| Installation and Maintenance Manual | IMM ACZ/AGZ-4 |
|---|---|
| | Group: **Chiller** |
| | Part Number: **331374201** |
| | Effective: **October 2006** |
| | Supersedes: **August 2006** |

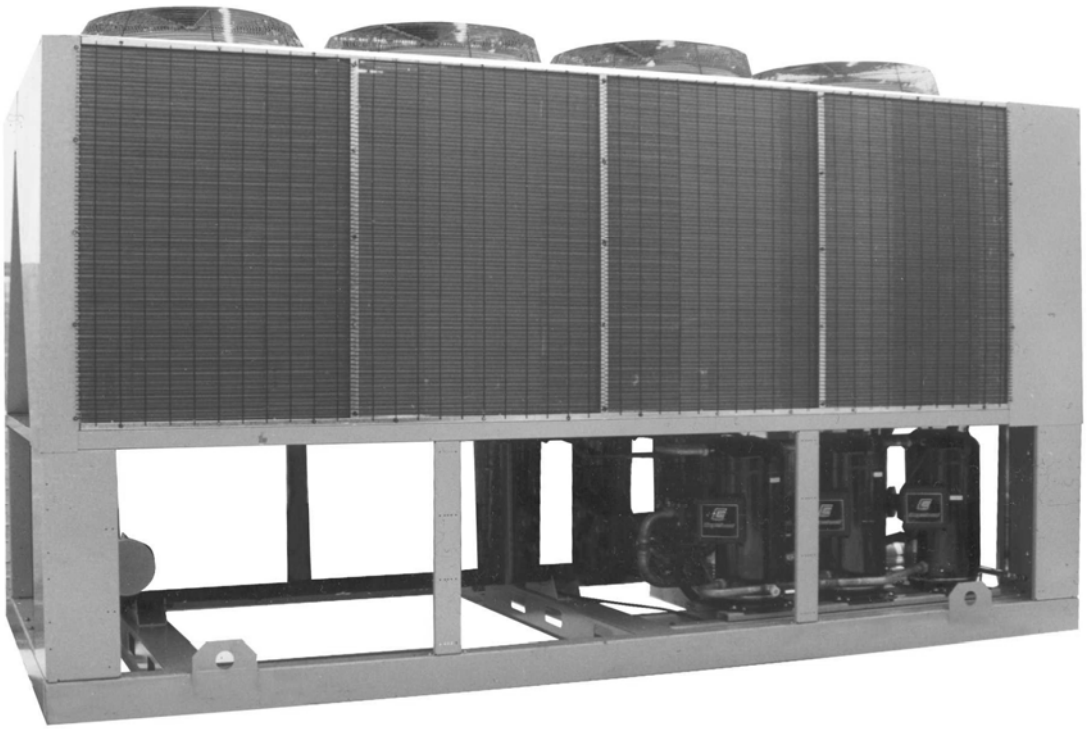
# Air-Cooled Scroll Condensing Units

**ACZ 030B through 155B**

# Air-Cooled Scroll Chillers w/ Remote Evaporators

**AGZ 026BM through 130BM**

**60 Hertz, R-22, R 407C**



McQuay Air Conditioning

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BMA BACnet MANUFACTURERS ASSOCIATION MEMBER

LONMARK 3.3

Unit controllers are LONMARK certified with an optional LONWORKS communication

Manufactured in an **ISO Certified** facility

# Introduction

## General Description

This manual covers two similar product lines:

**AGZ-BM**, Packaged chiller with the evaporator shipped separately for remote installation, field piping to the outdoor unit, and interconnection of wiring. The refrigeration specialties are shipped from the factory for field installation.

Operating instructions are contained in operating manual OM AGZ.

**ACZ-BC,** Condensing unit with no evaporator included. For use with customer supplied low side (usually an air-handling unit), field piped and wired to the condensing unit.

Operating instructions are contained in operating manual OM ACZ.

These McQuay air-cooled units are complete, self-contained, automatic refrigerating units. Every unit is completely assembled, factory wired, tested and provided with a holding charge. Each unit consists of two air-cooled condenser sections with integral subcooler sections, two tandem or triple scroll compressors, (brazed-plate or replaceable tube, dual circuit shell-and-tube evaporator and liquid line components including manual, sight-glass/moisture indicators, solenoid valves, and thermal expansion valves on AGZ-BM only). Other features include compressor crankcase heaters, an evaporator heater for chilled water freeze protection (on AGZ-BM only), one-time pumpdown during “on” or “off” periods, and automatic compressor lead-lag to alternate the compressor starting sequence.

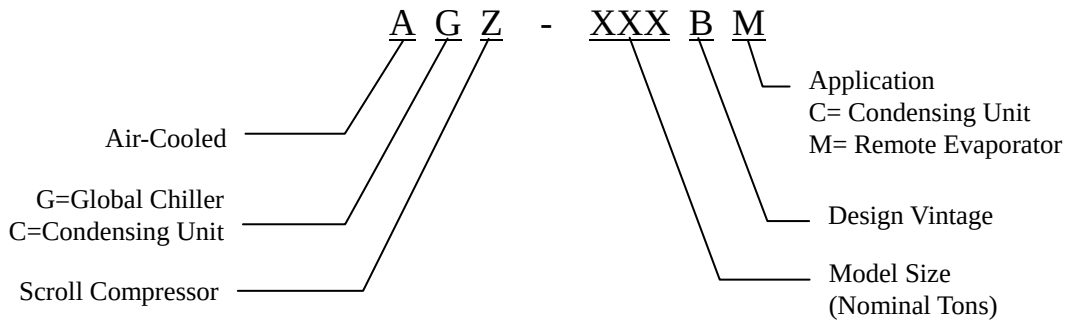
The electrical control center includes all equipment protection and operating controls necessary for dependable automatic operation. Condenser fan motors are protected in all three phases and started by their own three-pole contactors. Model ACZ condensing units require a field-supplied multi-step thermostat wired to the outdoor unit.

## Inspection

Check all items carefully against the bill of lading. Inspect all units for damage upon arrival. Report shipping damage and file a claim with the carrier. Check the unit nameplate before unloading, making certain it agrees with the power supply available. McQuay is not responsible for physical damage after unit leaves the factory.

**Note:** Unit shipping and operating weights are available in the Physical Data tables beginning on page 28.

## Nomenclature



# Installation

**Note:** Installation is to be performed by qualified personnel who are familiar with local codes and regulations.

**WARNING**

**Sharp edges on unit and coil surfaces are a potential hazard to personal safety. Avoid contact with them.**

## Handling

Be careful to avoid rough handling of the unit. Do not push or pull the unit from anything other than the base. Block the pushing vehicle away from the unit to prevent damage to the sheet metal cabinet and end frame (see Figure 1).

To lift the unit, 2 1/2" (64mm) diameter lifting tabs are provided on the base of the unit. Arrange spreader bars and cables to prevent damage to the condenser coils or cabinet (see Figure 2).

***Figure 1, Suggested Pushing Arrangement***

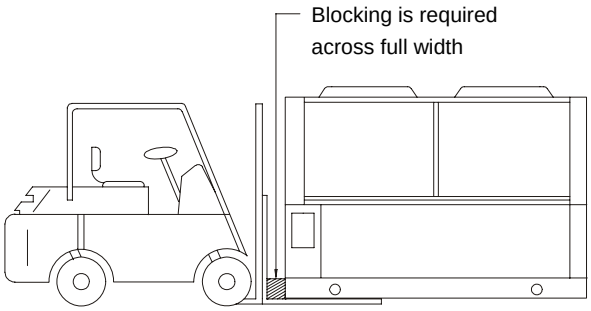
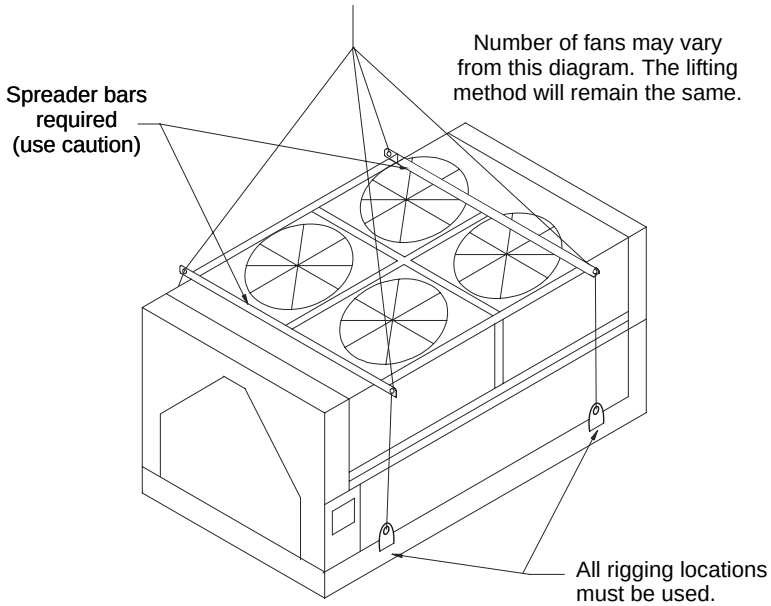



***Figure 2, Suggested Lifting Arrangement***



# Location

## Unit Placement

ACZ/AGZ units are for outdoor applications and can be mounted either on a roof or at ground level. For roof mounted applications, install the unit on a steel channel or I-beam frame to support the unit above the roof. For ground level applications, install the unit on a substantial base that will not settle. A one-piece concrete slab with footings extended below the frost line is recommended. Be sure the foundation is level within 1/2"(13mm) over its length and width. The foundation must be strong enough to support the weights listed in the Physical Data Tables beginning on page 28.

