array Controller fails, the individual ACCA modular chillers can be shifted into manual mode to operate independent from the Supervisory Array Controller and will maintain a “manual mode” default chilled leaving water temperature set point.
- **B = Non-Array, Single Unit Controller** – Standalone Controller has control board with twelve 0-5vdc sensor inputs, four 5vdc digital inputs, ten 230vac 6.3amp relay outputs, four 0-10vdc
analog outputs, keypad, 128 x 64 dot pixel STN monochrome graphics LCD with 2.8" diagonal viewing area, real time clock, MCS-I/O, RS-232, RS-485 and Ethernet communication ports.

**Digit 28 — Local Unit Controller Interface**

0 = **Keypad with Dot Pixel Display** - keypad, 128 x 64 dot pixel STN monochrome graphics LCD with 2.8" diagonal viewing area  
B = **15.4-in. Color Touchscreen** - Information and graphics are shown on high resolution (1280x800) LCD display with LED back lighting. The high-resolution screen makes it easy for the user to manage complex installations without losing the overall view or requiring a separate laptop. Pages can be navigated in a fast and straightforward manner.

**Digit 29 — Remote BMS Interface (Digital Comm)**

0 = None  
2 = Lon Talk®  
4 = BACnet® MS/TP  
5 = BACnet® IP  
6 = MODBUS®

**Digit 30 — Controls Enclosure Location**

0 = Blank  
1 = Left (Facing MCHE header, controls are on left)  
2 = Right (Facing MCHE header, controls are on right)

**Digit 31 — Blank**

0 = Blank

**Digit 32 — Refrigeration Options**

0 = None  
1 = **Active Freeze Protection (All Circuits)** – Active freeze protection is a suction pressure-based freeze protection. Active Freeze Protection is standard on all ACCA Series chillers. The chiller’s unit controller continually monitors the saturated suction pressure and will open (energize) the Active Freeze Protection solenoid if the suction pressure falls to approximately 101 psig (32°F). The solenoid closes (de-energizes) when the pressure climbs to approximately 105 psig (34°F) and the freezing potential no longer exists.  
2 = **Hot Gas Bypass (All Circuits)** - Hot gas bypass can stabilize the system balance point by diverting hot, high-pressure refrigerant vapor from the discharge line directly to the low-
pressure side of the system. This tactic keeps the compressor more fully loaded while the evaporator satisfies the part-load condition. The Jetson Active Freeze Protection can be configured to function as Hot Gas Bypass by configuring the controller to monitor both the leaving water temperature and the suction temperature. In Hot Gas Bypass operating mode, the Active Freeze Protection provides an additional step of capacity.

Digit 33 — Refrigeration Accessories

0 = Moisture Indicating Sight Glass - The sight glass shows if the liquid line has a full line of liquid or if it has bubbles which shows it’s a liquid/vapor mix. It should not be used to determine proper charge. The moisture indicator shows if the system is dry or if it has harmful moisture content.

A = Moisture Indicating Sight Glass + Compressor Isolation Valves – In addition to the Moisture Indicating Sight Glass, ball type Compressor Isolation Valves are mounted on the cooling circuit discharge and suction lines permitting isolation of the compressor for service or replacement. The valves are located close to the compressors. The valve works through a quarter turn from open to closed. Teflon seals and gaskets are used with a nylon cap gasket to prevent accidental loss. This option reduces the amount of refrigerant that must be recovered during compressor service or replacement since closing these valves isolates the compressor.

B = Moisture Indicating Sight Glass + Replaceable Core Filter Driers - In addition to the Moisture Indicating Sight Glass, Replaceable Core Filter Driers allow for easy changeout of the filter-drier element.

C = Moisture Indicating Sight Glass + Replaceable Core Filter Driers + Compressor Isolation Valves
Digit 34 — Water Connection

0 = No Header Piping (Heat Exchangers Only)
A = Grooved Pipe Connection, Units Connected Side-to-Side – Chillers are set alongside other chillers along the long dimension. A common header is connected between chillers on the short dimension.

D = Grooved Pipe Connection, Units Connected End-to-End – Chillers are set alongside other chillers along the short dimension. A common header is connected through the chillers on the long dimension.

Digit 35 — Water Side Pressure

0 = 150 psi
A = 300 psi

Digit 36 — Water Strainer(s)

0 = None
A = Chilled Water Flow Wye Strainer – Factory provided, field installed wye strainer can be placed in a horizontal or vertical pipeline as long as the screen is in a downward position. Straining is accomplished via a 20-mesh lined straining element.
B = Chilled Water Wye Strainer with Installation Kit - Wye strainer installation kits provide piping transitions needed to easily attach the wye strainer to the chiller.
C = Condenser Water Flow Wye Strainer – Factory provided, field installed wye strainer can be placed in a horizontal or vertical pipeline as long as the screen is in a downward position. Straining is accomplished via a 20-mesh lined straining element.
D = Condenser Water Wye Strainer with Installation Kit - Wye strainer installation kits provide the piping transitions needed to easily attach the wye strainer to the chiller.
E = Chilled and Condenser Water Nominal Flow Wye Strainer
**Digit 37 — Water Accessories**

0 = Chilled Water Flow Switch - An evaporator flow-proving device is required for all ACCA Series chiller applications. A paddle style liquid flow switch is available with a NEMA Type 4X enclosure for field-installation.

A = Heat Recovery Condenser Water Flow Switch - A paddle style liquid flow switch is available with a NEMA Type 4X enclosure for field-installation.

B = Chiller Water and Heat Recovery Condenser Water Flow Switch - A paddle style liquid flow switch is available with a NEMA Type 4X enclosure for field-installation.

**Digit 38 — Free Cooling**

0 = None

1 = With Free Cooling - Free cooling is an economical method of using low external air temperatures to assist in chilling water. When outdoor temperatures are lower relative to indoor temperatures, this system utilizes the cool outdoor air as a free cooling source.

**Digit 39 — Sound Attenuator**

0 = None

A = Neoprene Pads - In applications that are sensitive to noise and vibration, optional neoprene isolator pads can be provided for load bearing points on ACCA chillers.