***Figure 3, Clearances***

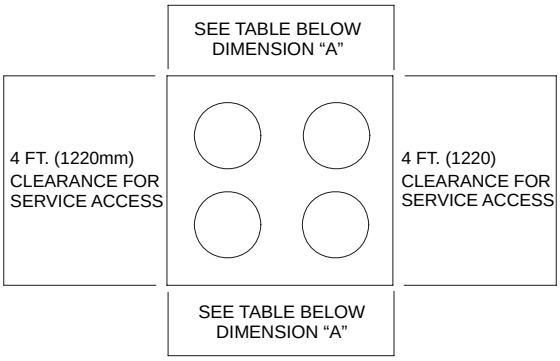



***Table 1, Recommended Minimum Clearances***

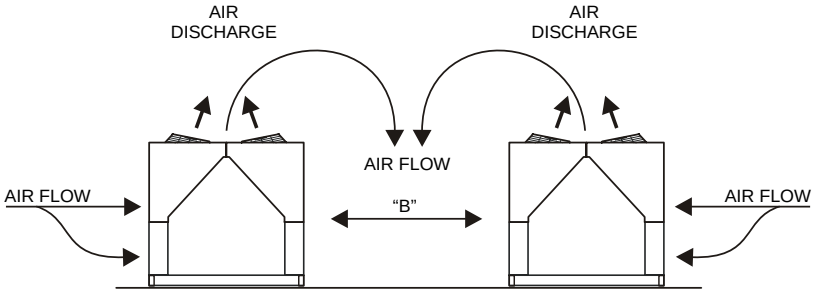
| ACZ-BC Model Sizes | AGZ-BM Model Size | Coil Side "A" ft (m) | "B" ft (m) | "C" ft (m) | End Opposite Controls ft (m) | Control Panel End ft. (m) |
|---|---|---|---|---|---|---|
| 030B – 080B | 026B – 070B | 4 (1.2) | 8 (2.4) | 6 (1.8) | 4 (1.2) | 4 (1.2) |
| 090B – 155B | 075B – 130B | 6 (1.8) | 12 (3.6) | 8 (2.4) | 4 (1.2) | 4 (1.2) |

## Clearances

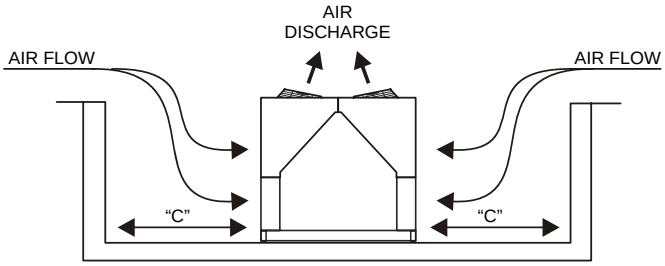
Do not block the flow of air to and from the condenser coil. Restricting airflow or allowing air recirculation will result in a decrease in unit performance and efficiency because discharge pressures are increased. There must be no obstruction above the unit that would deflect discharge air downward where it could be recirculated back to the inlet of the condenser coil. The condenser fans are propeller type and will not operate with ductwork.

Install the unit with enough side clearance for air entrance to the coil and for servicing. Provide service access to the evaporator, compressors, electrical control panel and piping components.

Do not allow debris to accumulate near the unit where it could be drawn into the condenser coil. Keep condenser coils and fan discharge free of snow or other obstructions to permit adequate airflow for proper operation.




The recommended minimum side clearance between two units is dimension "B' in table on this page.




The unit must not be installed in a pit or enclosure that is deeper or taller than the height of the unit unless extra space is provided. The minimum clearance on each side of the unit is dimension "C" in table on this page.

## Restricted Air Flow

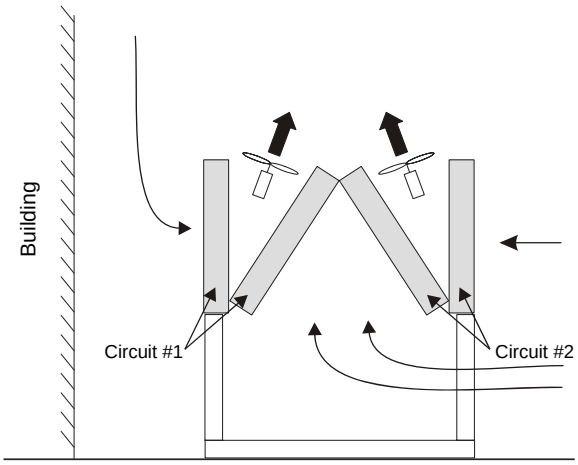
### General

The clearances required for design-life operation of ACZ/AGZ air-cooled units are described in the previous section. Occasionally, these clearances cannot be maintained due to site restrictions, such as units being too close together, or a fence or wall restricting airflow, or both.

The McQuay ACZ/AGZ units have several features that can mitigate the problems attributable to restricted airflow.

- The condenser section is configured as shown below. This configuration allows inlet air for these coils to come in from either side. A vertical coil and its adjacent angled coil are manifolded together to serve one refrigerant circuit.
- The MicroTech II™ control is proactive in response to "off-design conditions". In the case of single or compounded influences restricting airflow to the unit, the microprocessor will act to keep the compressor(s) running (possibly at reduced capacity) rather than allowing a shut-off on high discharge pressure.
- The MicroTech II™ control can be programmed to sequence the compressors in the most advantageous way. For example, in the diagram shown below, it might be desirable to program circuit #1 to be the lag circuit (last circuit to reach full load) during periods of high ambient temperatures.

***Figure 4, Coil and Fan Arrangement***




NOTE: Models ACZ 030 to 045 and AGZ 026 to 035 do not have an interior slanted coil.

The following sections discuss the most common situations of condenser air restriction and give capacity and power adjustment factors for each. Note that in unusually severe conditions, the MicroTech II™ controller would adjust the unit operation to remain online until a less severe condition is reached.

## Case 1, Building or Wall on One Side of One Unit

The existence of a screening wall, or the wall of a building, in close proximity to an air-cooled unit is common in both rooftop and ground level applications. Hot air recirculation on the coils adjoining the wall will increase compressor discharge pressure, decreasing capacity and increasing power consumption. Only the compressor(s) connected to these coils will be affected.

When close to a wall, place chillers on the north or east-side of them. Have prevailing winds blowing parallel to the unit's long axis. The worst case is to have wind blowing hot discharge air into the wall.

***Figure 5, Unit Adjacent to Wall***

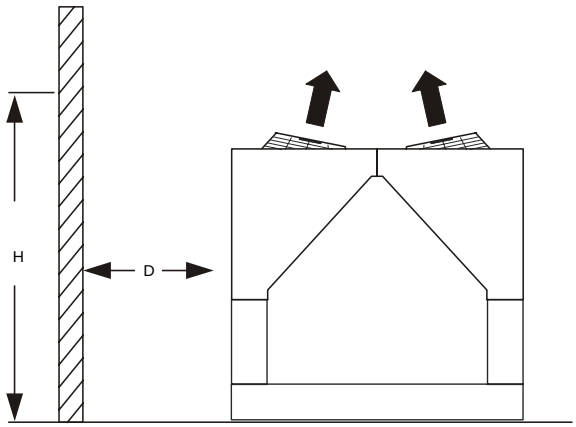
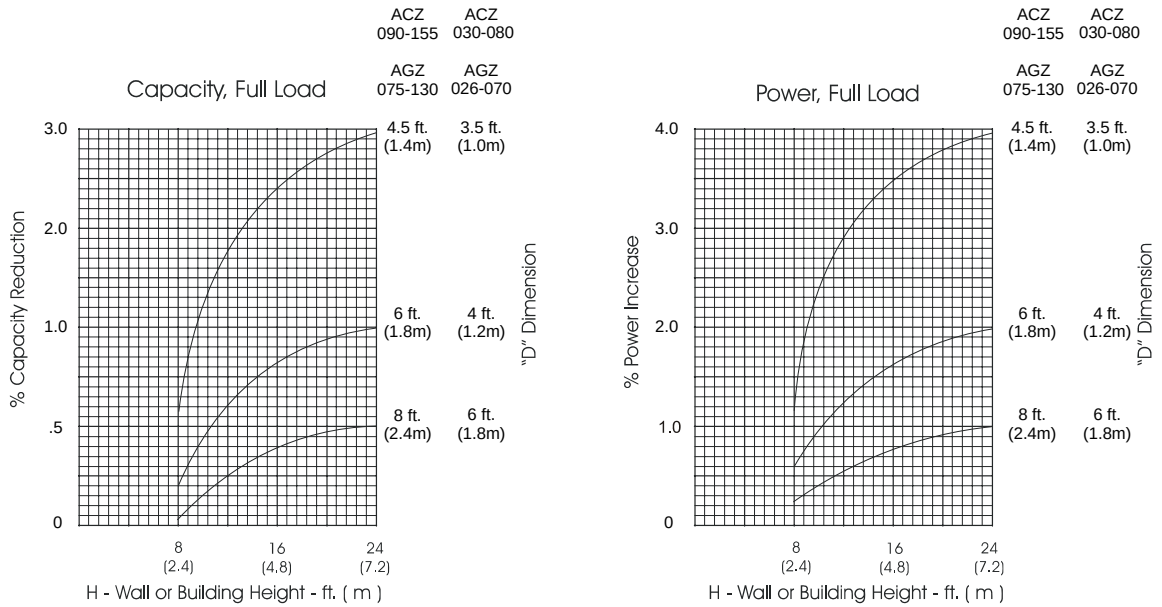



***Figure 6, Adjustment Factors***



## Case 2, Two Units Side By Side

Two or more units sited side by side are common. If spaced closer than 12 feet (3.7 meters), or 8 feet (2.5meters), depending on size, it is necessary to adjust the performance of each unit. Circuits adjoining each other are affected. **NOTE:** This case applies only to *two* units side by side. See Case 3 for three or more parallel units. If one of the two units also has a wall adjoining it, see Case 1. Add the two adjustment factors together and apply to the unit located between the wall and the other unit.

Mounting units end to end will not necessitate adjusting performance. Depending on the actual arrangement, sufficient space must be left between the units for access to the control panel door opening and/or evaporator tube removal. See "Clearance" section of this guide for requirements for specific units.

***Figure 7, Two Units Side by Side***

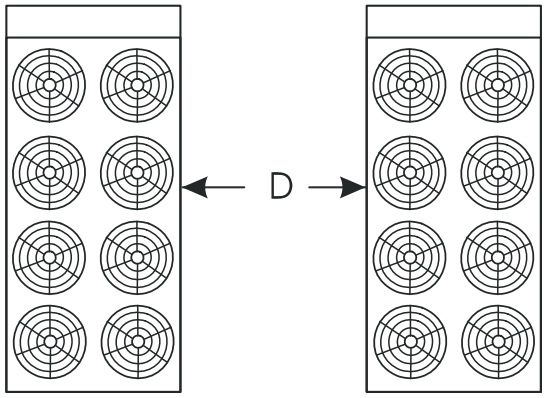
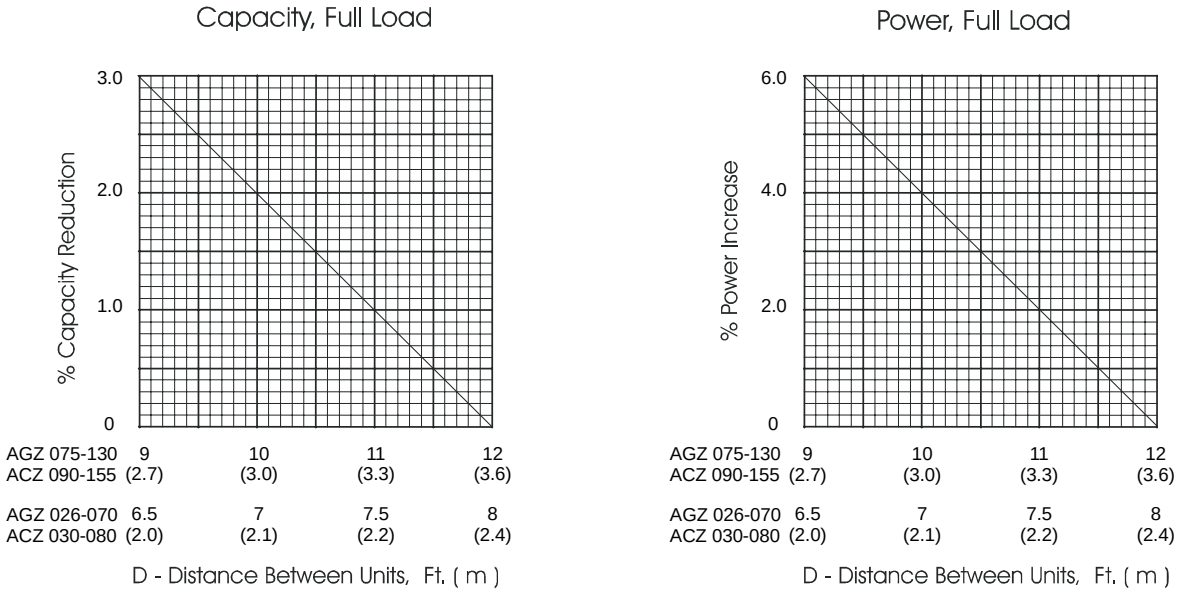



***Figure 8, Adjustment Factor***



## Case 3, Three or More Units Side By Side

When three or more units are side by side, the outside units (1 and 3 in this case) are influenced by the middle unit only on their inside circuits. Their adjustment factors will be the same as Case 2. All inside units (only number 2 in this case) are influenced on both sides and must be adjusted by the factors shown below.

***Figure 9, Three or More Units***

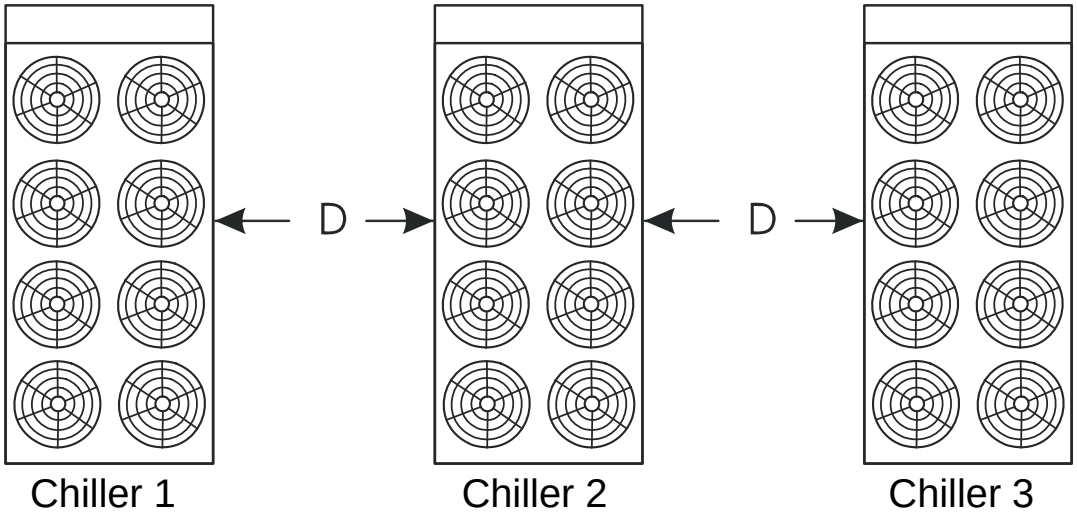
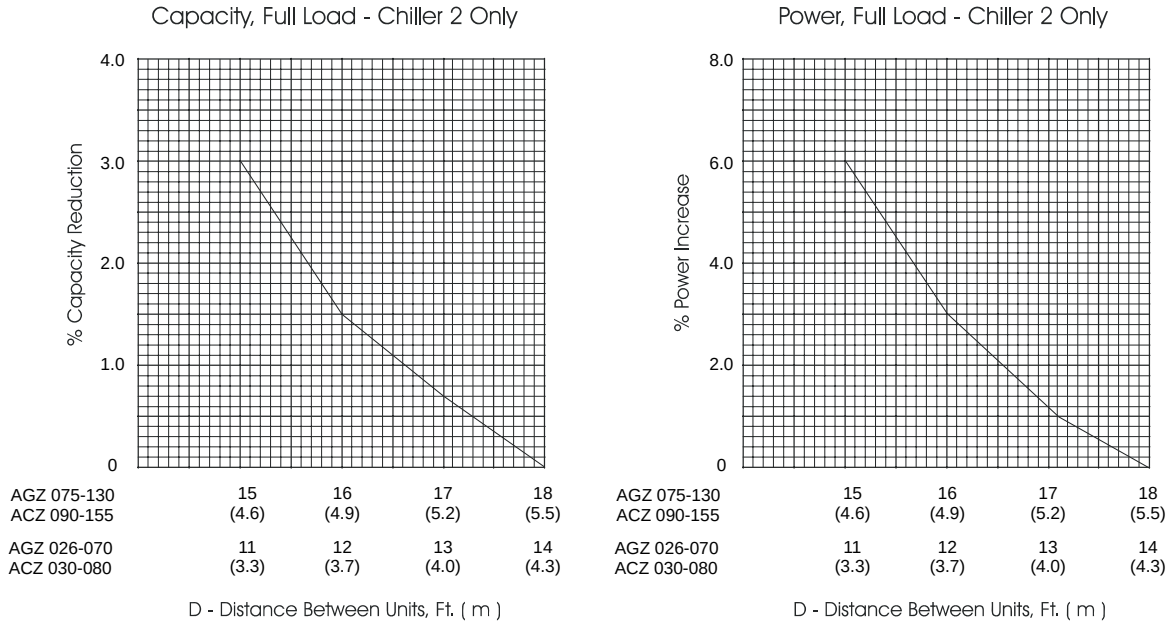



***Figure 10, Adjustment Factor***



## Case 4, Open Screening Walls

Decorative screening walls are often used to help conceal a unit either on grade or on a rooftop. These walls should be designed such that the combination of their open area and distance from the unit do not require performance adjustment. It is assumed that the wall height is equal to or less than the unit height when mounted on its base support. This is usually satisfactory for concealment. If the wall height is greater than the unit height, see Case 5, Pit Installation.

The distance from the ends of the unit to the end walls must be sufficient for service, opening control panel doors, and pulling evaporator tubes, as applicable.

If each side wall is a different distance from the unit, the distances can be averaged, providing either wall is not less than 8 feet (2.4 meters) from the unit. For example, do not average 4 feet and 20 feet to equal 12 feet.