B = Compressor Sound Blankets - Factory installed Compressor Sound Blankets provide insulated sound covers on each compressor. These blankets dampen compressor generated sound. The blankets can be used alone or in combination with a sound cabinet.

C = Factory Sound Enclosure Cabinet - The sound enclosure is a factory installed option. The panels completely encase the chiller module. The panels, lined with sound absorbing insulation, can be removed for access in case of service and provide a streamlined appearance to the product while in place.

D = Compressor Sound Blankets + Factory Sound Enclosure Cabinet

E = Compressor Sound Blanket(s) + Neoprene Pads

F = Factory Sound Enclosure Cabinet(s) + Neoprene Pads

G = Compressor Sound Blankets + Factory Sound Enclosure Cabinet + Neoprene Pads
Digit 40 — Guards

0 = None
A = Wire Mesh Coil Guards - Optional factory-installed, vinyl-coated, welded-wire guards provide protection for the condenser coils.
B = Base + Coil Wire Mesh Guards - Optional factory-installed, vinyl-coated, welded-wire guards provide protection for the condenser coils and lower portion of the unit.
B = Coil Louvers - Optional factory-installed, louvered panels provide protection for the condenser coils.
C = Base + Coil Louvers - Optional factory-installed, louvered panels provide protection for the condenser coils and lower portion of the unit.

Digit 41 — Exterior Finish and Shipping Splits

0 = Standard Paint, Each Module Packaged Separately – Standard Jetson paint process uses primer wash then spray coated with a two-part polyurethane exterior paint.
B = Custom Paint, Each Module Packaged Separately – Custom colors are available for applications requiring ACCA Series chiller to match existing color palettes.

Digit 42 — Warranty

0 = Standard Warranty – Warranty period is a period of twelve (12) months from date of start-up or eighteen (18) months from date of original shipment, whichever may occur first.
0 = Compressor Warranty (2-5 year) – Additional parts only warranty covering compressor(s) through 5 years from date of shipment.

Digit 43 — Special Options

0 = None
X = With Specials
General Information

Jetson ACCA air-cooled chillers are complete self-contained liquid chilling units. They are factory assembled, wired, charged and run tested. Primary pumping package is available as an optional feature.

⚠️ WARNING
QUALIFIED INSTALLER
Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Startup and service must be performed by a Factory Trained Service Technician.

System should be sized in accordance with the American Society of Heating, Refrigeration and Air Conditioning Engineers Handbook.

Installation of ACCA chillers units must conform to the ICC standards of the International Mechanical Code, the International Building Code, and local building, plumbing and waste water codes. All appliances must be electrically grounded in accordance with local codes, or in the absence of local codes, the current National Electric Code, ANSI/NFPA 70 or the current Canadian Electrical Code CSA C22.1.

⚠️ CAUTION
The Clean Air Act of 1990 bans the intentional venting of refrigerant as of July 1, 1992. Approved methods of recovery, recycling, or reclaiming must be followed.

⚠️ WARNING
Coils and sheet metal surfaces present sharp edges and care must be taken when working with equipment.

⚠️ WARNING
Failure to observe the following instructions will result in premature failure of your system and possible voiding of the warranty.

Receiving Unit
When received, the unit should be checked for damage that might have occurred in transit. If damage is found it should be noted on the carrier’s freight bill. A request for inspection by carrier’s agent should be made in writing at once. Nameplate should be checked to ensure the correct model sizes and voltages have been received to match the job requirements.

If repairs must be made to damaged goods, then the factory should be notified before any repair action is taken in order to protect the warranty. Certain equipment alteration, repair, and manipulation of equipment without the manufacturer’s consent may void the product warranty. Contact Jetson shipping department for assistance with handling damaged goods, repairs, and freight claims: (903) 758-2900.

NOTE: Upon receipt check shipment for items that ship loose, such as sensors. Consult order and shipment documentation to identify potential loose-shipped items. Loose-shipped items may have been placed inside the unit cabinet for security. Installers and owners should secure all doors with locks or nuts and bolts to prevent unauthorized access.
Storage
If installation will not occur immediately following delivery, store equipment in a dry protected area away from construction traffic and in the proper orientation as marked on the packaging with all internal packaging in place. Secure all loose-shipped items.

Failure to observe the following instructions may result in premature failure of your system, and possible voiding of the warranty.

CAUTION
CRANKCASE HEATER OPERATION
Units are equipped with compressor crankcase heaters, which should be energized at least 24 hours prior to cooling operation, to clear any liquid refrigerant from the compressors.

Never turn off the main power supply to the unit, except for complete shutdown. When power is cut off from the unit, any compressors using crankcase heaters cannot prevent refrigerant migration. This means the compressor will cool down, and liquid refrigerant may accumulate in the compressor. The compressor is designed to pump refrigerant gas and damage may occur when power is restored if liquid enters the compressor.

Before unit operation, the main power switch must be turned on for at least 24 hours for units with compressor crankcase heaters. This will give the crankcase heater time to clear any liquid accumulation out of the compressor before it is required to run.

CAUTION
Scroll compressors are directional and will be damaged by operation in the wrong direction. Low pressure switches on compressors have been disconnected after factory testing. Rotation should be checked by a qualified service technician at startup using suction and discharge pressure gauges and any wiring alteration should only be made at the unit power connection.

Wiring Diagrams
A unit specific wiring diagrams in point-to-point form is laminated in plastic and located inside the control compartment door.
CAUTION
FIELD WIRED CONNECTIONS

Some units may require field wired connections. Refer to the wiring diagrams contained within the unit to identify any components or controls requiring additional wiring in the field before placing the unit into service. All additional field wiring should be performed by a trained service technician.

General Maintenance
When the initial startup is made and on a periodic schedule during operation, it is necessary to perform routine service checks on the performance of the condensing unit. This includes reading and recording suction pressures and checking for normal subcooling and superheat.

Primary Pumping Package
Primary pumping uses a single pump to move water or glycol through the evaporator and back to the building. This pumping package provides the necessary flow of water to the system. The pump is activated whenever the chiller is given a run signal.