***Figure 11, Open Screening Walls***

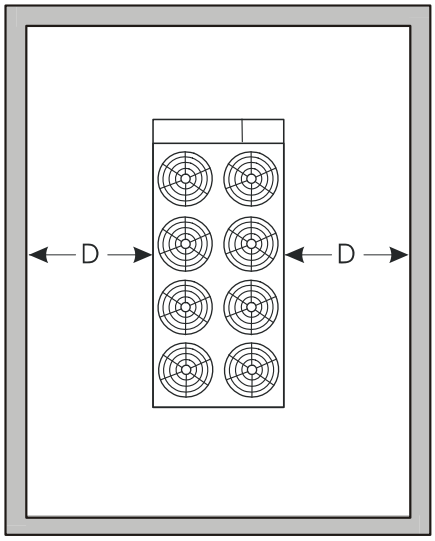
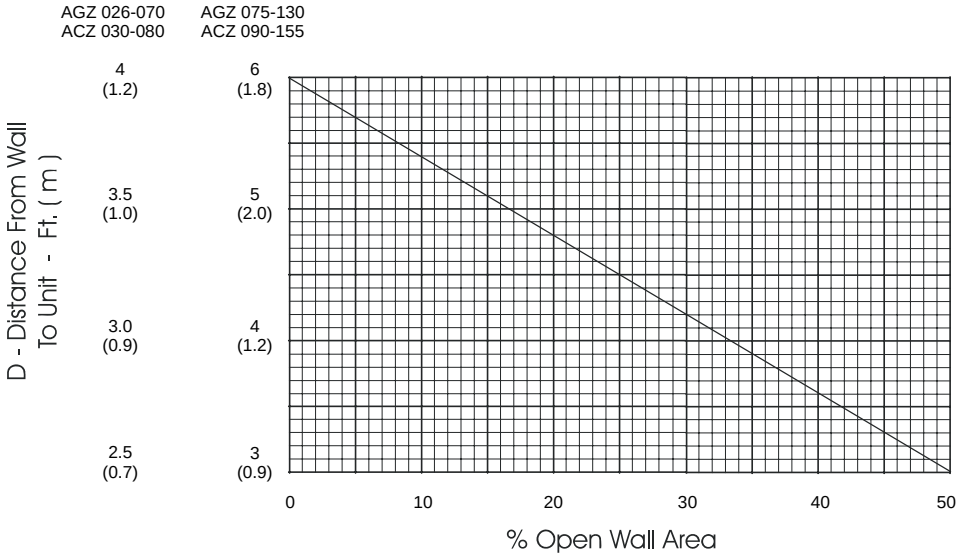



***Figure 12, Wall Free Area vs. Distance***

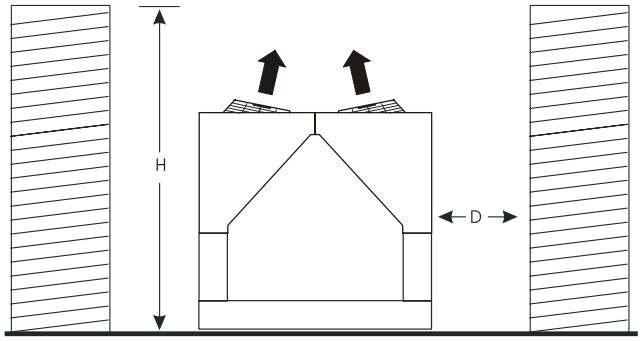


## Case 5, Pit/Solid Wall Installation

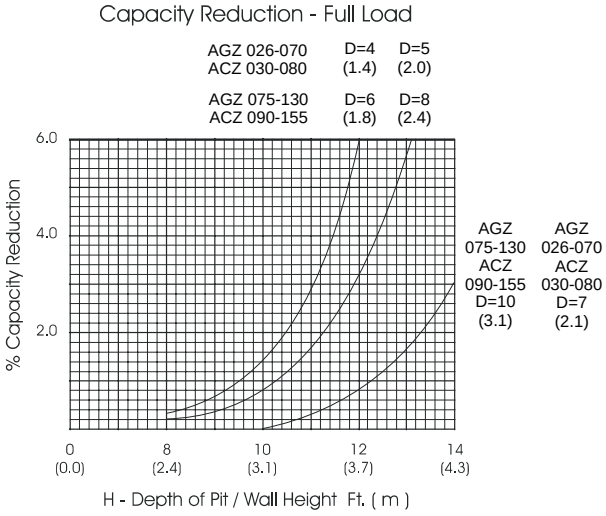
Pit installations can cause operating problems and great care should be exercised if they are to be used on an installation. Recirculation and restriction can both occur. A solid wall surrounding a unit is substantially the same as a pit and the data presented here should be used.

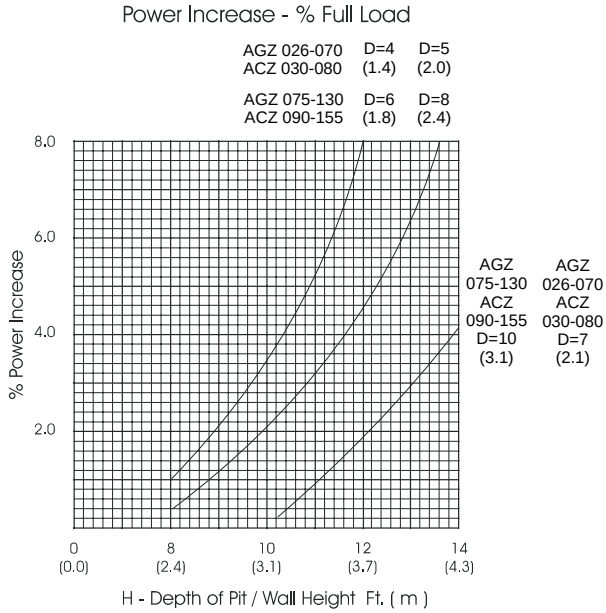
Steel grating is sometimes used to cover a pit to prevent accidental falls or trips into the pit. The grating material and installation design must be strong enough to prevent such accidents, yet provide abundant open area or serious recirculation problems will occur. Have any pit installation reviewed by McQuay application engineers prior to installation for air-flow characteristics. The installation design engineer must approve the work to avoid an unreasonable risk of accident and is responsible for final design criteria.

### *Figure 13, Pit Installation*




### *Figure 14, Adjustment Factor*



# Sound Isolation

The low sound level of the ACZ/AGZ units is suitable for most applications. When additional sound reduction is necessary, locate the unit away from sound sensitive areas. Avoid locations beneath windows, or between structures where normal operating sounds can be objectionable. Reduce structurally transmitted sound by isolating refrigerant lines, electrical conduit and the unit itself. Use wall sleeves and rubber isolated piping hangers to reduce transmission of water, refrigerant, or pump noise into occupied spaces. Use flexible electrical conduit to isolate sound transmission through electrical conduit. Spring isolators are effective in reducing the low amplitude sound generated by scroll compressors and for unit isolation in sound sensitive areas.

# Vibration Isolators

Vibration isolator springs are recommended for all roof-mounted installations, or wherever vibration transmission is a consideration. Some form of isolator is also recommended for slab installations, primarily to keep the unit base from resting its entire length directly on the slab.

Table 2 and Table 3 list isolator point loads for all unit sizes. Figure 15 and 16 shows isolator locations. See Dimensional Data for detailed mounting hole location.

## Isolator Installation

The unit should be initially installed on shims or blocks at the listed free height. When all piping, wiring, flushing, charging, etc., is completed, adjust the springs upward to load them and to provide clearance to remove the shims or blocks.

Installation of spring isolators requires flexible piping connections and at least three feet of conduit flex tie-ins. Piping and conduit must be supported independently of the unit.

**Bolting**: if the chiller base is to be bolted to the isolators, it is recommended that the short threaded studs usually found on isolators be replaced with eight-inch threaded rod that can extend through the holes on the top of the base and then be bolted. Washers will be required.

***Figure 15, RP-4, Neoprene-in-Shear Isolators CP-2, Spring Isolators***

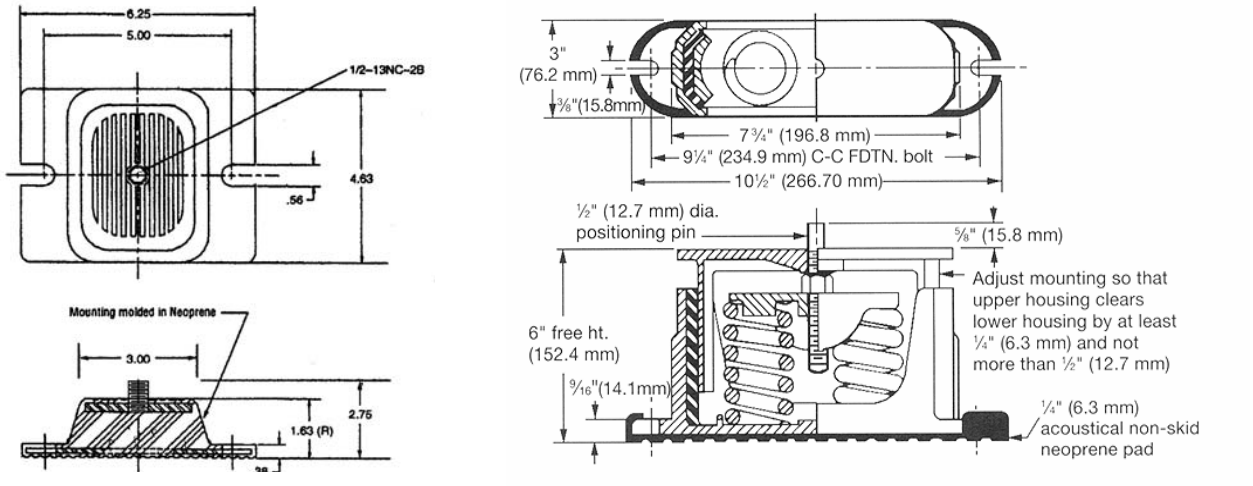
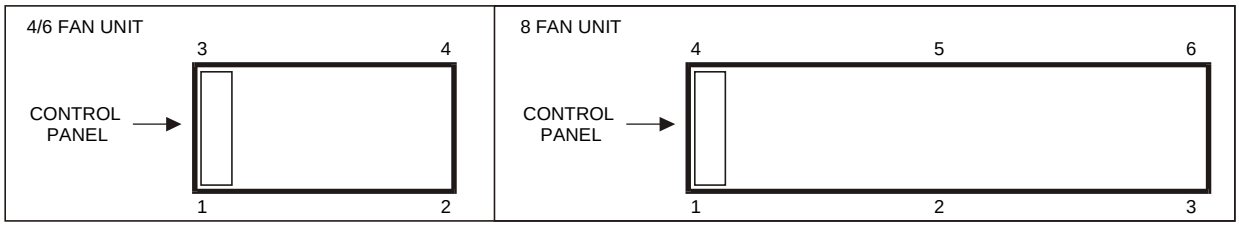