Water enters the unit through the return water piping, and then the water flows through a suction guide with strainer. Some units will not include a suction guide if there is enough straight piping before the pump. The end of the suction guide is removable for strainer access. The strainer assembly is composed of two parts, the operational strainer, and the startup strainer, (located inside the operational strainer) which is to be removed 24 hours after startup.

The pump is installed after the strainer, and before a combination valve (Flo-Trex). This combination valve acts as isolation valve, check valve, and flow balancing valve. The shell and tube or brazed plate evaporator is placed after the combination valve in the water circuit with a differential pressure switch installed across its inlet and outlet. This pressure switch closes when the differential pressure increases above the setpoint, which should be set 1-2 psig below the pressure drop across the heat exchanger at design flow rate. The closing differential pressure switch signals the control system to indicate flow through the heat exchanger and allow cooling to activate as required to maintain the setpoint. The water exiting the shell and tube or brazed plate evaporator, leaves the unit through the water out connection.

Glycol
Glycol units require a glycol feeder field installed to replace fluid that is lost in the system. Water should not be directly added to glycol applications as this would dilute the glycol concentration and thereby increase the freezing temperature of the fluid.

Compression Tank
As the water temperature in the system increases, the volume that water displaces increases. In order to compensate for these forces, a field provided pre-pressurized diaphragm compression tank that is preset for 12 psig is recommended.

Pressure Relief Valve
Required pressure relief valve is installed on shell and tube evaporator.

Dual Pumps
When redundant pumping is required, a factory installed dualArm pump may be ordered, depending on unit size and options. A dualArm pump is a pump with two independent motors and pumps in a single
casing. This pump has a swing split-flapper valve in the discharge port to prevent liquid recirculation when only one pump is operating. Isolation valves in the casing allow one pump to be isolated and removed for service while the other pump is still operating.

The controls package will activate the pump when the unit is given a run command. If the controls do not recognize flow in 60 seconds, the second pump will be activated and an alarm signal will be generated. If the second pump does not activate, the cooling will be locked out.

Pipe Insulation
The evaporator in the ACCA chiller is factory insulated. The water piping, pumps, and other components on units with pumping packages are not insulated at the factory. Insulation should be installed on the water piping after the system has been checked for leaks.

Installation

Forklifting the unit
Units can be lifted using a forklift. Lifting the unit with forks perpendicular to the long dimension may use forks 48” in length. Lifting of units with forks parallel to the unit’s long dimension must have forks 72” in length or the forks must have 72” fork extensions. Standard units can be lifted from all sides except the evaporator end. Forks must be perpendicular to the unit and they must be in far enough that the back of the forks are no more than 6” away from the edge of the unit.

Lifting the Unit
Do not lift unit from above unless spreader bars are used. Each module should be lifted using lift straps threaded through the steel base cutouts and a spreader bar.

If cables or chains are used to hoist the unit, they must be the same length. Care should be taken to prevent damage to the cabinet, coils, and condenser fans. Before lifting unit, be sure that all shipping material has been removed from unit. Secure hooks and cables at all lifting points / lugs provided on the unit.

Hoist unit to a point directly above the curb or concrete pad. Be sure that the gasket material has been applied to curb.

Carefully lower and align the unit with utility and duct openings. Lower the unit until the unit skirt fits around the curb. Make sure the unit is level and properly seated on the curb or pad.
**WARNING**

**HEAVY OBJECTS**

Failure to follow instructions or properly lift unit could result in unit dropping and possibly crushing operator/technician which could result in death or serious injury, and equipment or property-only damage. Ensure that all the lifting equipment used is properly rated for the weight of the unit being lifted. Each of the cables (chains or slings), hooks, and shackles used to lift the unit must be capable of supporting the entire weight of the unit. Lifting cables (chains or slings) may not be of the same length. Adjust as necessary for even unit lift.

**WARNING**

**IMPROPER UNIT LIFT**

Failure to properly lift unit could result in unit dropping and possibly crushing operator/technician which could result in death or serious injury, and equipment or property-only damage. Test lift unit approximately 2 to 4 inches to verify proper center of gravity lift point. To avoid dropping of unit, reposition lifting point if unit is not level.

**CAUTION**

**IMPROPER UNIT LIFT**

If no, or improperly sized, spreader bar is used, damage to the unit may occur.

**Locating the Unit**

The ACCA chiller is designed for outdoor applications and mounting at ground level or on a rooftop. It must be placed on a level and
solid foundation that has been prepared to support its weight. When installed at ground level, a one-piece concrete slab should be used with footings that extend below the frost line. With ground level installation, care must be taken to protect the coil from damage due to vandalism or other causes. ACCA chillers are available with factory installed condenser coil guards.

The placement relative to the building air intakes and other structures must be carefully selected. Airflow to and from the chiller must not be restricted to prevent a decrease in performance and efficiency.

The installation position must provide at least sufficient clearance for proper airflow to the condenser coils. See Table 1 for individual unit clearances. When units are mounted adjacent to each other, the minimum clearance required between the units is 6 feet.

<table>
<thead>
<tr>
<th>Location</th>
<th>Clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front - (Controls Side)</td>
<td>36”</td>
</tr>
<tr>
<td>Back Side</td>
<td>36”</td>
</tr>
<tr>
<td>Compressor End</td>
<td>24”</td>
</tr>
<tr>
<td>Chiller HXC End</td>
<td>24”</td>
</tr>
<tr>
<td>Top</td>
<td>Unobstructed</td>
</tr>
</tbody>
</table>

Table 1 - Service Clearances

Units should not be installed in an enclosure or pit that is deeper than the height of the unit. When recessed installation is necessary, the clearance to maintain proper airflow is at least 6 feet.

ACCA chillers have a vertical air discharge. There must be no obstruction above the equipment. Do not place the unit under an overhang.

For proper unit operation, the immediate area around condenser must remain free of debris that may be drawn in and obstruct airflow in the condensing section.

Consideration must be given to obstruction caused by snow accumulation when placing the unit.

**Typical Water Piping**
All building water piping must be flushed prior to making final connections to the chiller. To reduce heat loss and prevent condensation, insulation should be applied. Expansion tanks are also usually required so that chilled water volume changes can be accommodated.

**Avoidance of Short Water Loops**
Adequate water volume is an important system design parameter because it provides for stable chilled water temperature control and helps limit unacceptable short cycling of chiller compressors.

The chiller’s temperature control sensor is located in the supply (outlet) water connection or pipe. This location allows the building to act as a buffer to slow the rate of change of the system water temperature. If there is not sufficient water volume in the system to provide an adequate buffer, temperature control can suffer, resulting in erratic system operation and excessive compressor cycling.

Typically, a three-minute water loop circulation time is sufficient to prevent short water loop issues. Therefore, as a guideline, ensure the volume of water in the chilled
water loop is greater than or equal to three times the evaporator flow rate. For systems with a rapidly changing load profile the volume should be increased.

If the installed system volume does not meet the above recommendations, the following items should be given careful consideration to increase the volume of water in the system and, therefore, reduce the rate of change of the return water temperature.

- A volume buffer tank located in the return water piping.
- Larger system supply and return header piping (which also reduces system pressure drop and pump energy use).

**Minimum Water Volume for a Process Application**

If a chiller is attached to an on/off load such as a process load, it may be difficult for the controller to respond quickly enough to the very rapid change in return solution temperature if the system has only the minimum water volume recommended. Such systems may cause chiller low temperature safety trips or in the extreme case evaporator freezing. In this case, it may be necessary to add or increase the size of the mixing tank in the return line.

**Water Connection**

Connect the chiller supply and return water lines. The water connections are schedule 40 grooved black pipe. The maximum operating pressure for the ACCA chiller is 150 psi.

Make sure water piping connections to the evaporator are isolated, and confirm that all piping to unit is supported independently to prevent any load being transferred to the unit. Use unions, flanges or grooved lock type fittings to facilitate service procedures. Use a pipe sealant such as Teflon® tape on all threaded water connections. Use vibration eliminators to prevent transmitting vibrations through the water lines. Construct and install piping in accordance with all local, state and national codes.

Supply and insulate the chilled water piping as required, to prevent sweating and minimize heat gain under normal operating conditions. Chilled water piping must rise above the chiller to ensure the evaporator is full of water and void of air at all times. Install thermometers in the lines to monitor evaporator entering and leaving water temperatures.

ACCA modular chillers have manual balancing ball-valves in the entering water lines. They may be used to establish a balanced water flow. Both the entering and leaving water lines have valves that can be used to shutoff/isolate the evaporator for service.
**WARNING**
The chiller must only be operated only with adequate volume and type of fluid flowing through the evaporators.

**Mounting Isolation**
For roof mounted applications or anytime vibration transmission is a factor, full perimeter vibration isolators may be used.

**Access Doors**
Lockable access doors are provided to the control compartment.

**Electrical**
The single point electrical power connections are made in the electrical control compartment. The microprocessor control furnished with the unit is supplied with its own power supply factory wired to the main power of the chiller.

Check the unit nameplate voltage to make sure it agrees with the power supply. Connect power to the unit according to the wiring diagram provided with the unit.
Table 2 - Nameplate Voltage Markings

<table>
<thead>
<tr>
<th>Voltage Feature</th>
<th>Nameplate Voltage Marking</th>
<th>Min/Max VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>208V/3Φ/60Hz</td>
<td>208</td>
<td>197/228</td>
</tr>
<tr>
<td>230V/3Φ/60Hz</td>
<td>230</td>
<td>197/252</td>
</tr>
<tr>
<td>460V/3Φ/60Hz</td>
<td>460</td>
<td>456/504</td>
</tr>
<tr>
<td>575V/3Φ/60Hz</td>
<td>575</td>
<td>570/630</td>
</tr>
</tbody>
</table>

Note: Units are factory wired for 208V, 230V, 460V, or 575V. The transformer configuration must be checked by a qualified technician prior to startup.

![CAUTION]

3-PHASE ROTATION

Rotation must be checked on all MOTORS AND COMPRESSORS of three phase units. Condenser fan motors should be checked by a qualified service technician at startup and any wiring alteration should only be made at the unit power connection. Variable frequency drives are programmed to automatically rotate the fan in the correct rotation. Do not rely on fans with variable frequency drives for compressor rotation.

Size supply conductors based on the unit MCA rating. Supply conductors must be rated a minimum of 167°F (75°C).

Route power and control wiring, separately, through the utility entry. Do not run power and signal wires in the same conduit.

Protect the branch circuit in accordance with code requirements. The unit must be electrically grounded in accordance with local codes, or in the absence of local codes, the current National Electric Code, ANSI/NFPA 70 or the current Canadian Electrical Code CSA C22.1.

Power wiring is to the unit terminal block or main disconnect. All wiring beyond this point has been done by the manufacturer and cannot be modified without effecting the unit’s agency/safety certification.

Three phase voltage imbalance will cause motor overheating and premature failure. The maximum allowable imbalance is 5%.

Voltage imbalance is defined as 100 times the maximum deviation from the average voltage divided by the average voltage.

Example:
\[
(218V+237V+235V)/3 = 230V, \text{ then } 100 \times (230V-218V)/230V = 5.2\%, \text{ which exceeds the allowable imbalance.}
\]

Check voltage imbalance at the unit disconnect switch and at the compressor terminal. Contact your local power company for line voltage corrections.
WARNING
ELECTRIC SHOCK

Electric shock hazard. Before attempting to perform any installation, service, or maintenance, shut off all electrical power to the unit at the disconnect switches. Unit may have multiple power supplies. Failure to disconnect power could result in dangerous operation, serious injury, death or property damage.

Note: Startup technician must check motor amperage to ensure that the amperage listed on the motor nameplate is not exceeded.

CAUTION
SEALING ELECTRICAL ENTRIES

Installing Contractor is responsible for proper sealing of the electrical entries into the unit. Failure to seal the entries may result in damage to the unit and property.