***Figure 16, Isolator Locations,***



### *Table 2, Isolator Loads At Each Mounting Location (With Aluminum Fins)*

| ACZ-B Model | AGZ-BM Model | | Shipping Wt | Operating. Wt | Loc. 1 | Loc. 2 | Loc. 3 | Loc. 4 | Total | (1) Add'l for Copper Fins |
|---|---|---|---|---|---|---|---|---|---|---|
| ACZ 030 | AGZ 026 | lbs | 3550 | 3600 | 1227 | 901 | 849 | 623 | 3600 | 72 |
| | | kg | 1608 | 1631 | 556 | 408 | 385 | 282 | 1631 | 32 |
| ACZ 035 | AGZ 030 | lbs | 3550 | 3600 | 1227 | 901 | 849 | 623 | 3600 | 72 |
| | | kg | 1608 | 1631 | 556 | 408 | 385 | 282 | 1631 | 32 |
| ACZ 040 | AGZ 035 | lbs | 3550 | 3600 | 1227 | 901 | 849 | 623 | 3600 | 72 |
| | | kg | 1608 | 1631 | 556 | 408 | 385 | 282 | 1631 | 32 |
| ACZ 045 | AGZ 040 | lbs | 3550 | 3610 | 1261 | 872 | 873 | 604 | 3610 | 72 |
| | | kg | 1608 | 1635 | 571 | 395 | 395 | 274 | 1635 | 32 |
| ACZ 050 | AGZ 045 | lbs | 3590 | 3650 | 1275 | 881 | 883 | 611 | 3650 | 72 |
| | | kg | 1626 | 1653 | 578 | 399 | 400 | 277 | 1653 | 32 |
| ACZ 055 | AGZ 050 | lbs | 3730 | 3800 | 1295 | 951 | 896 | 658 | 3800 | 119 |
| | | kg | 1690 | 1721 | 587 | 431 | 406 | 298 | 1721 | 54 |
| ACZ 060 | AGZ 055 | lbs | 3780 | 3850 | 1303 | 1016 | 860 | 671 | 3850 | 119 |
| | | kg | 1712 | 1744 | 590 | 460 | 390 | 304 | 1744 | 54 |
| ACZ 065 | AGZ 060 | lbs | 3820 | 4040 | 1367 | 1066 | 903 | 704 | 4040 | 142 |
| | | kg | 1730 | 1830 | 619 | 483 | 409 | 319 | 1830 | 65 |
| ACZ 070 | AGZ 065 | lbs | 3970 | 4070 | 1305 | 1146 | 862 | 757 | 4070 | 142 |
| | | kg | 1798 | 1844 | 591 | 519 | 390 | 343 | 1844 | 65 |
| ACZ 080 | AGZ 070 | lbs | 4080 | 4180 | 1278 | 1192 | 885 | 825 | 4180 | 217 |
| | | kg | 1848 | 1894 | 579 | 540 | 401 | 374 | 1894 | 99 |

NOTE (1): Additional weight for copper coils is per mounting location.

### *Table 3, Isolator Loads At Each Mounting Location (With Aluminum Fins)*

| ACZ Model | AGZ-BM Model | | Shipping Wt. | Operating Wt. | Loc 1 | Loc 2 | Loc 3 | Loc 4 | Loc 5 | Loc 6 | TOTAL | (1) Add'l for Copper Fins |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACZ090 | AGZ 075 | lbs | 5510 | 5630 | 1649 | 1166 | 1649 | 1166 | - | - | 5630 | 217 |
| | | kg | 2496 | 2550 | 747 | 528 | 747 | 528 | - | - | 2550 | 99 |
| ACZ100 | AGZ 085 | lbs | 5670 | 5790 | 1734 | 1227 | 1657 | 1172 | - | - | 5790 | 217 |
| | | kg | 2569 | 2623 | 786 | 556 | 751 | 531 | - | - | 2623 | 99 |
| ACZ110 | AGZ 090 | lbs | 5830 | 5950 | 1770 | 1205 | 1770 | 1205 | - | - | 5950 | 217 |
| | | kg | 2641 | 2695 | 802 | 546 | 802 | 546 | - | - | 2695 | 99 |
| ACZ120 | AGZ 100 | lbs | 6820 | 6970 | 1323 | 1188 | 1053 | 1265 | 1135 | 1006 | 6970 | 289 |
| | | kg | 3089 | 3157 | 599 | 538 | 477 | 573 | 514 | 456 | 3157 | 131 |
| ACZ130 | AGZ 110 | lbs | 7080 | 7230 | 1396 | 1205 | 1014 | 1396 | 1205 | 1014 | 7230 | 289 |
| | | kg | 3207 | 3275 | 632 | 546 | 459 | 632 | 546 | 459 | 3275 | 131 |
| ACZ140 | AGZ 120 | lbs | 7360 | 7480 | 1477 | 1275 | 1073 | 1411 | 1218 | 1026 | 7480 | 289 |
| | | kg | 3334 | 3388 | 669 | 578 | 486 | 639 | 552 | 465 | 3388 | 131 |
| ACZ155 | AGZ 130 | lbs | 7640 | 7760 | 1555 | 1293 | 1032 | 1555 | 1293 | 1032 | 7760 | 289 |
| | | kg | 3461 | 3515 | 704 | 586 | 467 | 704 | 586 | 467 | 3515 | 131 |

NOTE (1): Additional weight for copper coils is per mounting location.

### *Table 4, Isolator Kit Numbers*

| ACZ-B Model | 030 - 040 | 045 - 065 | 070 | 080 | 090 - 110 | 120, 130 | 140, 155 |
|---|---|---|---|---|---|---|---|
| AGZ-BM Model | 026 - 035 | 040 - 060 | 065 | 070 | 075 - 090 | 100, 110 | 120, 130 |
| Spring Kit Part No. | 330349601 | 330349602 | 330349603 | 330349604 | 330349608 | 330349610 | 330349611 |
| R-I-S Kit Part No. | 330349701 | 330349701 | 330349703 | 330349703 | 330349706 | 330349707 | 330349708 |

***Table 5, Isolator Locations***

| ACZ-BS, AGZ-BM Less Evaporator Units | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACZ-BS Model | AGZ-BM Model | Operating Weight | | Neoprene-In-Shear Mountings | | | | | | Spring-Flex Mountings | | | | | |
| | | lbs | kg | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 (1) | 5 | 6 |
| **030** | **026** | 3600 | 1631 | Black | Gray | Gray | Green | - | - | Orange | Purple | Red | Orange | | |
| **035** | **030** | 3600 | 1631 | Black | Gray | Gray | Green | - | - | Orange | Purple | Red | Orange | - | - |
| **040** | **035** | 3600 | 1631 | Black | Gray | Gray | Green | - | - | Orange | Purple | Red | Orange | - | - |
| **045** | **040** | 3610 | 1635 | Black | Gray | Gray | Green | - | - | Orange | Purple | Purple | Orange | - | - |
| **050** | **045** | 3650 | 1653 | Black | Gray | Gray | Green | - | - | Orange | Purple | Purple | Orange | - | - |
| **055** | **050** | 3800 | 1721 | Black | Gray | Gray | Green | - | - | Orange | Purple | Purple | Orange | - | - |
| **060** | **055** | 3850 | 1744 | Black | Gray | Gray | Green | - | - | Orange | Purple | Purple | Orange | - | - |
| **065** | **060** | 4040 | 1830 | Black | Gray | Gray | Green | - | - | Orange | Purple | Purple | Orange | - | - |
| **070** | **065** | 4070 | 1844 | Black | Black | Gray | Gray | - | - | Orange | Purple | Purple | Red | - | - |
| **080** | **070** | 4180 | 1894 | Black | Black | Gray | Gray | - | - | Orange | Orange | Purple | Red | - | - |
| **090** | **075** | 5630 | 2550 | Red | Black | Red | Black | - | - | Green | Orange | Green | Orange | - | - |
| **100** | **085** | 5790 | 2623 | Red | Black | Red | Black | - | - | Green | Orange | Green | Orange | - | - |
| **110** | **090** | 5950 | 2695 | Red | Black | Red | Black | - | - | Green | Orange | Green | Orange | - | - |
| **120** | **100** | 6970 | 3157 | Black | Black | Black | Black | Black | Black | Orange | Orange | Purple | Orange | Orange | Purple |
| **130** | **110** | 7230 | 3275 | Black | Black | Black | Black | Black | Black | Orange | Orange | Purple | Orange | Orange | Purple |
| **140** | **120** | 7480 | 3388 | Red | Black | Black | Red | Black | Black | Green | Orange | Purple | Green | Orange | Purple |
| **155** | **130** | 7760 | 3515 | Red | Black | Black | Red | Black | Black | Green | Orange | Purple | Green | Orange | Purple |

**NOTE (1):** Position #4 is a CP-1, single spring isolator for ACZ 030 to 065 and AGZ 026 to 060. All others are CP-2, two spring.

# Ambient Temperature and Water Flow Limitations

ACZ/AGZ units are designed to operate in ambient temperatures as shown in the following table.

***Table 6, Unit Maximum Operating Ambient Temperature***

| Unit Model | Standard Controls | w/ Low Ambient VFD Control Option | w/ Low Ambient VFD Control Plus High Ambient Panel Option |
|---|---|---|---|
| AGZ 026B – 130B<br>ACZ 030B – 155B | 115°F | 105°F | 125°F |

The VFD Low Ambient Control Option imposes an additional heat load on the control panel limiting operation to 105°F ambient temperature. The addition of the High Ambient Panel Option allows operation to 125°F ambient temperature.

Compressor loading and unloading is adaptively determined by system load, ambient air temperature, and other inputs to the MicroTech control algorithms. An optional low ambient fan VFD option allows operation down to 0°F (-18°C). The minimum ambient temperature is based on still conditions where the wind is not greater than five mph. Greater wind velocities will result in reduced discharge pressure, increasing the minimum operating ambient temperature. Field-installed hail/wind guards are available to allow the chiller to operate effectively down to the ambient temperature for which it was designed.

Evaporator flow rates can be found on page 25. Operation below the minimum values can result in laminar flow causing freeze-up problems, scaling and poor control. Flow rates above the maximum values will result in unacceptable pressure drops and can cause excessive erosion, potentially leading to failure.

# Water Piping (Model AGZ-BM)

Local authorities can supply the installer with the proper building and safety codes required for safe and proper installation.

Install piping with minimum bends and changes in elevation to minimize pressure drop. The following issues must be considered when designing and installing water piping:

1. Vibration eliminators to reduce vibration and noise transmission to the building.
2. Shutoff valves are required to isolate the unit from the piping system during unit servicing.
3. Manual or automatic air vent valves at the high points of the system. Drains must be installed at the lowest points in the system.
4. Adequate system water pressure must be maintained (expansion tank or regulating valve).
5. Temperature and pressure indicators located at the unit are required to aid in unit servicing.
6. A strainer or other means of removing foreign matter from the water before it enters the pump must be installed. Place the strainer far enough upstream to prevent cavitation at the pump inlet (consult pump manufacturer for recommendations). The use of a strainer will prolong pump life and keep system performance up.
7. A strainer must be installed in the water line before the inlet of the evaporator. This will help prevent foreign material from entering and decreasing the evaporator performance.
8. If the unit is used as a replacement chiller, flush the system thoroughly before unit installation. Regular water analysis and chemical water treatment for the evaporator loop is recommended immediately at equipment start-up.
9. The total water volume in the system should be sufficient to prevent frequent "on-off" cycling. Turnover rate should not be less than 4 minutes for normal variable cooling loads.
10. When glycol is added to the water system for freeze protection, the refrigerant suction pressure will be lower, cooling performance less, and water side pressure drop greater. If the percentage of glycol is high, or if propylene is used instead of ethylene glycol, the added pressure drop and loss of performance could be substantial. When Glycol or Ice are selected as Unit Mode, the MicroTech controller will automatically reset the available range for the Leaving Water Temperature, Freezestat and Evaporator Pressure settings.

    Reset the freezestat setting to approximately 4 to 5 degrees F (2.3 to 2.8 degrees C) below the leaving chilled water setpoint temperature. See the section titled "Glycol Solutions" for additional information concerning glycol.
11. Perform a preliminary leak check before insulating the piping and filling the system.
12. Piping insulation should include a vapor barrier to prevent condensation and possible damage to the building structure from water dripping.

***Figure 17, AGZ 075BM – AGZ 130BM, Typical Field Evaporator Water Piping***

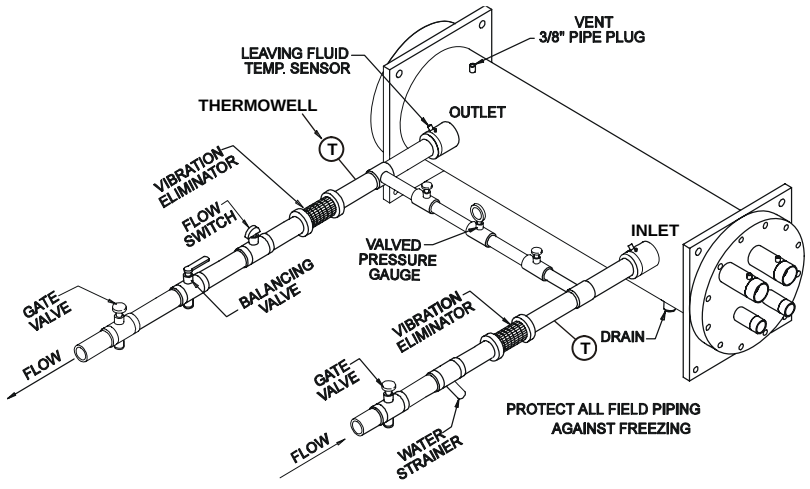
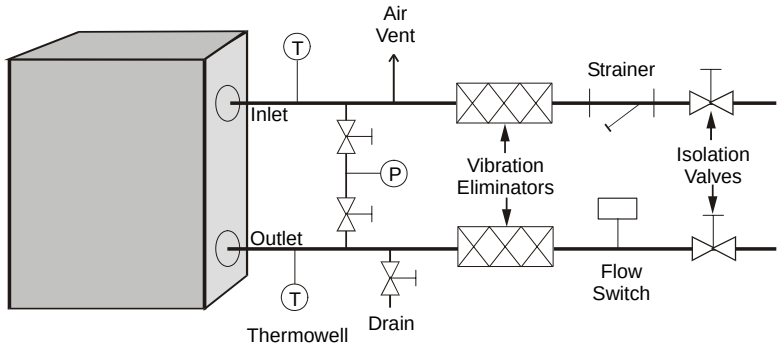


***Figure 18, AGZ 026BM - AGZ 070BM, Typical Field Evaporator Water Piping***




## Flow Switch (Model AGZ-BM)

Mount a water flow switch in the leaving water line of the remote water chiller to shut down the unit when water flow is interrupted. A flow switch is an equipment protection control and should never be used to cycle a unit.

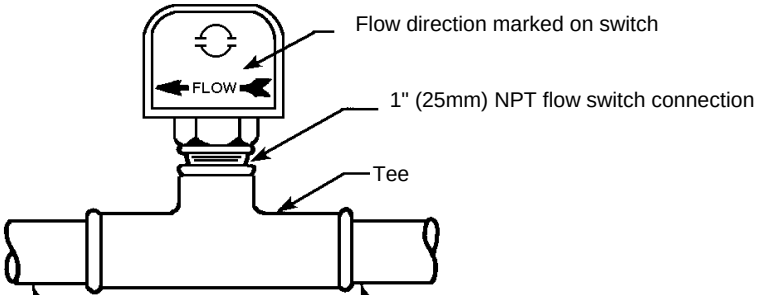
A flow switch is available from McQuay (part number 017503300). It is a "paddle" type switch and adaptable to any pipe size from 2" (51 mm) to 6" (152 mm) nominal. Certain minimum flow rates are required to close the switch and are listed in Table 7. Installation should be as shown in Figure 19. Connect the normally open contacts of the flow switch in the unit control center at terminals 44 and 61. There is also a set of normally closed contacts on the switch that can be used for an indicator light or an alarm to indicate when a "no flow" condition exists. Freeze protect any flow switch that is installed outdoors. Manufacturer's instructions included with the switch should be followed. **NOTE:** Differential pressure switches are not recommended for outdoor installation.

***Table 7, Flow Switch Minimum/Maximum Flow Rates***

| Nominal Pipe Size Inches (mm) | Minimum Required Flow To Activate Switch - gpm (l/m) | Maximum Flow Rate gpm (l/m) |
|---|---|---|
| 2 (50.8) | 13.7 (51.8) | 105 (397.4) |
| 2 1/2 (63.50 | 17.9 (67.8) | 149 (564.0) |
| 3 (76.20 | 24.2 (91.6) | 230 (870.6) |
| 4 (101.6) | 35.3 (134.0) | 397 (1502.7) |
| 5 (127.0) | 48.6 (184.0) | 654 (2475.4) |
| 6 (152.4) | 60.3 (228.0) | 900 (3406.5) |

**Note:** See pressure drop table on page 25 for minimum and maximum flow through the evaporator.

***Figure 19, Flow Switch Installation***




## Water Connections

Bring water piping to the evaporator through the side between the vertical supports. Provide taps for the connection of pressure gauges and thermometers in the inlet and outlet lines. Check the inlet and outlet labels on the unit against the certified drawings supplied on the job and be sure the water piping is hooked up correctly. Contact the McQuay sales office if any discrepancies exist.

## Variable Speed Pumping

Variable water flow involves lowering the water flow through the evaporator as the load decreases. McQuay chillers are designed for this duty provided that the rate of change in water flow is slow and the minimum and maximum flow rates for the vessel are not exceeded.

The recommended maximum change in water flow is 10 percent of the change per minute.

The water flow through the vessel must remain between the minimum and maximum values listed on page 25. If flow drops below the minimum allowable, large reductions in heat transfer can occur. If the flow exceeds the maximum rate, excessive pressure drop and tube erosion can occur.

## System Water Volume Considerations

All chillers need adequate time to recognize a load change, respond to the change and stabilize without short cycling the compressor. The water volume in the system and the size of the piping loop is a critical consideration. Good engineering practice is to have a minimum water volume of four times the flow rate (GPM) for comfort cooling applications. For process applications where the load can change quickly, contact the local McQuay sales office for recommendations. A water storage tank (provided by others) can be required to increase the system water volume in some systems.

Since there are many other factors that can influence performance, systems can successfully operate below these suggestions. However, as the water volume decreases below these suggestions, the possibility of problems increases. We believe that these guidelines should be an industry standard and not just recommendations from McQuay.

## Glycol Solutions

The use of a glycol/water mixture in the evaporator to prevent freezing will reduce system capacity and efficiency and increase pressure drop. The system capacity, required glycol solution flow rate, and pressure drop with glycol can be calculated using the following formulas and tables.

1. **Capacity** – Multiply the capacity based on water by the *Capacity* correction factor from Table 8 through Table 11.
2. **Flow** – Multiply the water evaporator flow by the *Flow* correction factor from Table 8 through Table 11 to determine the increased evaporator flow due to glycol.

   If the flow is unknown, it can be calculated from the following equation:

$$\text{Glycol Flow (gpm)} = \frac{24 \times \textit{Tons Capacity (glycol)}}{\textit{Delta} - T} \times \textit{Flow Correction Factor}$$

3. **Pressure drop** -- Multiply the water pressure drop from page 25 by *Pressure Drop* correction factor from Table 8 through Table 11. High concentrations of propylene glycol at low temperatures can cause unacceptably high-pressure drops.
4. **Power** -- Multiply the water system power by *Power* correction factor from Table 8 through Table 11.

Test coolant with a clean, accurate glycol solution hydrometer (similar to that found in service stations) to determine the freezing point. Obtain percent glycol from the freezing point table below. It is recommended that a minimum of 25% solution by weight be used for protection against corrosion or that additional compatible inhibitors be added.