WARNING
CONVENIENCE OUTLETS AND SERVICE LIGHTS

Convenience outlet and service light circuits are wired to the incoming power side of the disconnect. These circuits will remain powered even when unit disconnect is off.

Startup

Before startup of the chiller make sure that the following items have been checked.

1. Verify that electrical power is available to the unit.
2. Verify that any remote stop/start device connected to the chiller controller is requesting the chiller to start.
3. Verify that liquid flow is present through the chiller from the building.
4. There should be a building load of at least 25% of the chiller capacity in order to properly check operation.
5. Using controller set the leaving water temperature setpoint.
6. Use the general check list at the top of the startup form to make a last check that all the components are in place, water flow is present, and the power supply is energized.
7. Cycle through all the compressors to confirm that all are operating within tolerance.
8. While performing the check, use the startup form to record observations of amps and refrigerant pressures.
9. When all is running properly, use controller to place the controller in the run mode and observe the system until it reaches a steady state of operation.
CAUTION
Rotation must be checked on all MOTORS AND COMPRESSORS of three phase units. All motors, to include and not be limited to pump motors and condenser fan motors, should all be checked by a qualified service technician at startup and any wiring alteration should only be made at the unit power connection.

CAUTION
Before completing installation, a complete operating cycle should be observed to verify that all components are functioning properly.

Maintenance

General
Qualified technicians must perform routine service checks and maintenance. This includes reading and recording the condensing and suction pressures and checking for normal sub-cooling and superheat.

Compressors
The scroll compressors are fully hermetic and require no maintenance except keeping the shell clean.

Refrigerant Filter Driers
Each refrigerant circuit contains a filter drier. Replacement is recommended when there is excessive pressure drop across the assembly or moisture is indicated in a liquid line sight glass.

Table 3 - Max Filter Drier Pressure Drops

<table>
<thead>
<tr>
<th>Circuit Loading</th>
<th>Max. Pressure Drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>10 psig</td>
</tr>
<tr>
<td>50%</td>
<td>5 psig</td>
</tr>
</tbody>
</table>

Evaporator
The evaporators are direct expansion type with an electronic expansion valve to regulate refrigerant. Normally no maintenance or service work will be required.

Adjusting Refrigerant Charge
All ACCA chillers are shipped with a full factory charge. Periodically additional charge may be required.

Charging a system in the field must be based on determination of liquid sub-cooling and evaporator superheat. On a system with an electronic expansion valve, liquid subcooling is more representative of the charge than evaporator superheat but both measurements must be taken.

Before Charging
Refer to the Unit Nameplate as a reference when determining the proper refrigerant charge.

Unit being charged must be at or near full load conditions before adjusting the charge.

After adding or removing charge the system must be allowed to stabilize, typically 10-15 minutes, before making any other adjustments.

The type of unit and options determine the ranges for liquid sub-cooling and evaporator superheat. Refer to Table 4 - Acceptable Refrigeration Circuit Values when determining the proper sub-cooling.
The type of unit and options determine the ranges for liquid sub-cooling and evaporator superheat. Refer to Table 4 - Acceptable Refrigeration Circuit Values when determining the proper sub-cooling.

**Checking Liquid Sub-cooling**

Measure the temperature of the liquid line as it leaves the condenser coil.

Read the gauge pressure at the liquid line close to the point where the temperature was taken. You must use liquid line pressure as it will vary from discharge pressure due to condenser coil pressure drop.

Convert the pressure obtained to a saturated temperature using the appropriate refrigerant temperature-pressure chart. Subtract the measured liquid line temperature from the saturated temperature to determine the liquid sub-cooling.

Compare calculated sub-cooling to Error! Reference source not found. for the appropriate unit type and options.

**Checking Evaporator Superheat**

Measure the temperature of the suction line close to the compressor.

Read gauge pressure at the suction line close to the compressor.

Convert the pressure obtained to a saturated temperature using the appropriate refrigerant temperature-pressure chart.

Subtract the saturated temperature from the measured suction line temperature to determine the evaporator superheat.

For refrigeration systems with tandem scroll compressors, it is critical that the suction superheat setpoint on the expansion valve is set with one compressor running. The suction superheat should be 8-10°F with one compressor running. The suction superheat will increase with both compressors in a tandem running. Inadequate suction superheat can allow liquid refrigerant to return to the compressors which will wash the oil out of the compressor. Lack of oil lubrication will destroy a compressor. Liquid sub-cooling should be measured with both compressors in a refrigeration system running.

Compare calculated superheat to the acceptable cooling mode superheat values of 10-15°F for all system types and subcooling to range of 9-12°F.

<table>
<thead>
<tr>
<th>Air-Cooled Condenser</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sub-Cooling</strong></td>
</tr>
<tr>
<td><strong>Superheat</strong></td>
</tr>
</tbody>
</table>

**CAUTION**

**Expansion Valve Adjustment**

Expansion valves must be adjusted to approximately 10-15°F of suction superheat. Failure to have sufficient superheat will damage the compressor and void the warranty.
Adjusting Sub-cooling and Superheat Temperatures

The system is overcharged if the sub-cooling temperature is too high and the evaporator is fully loaded (low loads on the evaporator result in increased sub-cooling) and the evaporator superheat is within the temperature range shown in Table 4 - Acceptable Refrigeration Circuit Values (high superheat results in increased sub-cooling).

Correct an overcharged system by reducing the amount of refrigerant in the system to lower the sub-cooling.

CAUTION

DO NOT OVERCHARGE

Refrigerant overcharging leads to excess refrigerant in the condenser coils resulting in elevated compressor discharge pressure

The system is undercharged if the superheat is too high and the sub-cooling is too low.

Correct an undercharged system by adding refrigerant to the system to reduce superheat and raise sub-cooling.

If the sub-cooling is correct and the superheat is too high, the expansion valve may need adjustment to correct the superheat.
<table>
<thead>
<tr>
<th>°F</th>
<th>PSIG</th>
<th>°F</th>
<th>PSIG</th>
<th>°F</th>
<th>PSIG</th>
<th>°F</th>
<th>PSIG</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>78.3</td>
<td>47</td>
<td>134.7</td>
<td>74</td>
<td>213.7</td>
<td>101</td>
<td>321.0</td>
</tr>
<tr>
<td>21</td>
<td>80.0</td>
<td>48</td>
<td>137.2</td>
<td>75</td>
<td>217.1</td>
<td>102</td>
<td>325.6</td>
</tr>
<tr>
<td>22</td>
<td>81.8</td>
<td>49</td>
<td>139.7</td>
<td>76</td>
<td>220.6</td>
<td>103</td>
<td>330.2</td>
</tr>
<tr>
<td>23</td>
<td>83.6</td>
<td>50</td>
<td>142.2</td>
<td>77</td>
<td>224.1</td>
<td>104</td>
<td>334.9</td>
</tr>
<tr>
<td>24</td>
<td>85.4</td>
<td>51</td>
<td>144.8</td>
<td>78</td>
<td>227.7</td>
<td>105</td>
<td>339.6</td>
</tr>
<tr>
<td>25</td>
<td>87.2</td>
<td>52</td>
<td>147.4</td>
<td>79</td>
<td>231.3</td>
<td>106</td>
<td>344.4</td>
</tr>
<tr>
<td>26</td>
<td>89.1</td>
<td>53</td>
<td>150.1</td>
<td>80</td>
<td>234.9</td>
<td>107</td>
<td>349.3</td>
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Lubrication
All original motors and bearings are furnished with an original factory charge of lubrication.

Service
If the unit will not operate correctly and a service company is required, only a trained service technician qualified and experienced in both refrigerant chillers and air conditioning is permitted to service the system to keep warranties in effect. If assistance is required, the service technician must contact Jetson.

Note: Service technician will need the model and serial number of the unit in all correspondence with Jetson factory.

Warranties
Please refer to the limitation of warranties in effect at the time of purchase.

Pump Operation
Before initial start of the pump, check as follows:

1. Be sure that pump operates in the direction indicated by the arrow on the pump casing. Check rotation each time motor leads have been disconnected.
2. Check all connections of motor and starting device with wiring diagram. Check voltage, phase and frequency of line circuit with motor name plate.
3. Check suction and discharge piping and pressure gauges for proper operation.
4. Turn rotating element by hand to assure that it rotates freely.

Running:
Periodically inspect pump while running, but especially after initial start-up and after repairs.

1. Check pump and piping for leaks. Repair immediately.
2. Record pressure gauge readings for future reference.
3. Record voltage, amperage per phase, and kW.

Maintenance Recommendations

Pump/Fan Motor Maintenance
Cleaning - Remove oil, dust, water, and chemicals from exterior of motor and pump. Keep motor air inlet and outlet open. Blow out interior of open motors with clean compressed air at low pressure.

Labeled Motors
It is imperative for repair of a motor with Underwriters’ Laboratories label that original clearances be held; that all plugs, screws, other hardware be fastened securely, and that parts replacements be exact duplicates or approved equals. Violation of any of the above invalidates Underwriters’ Label.

Pump Bearings - Lubrication
Every 6 months or after a prolonged shut down, use waterproof, lithium-based grease. Below 32°F, use Esso Exxon or Beacon 325. Above 32°F, use Mobil Mobilox EP2, Shell Alvania EP2 or Texaco RB2.

Air Inlet
Inspect the air inlet into the condenser section on a monthly basis to remove any paper, leaves or other debris that may block the airflow.
**Propeller Fans and Motors**
The fans are directly mounted on the motor shafts and the assemblies require minimal maintenance except to assure they are clear of dirt or debris that would impede the airflow.

**Recommended Annual Inspection**
In addition to the above maintenance activities, a general inspection of the unit surface should be completed at least once a year.

**Air-Cooled Condenser**
The air-cooled condenser section rejects heat by passing outdoor air over the microchannel coils for cooling of the hot refrigerant gas from the compressors. The heated air will discharge from the top of the section through the axial flow fans.

The condenser coils should be inspected yearly to ensure unrestricted airflow. If the installation has a large amount of airborne dust or other material, the condenser coils should be cleaned with a water spray in a direction opposite to airflow. Care must be taken to prevent damage to the microchannel coil.

**Microchannel Coil Cleaning**
Documented routine cleaning of microchannel coils with factory provided E-coating is required to maintain coating warranty coverage. See E-Coated Coil Cleaning section.

Air-cooled heat exchangers include microchannel coils.

Cleaning microchannel coils is necessary in all locations. In some locations it may be necessary to clean the coils more or less often than recommended. In general, a condenser coil should be cleaned at a minimum of once a year. In locations where there is commonly debris or a condition that causes dirt/grease build up it may be necessary to clean the coils more often. Proper procedure should be followed at every cleaning interval. Using improper cleaning technique or incorrect chemicals will result in coil damage, system performance degradation, and potentially leaks requiring coil replacement.

Documented routine cleaning of microchannel coils with factory provided E-coating is required to maintain coating warranty coverage. Use the E-Coated Coil Cleaning section for details on cleaning E-coated coils.

Field applied coil coatings are not recommended with microchannel coils.

**Allowed Chemical Cleaners and Procedures** Jetson recommends certain chemicals that can be used to remove buildup of grime and debris on the surface of microchannel coils. These are the only chemicals that Jetson will warrant as correct for cleaning microchannel coils.

There are three procedures that are outlined following that will clean the coils effectively without damage to the coils. Use of any other procedure or chemical may void the warranty to the unit where the coil is installed. **With all procedures make sure the unit is off before beginning procedure.**


**WARNING**

Electric shock hazard. Shut off all electrical power to the unit to avoid shock hazard or injury from rotating parts.

The water pressure used to clean should not exceed 100 psi, from no closer than 6 inches from the coils, and with the water aimed perpendicular to the coils.

**#1 Simple Green**

Simple Green is biodegradable with a neutral 6.5 pH. Recommendation is to use it at a 4 to 1 mix. Use the following procedure.