**⚠ CAUTION**

**Do not use an automotive grade antifreeze. Industrial grade glycols must be used. Automotive antifreeze contains inhibitors which will cause plating on the copper tubes within the chiller evaporator. The type and handling of glycol used must be consistent with local codes.**

***Table 8, Ethylene Glycol Factors for Models AGZ 026BM to 070BM***

| % E.G. | Freeze Point | | Capacity | Power | Flow | PD |
|---|---|---|---|---|---|---|
| | °F | °C | | | | |
| **10** | 26 | -3.3 | 0.998 | 0.998 | 1.036 | 1.097 |
| **20** | 18 | -7.8 | 0.993 | 0.997 | 1.060 | 1.226 |
| **30** | 7 | -13.9 | 0.987 | 0.995 | 1.092 | 1.369 |
| **40** | -7 | -21.7 | 0.980 | 0.992 | 1.132 | 1.557 |
| **50** | -28 | -33.3 | 0.973 | 0.991 | 1.182 | 1.791 |

***Table 9, Propylene Glycol Factors for Models AGZ 026BM to 070BM***

| % P.G. | Freeze Point | | Capacity | Power | Flow | PD |
|---|---|---|---|---|---|---|
| | °F | °C | | | | |
| **10** | 26 | -3.3 | 0.995 | 0.997 | 1.016 | 1.100 |
| **20** | 19 | -7.2 | 0.987 | 0.995 | 1.032 | 1.211 |
| **30** | 9 | -12.8 | 0.978 | 0.992 | 1.057 | 1.380 |
| **40** | -5 | -20.6 | 0.964 | 0.987 | 1.092 | 1.703 |
| **50** | -27 | -32.8 | 0.952 | 0.983 | 1.140 | 2.251 |

***Table 10, Ethylene Glycol Factors for Models AGZ 075BM to 130BM***

| % E.G. | Freeze Point | | Capacity | Power | Flow | PD |
|---|---|---|---|---|---|---|
| | °F | °C | | | | |
| **10** | 26 | -3.3 | 0.994 | 0.998 | 1.038 | 1.101 |
| **20** | 18 | -7.8 | 0.982 | 0.995 | 1.063 | 1.224 |
| **30** | 7 | -13.9 | 0.970 | 0.992 | 1.095 | 1.358 |
| **40** | -7 | -21.7 | 0.955 | 0.987 | 1.134 | 1.536 |
| **50** | -28 | -33.3 | 0.939 | 0.983 | 1.184 | 1.755 |

***Table 11, Propylene Glycol Factors for Models AGZ 075BM to 130BM***

| % P.G. | Freeze Point | | Capacity | Power | Flow | PD |
|---|---|---|---|---|---|---|
| | °F | °C | | | | |
| **10** | 26 | -3.3 | 0.988 | 0.996 | 1.019 | 1.097 |
| **20** | 19 | -7.2 | 0.972 | 0.992 | 1.035 | 1.201 |
| **30** | 9 | -12.8 | 0.951 | 0.987 | 1.059 | 1.351 |
| **40** | -5 | -20.6 | 0.926 | 0.979 | 1.095 | 1.598 |
| **50** | -27 | -32.8 | 0.906 | 0.974 | 1.142 | 2.039 |

## Altitude Correction Factors

Performance tables are based at sea level. Elevations other than sea level affect the performance of the unit. The decreased air density will reduce condenser capacity, consequently reducing the unit's performance. For performance at elevations other than sea level refer to Table 12 or Table 13.

## Evaporator Temperature Drop Factors

Performance tables are based on a 10 degree F (5 degree C) temperature drop through the evaporator. Adjustment factors for applications with temperature ranges from 6 degree F to 16 degree F (3.3 degree C to 8.9 degree C) are found in Table 12 and Table 13. Ranges outside these temperatures can affect the control system's capability to maintain acceptable control and must not be used.

The maximum water temperature that can be circulated through the evaporator in a non-operating mode is 100°F (37.8°C).

## Fouling Factor

Performance tables are based on water with a fouling factor of:

$0.0001\,ft^2 \times hr \times °F / BTU \quad or \quad (0.0176 m^2 \times °C / kW)$ per ARI 550/590-98.

As fouling is increased, performance decreases. For performance at other than 0.0001 (0.0176) fouling factor, refer to Table 12 and Table 13. Foreign matter in the chilled water system will adversely affect the heat transfer capability of the evaporator and could increase the pressure drop and reduce the water flow. Maintain proper water treatment to provide optimum unit operation.

***Table 12, Capacity and Power Derates, Models AGZ 026 to 070***

| Altitude | Chilled Water Delta T | | Fouling Factor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.0001 (0.0176) | | 0.00025 (0.044) | | 0.00075 (0.132) | | 0.00175 (0.308) | |
| | °F | °C | Cap. | Power | Cap. | Power | Cap. | Power | Cap. | Power |
| Sea Level | 6 | 3.3 | 0.978 | 0.993 | 0.975 | 0.991 | 0.963 | 0.987 | 0.940 | 0.980 |
| | 8 | 4.4 | 0.989 | 0.996 | 0.986 | 0.994 | 0.973 | 0.990 | 0.950 | 0.983 |
| | 10 | 5.6 | 1.000 | 1.000 | 0.996 | 0.999 | 0.984 | 0.994 | 0.961 | 0.987 |
| | 12 | 6.7 | 1.009 | 1.003 | 1.005 | 1.001 | 0.993 | 0.997 | 0.969 | 0.990 |
| | 14 | 7.7 | 1.018 | 1.004 | 1.014 | 1.003 | 1.002 | 0.999 | 0.978 | 0.991 |
| | 16 | 8.9 | 1.025 | 1.007 | 1.021 | 1.006 | 1.009 | 1.001 | 0.985 | 0.994 |
| 2000 feet | 6 | 3.3 | 0.977 | 1.001 | 0.973 | 1.000 | 0.961 | 0.996 | 0.938 | 0.989 |
| | 8 | 4.4 | 0.987 | 1.006 | 0.984 | 1.004 | 0.971 | 1.000 | 0.948 | 0.993 |
| | 10 | 5.6 | 0.998 | 1.009 | 0.995 | 1.007 | 0.982 | 1.003 | 0.959 | 0.996 |
| | 12 | 6.7 | 1.007 | 1.011 | 1.004 | 1.010 | 0.991 | 1.006 | 0.967 | 0.998 |
| | 14 | 7.7 | 1.014 | 1.014 | 1.011 | 1.013 | 0.998 | 1.009 | 0.974 | 1.001 |
| | 16 | 8.9 | 1.022 | 1.016 | 1.018 | 1.014 | 1.005 | 1.010 | 0.981 | 1.003 |
| 4000 feet | 6 | 3.3 | 0.973 | 1.011 | 0.970 | 1.010 | 0.957 | 1.006 | 0.935 | 0.998 |
| | 8 | 4.4 | 0.984 | 1.014 | 0.980 | 1.013 | 0.968 | 1.009 | 0.945 | 1.001 |
| | 10 | 5.6 | 0.995 | 1.019 | 0.991 | 1.017 | 0.979 | 1.013 | 0.955 | 1.005 |
| | 12 | 6.7 | 1.004 | 1.021 | 1.000 | 1.020 | 0.987 | 1.016 | 0.964 | 1.008 |
| | 14 | 7.7 | 1.011 | 1.024 | 1.007 | 1.023 | 0.994 | 1.018 | 0.971 | 1.011 |
| | 16 | 8.9 | 1.018 | 1.027 | 1.014 | 1.026 | 1.002 | 1.021 | 0.978 | 1.014 |
| 6000 feet | 6 | 3.3 | 0.969 | 1.021 | 0.966 | 1.020 | 0.954 | 1.016 | 0.931 | 1.008 |
| | 8 | 4.4 | 0.980 | 1.026 | 0.977 | 1.024 | 0.964 | 1.020 | 0.942 | 1.013 |
| | 10 | 5.6 | 0.989 | 1.029 | 0.986 | 1.027 | 0.973 | 1.023 | 0.950 | 1.015 |
| | 12 | 6.7 | 0.998 | 1.033 | 0.995 | 1.031 | 0.982 | 1.027 | 0.959 | 1.020 |
| | 14 | 7.7 | 1.007 | 1.036 | 1.004 | 1.034 | 0.991 | 1.030 | 0.967 | 1.022 |
| | 16 | 8.9 | 1.014 | 1.037 | 1.011 | 1.036 | 0.998 | 1.031 | 0.974 | 1.024 |
| 8000 feet | 6 | 3.3 | 0.964 | 1.034 | 0.961 | 1.033 | 0.949 | 1.028 | 0.926 | 1.021 |
| | 8 | 4.4 | 0.975 | 1.037 | 0.971 | 1.036 | 0.959 | 1.031 | 0.936 | 1.024 |
| | 10 | 5.6 | 0.986 | 1.041 | 0.982 | 1.040 | 0.970 | 1.036 | 0.947 | 1.028 |
| | 12 | 6.7 | 0.995 | 1.044 | 0.991 | 1.043 | 0.979 | 1.038 | 0.955 | 1.031 |
| | 14 | 7.7 | 1.002 | 1.047 | 0.998 | 1.046 | 0.986 | 1.041 | 0.962 | 1.034 |
| | 16 | 8.9 | 1.009 | 1.050 | 1.005 | 1.049 | 0.993 | 1.044 | 0.969 | 1.037 |