1. Rinse the coil completely with water. Use a hard spray but be careful not to bend or damage the fins. A spray that is too hard will bend the fins. Spray from the fan side of the coil.
2. With a pump sprayer filled with a mix of 4 parts water to one-part Simple Green spray the air inlet face of the coil. Be sure to cover all areas of the face of the coil.
3. Allow the coil to soak for 10-15 minutes.
4. Rinse the coil with water as in step one.
5. Repeat as necessary.

**#2 Vinegar**

This is standard white vinegar available in gallons from most grocery stores. It has a pH of 2-3, so it is slightly acidic. Use the following procedure.

1. Rinse the coil completely with water. Use a hard spray but be careful not to bend or damage the fins. A spray that is too hard will bend the fins. Spray from the fan side of the coil.
2. Use a pump sprayer filled with vinegar (100%). Spray from the face of the coil in the same direction as the airflow. Be sure to cover all areas of the face of the coil.
3. Allow the coil to soak for 10-15 minutes.
4. Rinse the coil with water as in step one.
5. Repeat as necessary.

**#3 Water Flush**

This procedure can be used when the only material to cause the coil to need cleaning is debris from plant material that has impinged the coil face.

1. Rinse the coil completely with water. Use a hard spray but be careful not to bend or damage the fins. A spray that is too hard will bend the fins. Spray from the fan side of the coil.
2. Spray and rinse the coil from the face.

**CAUTION**

**PRESSURE CLEANING**

Use pressurized clean water, with pressure not to exceed 100 psi. Nozzle should be 6” and 80° to 90° from coil face. Failure to do so could result in coil damage.
Microchannel Coil Cleaning Considerations
The three procedures can be used to clean microchannel coils. The proper application will depend on the equipment’s installation environment.

In areas where the spring/summer has a heavy bloom (i.e. cottonwood), method #3 may be the preferred cleaning method if the unit is installed on an office building and no other environmental factors apply.

If the unit is installed where a sprinkler system sprays onto the condenser, coil cleaning method #2 may provide best results. Vinegar is slightly acidic and may help with calcium build up. This also works well when grease is part of the inlet air to a condenser coil.

Generally, the broadest based method is #1. The grease cutting effect of the Simple Green is good for restaurant applications.

Other Coil Cleaners
There are many cleaners on the market for condenser coils. Before using any cleaner that is not covered in this section you must get written approval from the Jetson warranty and service department. Use of unapproved chemicals will void the warranty.

Unless a chemical has a neutral pH (6-8) it should not be used.

Beware of any product that claims to be a foaming cleaner. The foam that is generated is caused by a chemical reaction to the aluminum fin, tube, and coating material on microchannel coils.

Microchannel coils are robust in many ways, but like any component they must be treated correctly. This includes cleaning the coils correctly to give optimal performance over many years.

E-Coated Coil Cleaning
Documented quarterly cleaning of e-coated coils is required to maintain coating warranty coverage.

**WARNING**

Electric shock hazard. Shut off all electrical power to the unit to avoid shock hazard or injury from rotating parts.

Surface loaded fibers or dirt should be removed prior to water rinse to prevent restriction of airflow. If unable to back wash the side of the coil opposite of the coils entering air side, then surface loaded fibers or dirt should be removed with a vacuum cleaner. If a vacuum cleaner is not available, a soft non-metallic bristle brush may be used. In either case, the tool should be applied in the direction of the fins. Coil surfaces can be easily damaged (fin edges bent over) if the tool is applied across the fins.

Use of a water stream, such as a garden hose, against a surface loaded coil will drive the fibers, dirt and salts into the coil. This will make cleaning efforts more difficult. Surface loaded fibers must be completely removed prior to using low velocity clean water rinse.
Quarterly cleaning is required to maintain warranty coverage and is essential to maintain the life of an E-coated coil. Coil cleaning shall be part of the unit's regularly scheduled maintenance procedures.

Failure to clean an E-coated coil on the prescribed quarterly cycle will void the warranty and may result in reduced efficiency and durability in the environment.

A routine two-step quarterly coil cleaning is required to maintain warranty.

**Step one** is to clean the coil with an approved coil cleaner listed in Microchannel Coil Cleaning.

**Step two** is to use the approved salt/chloride remover in the following section to dissolve soluble salts and revitalize the unit. It is very important when cleaning and/or rinsing not to exceed 130°F and potable water pressure is less than 100 psig to avoid damaging the unit and coil fin edges.

---

**CAUTION**

**PRESSURE CLEANING**

High velocity water from a pressure washer or compressed air should only be used at a very low pressure to prevent fin and/or coil damages. The force of the water or air jet may bend the fin edges and increase airside pressure drop. Reduced unit performance or nuisance unit shutdowns may occur.

---

**CAUTION**

**CHEMICAL CLEANING**

Harsh chemicals, household bleach, or acid cleaners should not be used to clean e-coated coils. These cleaners can be very difficult to rinse out of the coil and can accelerate corrosion and attack the e-coating. If there is dirt below the surface of the coil, use the recommended coil cleaners.

For routine quarterly cleaning, first clean the coil with the approved coil cleaner. After cleaning the coils with the approved cleaning agent, use the approved chloride remover to remove soluble salts and revitalize the unit.

**Recommended Coil Cleaner – Step 1**

**GulfCoat™ Coil Cleaner**, when used in accordance with the manufacturer's directions on the container for proper mixing and cleaning, this cleaner has been approved for use on E-coated coils to remove mold, mildew, dust, soot, greasy residue, lint and other particulate. Never use any cleaners that are not approved.

**Recommended Chloride Remover – Step 2**

**CHLOR*RID® Concentrate**, when used in accordance with the manufacturer's directions on the container for proper mixing, has been approved for use on E-coated coils to remove chlorides/salts & sulfates. Never use any chloride removers that are not approved.

**Warranty Protection – Step 1** Complete the coil cleaning following these steps:
1. Ensure that the power to the unit is off and locked out.
2. Clean the area around the unit if needed to ensure leaves, grass or loose debris will not be blown into the coil.
3. Remove panels or tops as required gaining access to the coil(s) to be cleaned.
4. Using a pump-up sprayer, fill to the appropriate level with potable water and add the correct amount of approved cleaner as per manufacture instructions leaving room for the pump plunger to be reinserted.

**NOTE:** Coils should always be cleaned / back flushed, opposite of airflow to prevent impacting the dirt into the coil.

5. If the coils have heavy dirt, fibers, grass, leaves etc. on the interior or exterior face areas, a vacuum and brush should be used to remove those surface contaminants prior to applying cleaner. The interior floor, drain tray or pan areas should also be vacuumed.

6. Apply the mixed cleaner to coil surfaces using a pressurized pump up sprayer maintaining a good rate of pressure and at a medium size nozzle spray, (not a solid stream and not a wide fan but somewhere in the middle). Work in sections/panels ensuring that all areas are covered and kept wetted.

7. Apply the cleaner to unit interior air exiting side coil surfaces first. Work in sections/panels moving side to side and from top to bottom.

8. Generously soak coils by spraying cleaner directly on and into the fin pack section to be cleaned and allow the cleaning solution to soak for 5 to 10 minutes.

9. Using pressurized potable water, (<100 psi), rinse the coils and continue to always work in sections/panels. Start at the top of the coil and slowly move vertically downward to the bottom. Then, staying in the same vertical area, slowly move back up to the top where you started. Now move over slightly overlapping the area just completed and repeat above. Continue until all coil areas on the inside of the unit have been rinsed.

10. Complete steps 5-9 for the exterior air entering side of the coils.

11. Final rinse – Now complete a quick rinse of both sides of the coil including the headers and piping.

12. If the coil has a drain pan or unit floor that is holding rinse water or cleaner, extra time and attention will need to be taken in those areas to ensure a proper rinse has been completed.

**Warranty Protection – Step 2** Complete the coil chloride (salt) removal following these steps:

1. CHLOR*RID® is a concentrate to be used for both normal inland applications at a 100:1 mix ratio OR for severe coastal applications 50:1 mix ratio with potable water, (2.56 ounces of Chlor*rid to 1 gal of water). Using a pump-up sprayer, fill to the appropriate level with potable water and add the correct amount of
1. CHLOR*RID® salt remover leaving room for the pump plunger to be reinserted.

2. Apply CHLOR*RID® to all external coil surfaces using a pressurized pump up sprayer maintaining a good rate of pressure and at a medium size nozzle spray, (not a solid stream and not a wide fan but somewhere in the middle). Work in sections/panels ensuring that all areas are covered and kept wetted.

3. Generously soak coils by spraying CHLOR*RID® directly on and into the fin pack section. Let stand for 5 to 10 minutes keeping the area wetted. Do not allow to dry before rinsing.

4. Using pressurized potable water, (<100 psi), rinse the CHLOR*RID® and dissolved chlorides/salts off of the coils continuing to always work in sections/panels.

5. Starting at the top of the coil, begin rinsing the coil from side to side until you reach the bottom. Repeat as many times as is necessary to ensure all coil sections/panels have been completed and are thoroughly rinsed.

6. Reinstall all panels and tops that were removed.
## ACCA Chillers Startup Form

Job Name: ____________________________ Date: ____________

Address: __________________________________________________________________________

Model Number: ________________________________ Serial Number: ____________ Tag: ________

Startup Contractor: _____________________________________________________________

Address: __________________________________________________________________________ Phone: ____________

### Pre-Startup Checklist

Installing contractor should verify the following items:

1. Is there any visible shipping damage? ☐ Yes ☐ No
2. Is the unit level? ☐ Yes ☐ No
3. Are the unit clearances adequate for service and operation? ☐ Yes ☐ No
4. Do all access doors open freely and are the handles operational? ☐ Yes ☐ No
5. Have all shipping braces been removed? ☐ Yes ☐ No
6. Have all electrical connections been tested for tightness? ☐ Yes ☐ No
7. Does the electrical service correspond to the unit nameplate? ☐ Yes ☐ No
8. On 208/230V units, has transformer tap been checked? ☐ Yes ☐ No
9. Has overcurrent protection been installed to match the unit nameplate requirement? ☐ Yes ☐ No
10. Have all set screws on the fans been tightened? ☐ Yes ☐ No
11. Do all fans rotate freely? ☐ Yes ☐ No
12. Does the field water piping to the unit appear to be correct per design parameters? ☐ Yes ☐ No

### Ambient Temperature

Ambient Dry Bulb Temperature ________ °F  Ambient Wet Bulb Temperature ________ °F

### Chiller Operation

Chilled Water In Temperature ________ °F  Chilled Water Out Temperature ________ °F
Water/Glycol System
1. Has the entire system been flushed and pressure checked? □ Yes □ No
2. Have isolation valves to the chiller been installed? □ Yes □ No
3. Has the entire system been filled with fluid? □ Yes □ No
4. Has air been bled from the heat exchangers and piping? □ Yes □ No
5. Is there a minimum load of 25% of the design load? □ Yes □ No
6. Has the water piping been insulated? □ Yes □ No
7. Is the glycol the proper type and concentration (N/A if water)? □ Yes □ No
8. What is the freeze point of the glycol (N/A if water)?

Compressors/DX Cooling

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☐ Alignment  ☐ Check Rotation  Nameplate Amps _______

## Pumping Package

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**Maintenance Log**

This log must be kept with the unit. It is the responsibility of the owner and/or maintenance/service contractor to document any service, repair or adjustments. Jetson Service and Warranty Department is available to advise and provide phone support for proper operation and replacement parts. The responsibility for proper start-up, maintenance and servicing of the equipment falls to the owner and qualified licensed technician.

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Literature Change History

July 2020
Initial version of document.
ACCA chillers
Installation, Operation, & Maintenance

Factory Technical Support:  903-758-2900

Note: Before calling Technical Support, please have the model and serial number of the unit available.

Parts: For replacement parts, please contact your local Jetson Representative.

It is the intent of Jetson to provide accurate and current product information. However, in the interest of product improvement, Jetson reserves the right to change pricing, specifications, and/or design of its product without notice, obligation, or liability.

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