### *Table 13, Capacity and Power Derates, Models AGZ 075 to 130*

| Altitude | Chilled Water Delta T | | Fouling Factor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.0001 (0.0176) | | 0.00025 (0.044) | | 0.00075 (0.132) | | 0.00175 (0.308) | |
| | °F | °C | Cap. | Power | Cap. | Power | Cap. | Power | Cap. | Power |
| Sea Level | 6 | 3.3 | 0.990 | 0.997 | 0.976 | 0.994 | 0.937 | 0.983 | 0.868 | 0.964 |
| | 8 | 4.4 | 0.994 | 0.998 | 0.981 | 0.995 | 0.942 | 0.984 | 0.872 | 0.965 |
| | 10 | 5.6 | 1.000 | 1.000 | 0.987 | 0.996 | 0.947 | 0.986 | 0.877 | 0.967 |
| | 12 | 6.7 | 1.005 | 1.001 | 0.991 | 0.997 | 0.951 | 0.986 | 0.881 | 0.968 |
| | 14 | 7.7 | 1.009 | 1.002 | 0.995 | 0.998 | 0.955 | 0.987 | 0.884 | 0.968 |
| | 16 | 8.9 | 1.013 | 1.004 | 1.000 | 1.000 | 0.960 | 0.989 | 0.889 | 0.970 |
| 2000 feet | 6 | 3.3 | 0.987 | 1.005 | 0.974 | 1.002 | 0.934 | 0.991 | 0.865 | 0.972 |
| | 8 | 4.4 | 0.992 | 1.006 | 0.979 | 1.003 | 0.940 | 0.992 | 0.870 | 0.973 |
| | 10 | 5.6 | 0.997 | 1.008 | 0.984 | 1.004 | 0.944 | 0.994 | 0.875 | 0.975 |
| | 12 | 6.7 | 1.002 | 1.009 | 0.989 | 1.005 | 0.949 | 0.994 | 0.879 | 0.975 |
| | 14 | 7.7 | 1.007 | 1.011 | 0.993 | 1.007 | 0.953 | 0.996 | 0.883 | 0.977 |
| | 16 | 8.9 | 1.011 | 1.012 | 0.998 | 1.008 | 0.958 | 0.997 | 0.887 | 0.978 |
| 4000 feet | 6 | 3.3 | 0.985 | 1.014 | 0.972 | 1.010 | 0.933 | 0.999 | 0.864 | 0.980 |
| | 8 | 4.4 | 0.991 | 1.015 | 0.977 | 1.012 | 0.938 | 1.001 | 0.869 | 0.981 |
| | 10 | 5.6 | 0.995 | 1.016 | 0.982 | 1.013 | 0.943 | 1.002 | 0.873 | 0.982 |
| | 12 | 6.7 | 1.000 | 1.018 | 0.987 | 1.014 | 0.947 | 1.003 | 0.877 | 0.984 |
| | 14 | 6.8 | 1.005 | 1.019 | 0.991 | 1.015 | 0.951 | 1.004 | 0.881 | 0.985 |
| | 16 | 8.9 | 1.009 | 1.021 | 0.995 | 1.017 | 0.955 | 1.006 | 0.884 | 0.987 |
| 6000 feet | 6 | 3.3 | 0.982 | 1.023 | 0.969 | 1.020 | 0.930 | 1.009 | 0.861 | 0.989 |
| | 8 | 4.4 | 0.988 | 1.025 | 0.975 | 1.022 | 0.935 | 1.010 | 0.866 | 0.991 |
| | 10 | 5.6 | 0.992 | 1.026 | 0.979 | 1.022 | 0.940 | 1.011 | 0.870 | 0.992 |
| | 12 | 6.7 | 0.997 | 1.028 | 0.984 | 1.024 | 0.944 | 1.013 | 0.875 | 0.994 |
| | 14 | 7.7 | 1.002 | 1.029 | 0.989 | 1.025 | 0.949 | 1.014 | 0.879 | 0.995 |
| | 16 | 8.9 | 1.006 | 1.031 | 0.992 | 1.027 | 0.952 | 1.016 | 0.882 | 0.996 |
| 8000 feet | 6 | 3.3 | 0.979 | 1.034 | 0.966 | 1.031 | 0.927 | 1.019 | 0.859 | 1.000 |
| | 8 | 4.4 | 0.984 | 1.036 | 0.971 | 1.032 | 0.932 | 1.021 | 0.863 | 1.002 |
| | 10 | 5.6 | 0.990 | 1.037 | 0.976 | 1.033 | 0.937 | 1.022 | 0.868 | 1.002 |
| | 12 | 6.7 | 0.993 | 1.039 | 0.980 | 1.035 | 0.941 | 1.024 | 0.871 | 1.004 |
| | 14 | 7.7 | 0.998 | 1.041 | 0.985 | 1.037 | 0.945 | 1.026 | 0.875 | 1.006 |
| | 16 | 8.9 | 1.003 | 1.041 | 0.990 | 1.038 | 0.950 | 1.026 | 0.879 | 1.007 |

# ACZ Staging and Circuiting

All ACZ units have two circuits, each with either two compressors, or three compressors on models ACZ 120 through 155. These circuits must be kept separated throughout the entire refrigerant piping system. Each unit refrigerant circuit must be piped to a separate coil or to a separate air handler (with a single coil).

Temperature control for each evaporator coil is provided by the installer through field-supplied and wired temperature controllers. The field-supplied staging signals are field-wired to the Microtech II controller that correspondingly activates and deactivates the scroll compressors. The MicroTech II controller has a menu screen (See operating manual OM AGZ) that allows selection between "Unit' and "Circuit".

Select "Unit" for a single air handler with row control where it does not matter which circuit starts first. When the controller gets a signal to start Stage 1 of cooling, it will start the compressor, on *either* circuit, with the fewest number of starts, so either circuit can start first. Energizing stage 2 will start the compressor with the fewest starts *on the other circuit*. Further staging requests will continue to start alternate compressors between the two circuits.

For applications where the staging must be associated with a particular circuit (face-split coils or separate air handlers), select "Circuit". In this mode, stages 1, 2, and 3 are connected to refrigerant circuit #1 and stages 4, 5,and 6 to refrigerant circuit #2. As the thermostat for coil #1 stages up, the microprocessor will start the compressors on circuit # 1 (compressors 1, 3 and 5). Compressors 5 and 6 are found only on the six compressor units.

The field supplied temperature controller is required to close normally open 24-volt contacts on a demand for cooling. These closure signals are field wired to the terminal strip (TB3) in the condensing unit. Refer to the field wiring diagram (page 51) for details. The following control staging is required:

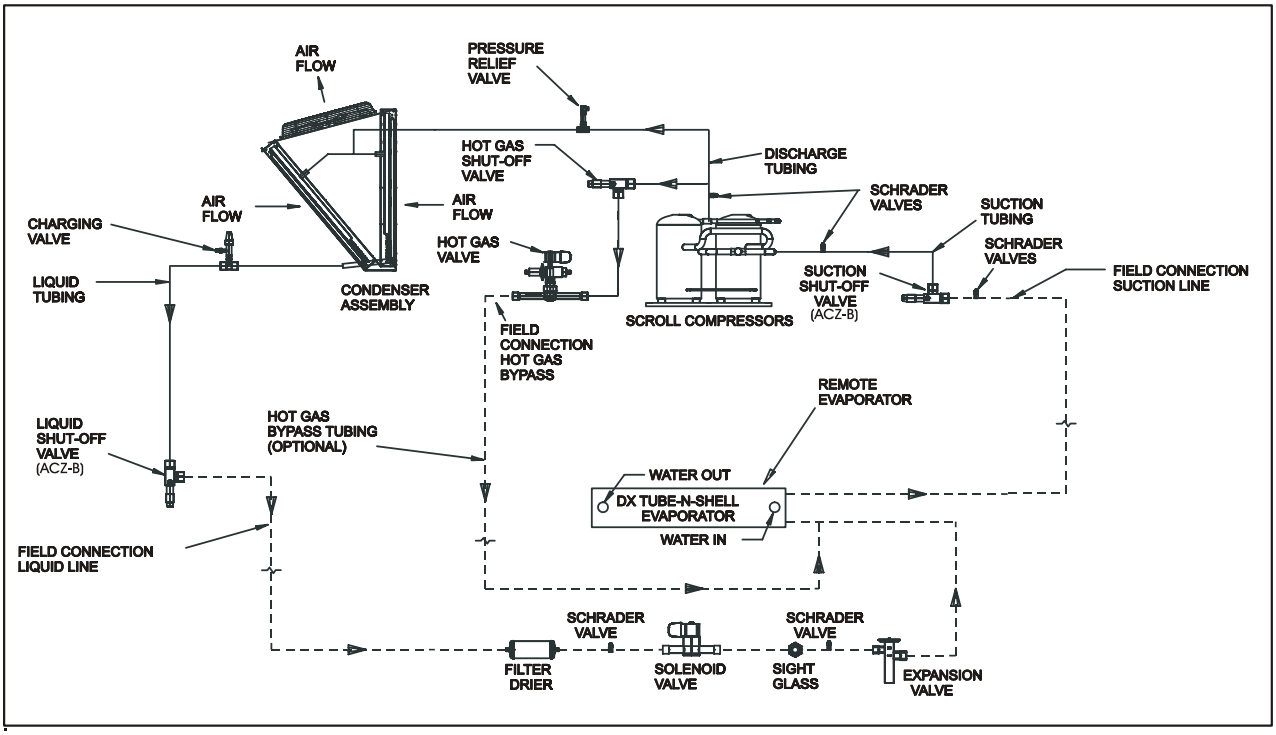
| Condensing Unit Model | Number of Capacity Steps | Number of Required Contact Closure Signals |
|---|---|---|
| ACZ-030B through 110B | 4 | 4 |
| ACZ-120B through 155B | 6 | 6 |

In summary:

- Evaporator coil #1 must be piped to the condensing unit circuit #1. See dimension drawings beginning on page 52. Evaporator coil #2 must be piped to the condensing unit circuit #2. See dimension drawings beginning on page 52 for circuit locations.
- Evaporator staging thermostat for coil #1 must be wired to the unit terminal board TB3, stages 1, and 2 (and 3 on models 120 through 155). Evaporator staging thermostat for coil #222 must be wired to the unit terminal board TB3, stages 4, and 5 (and 6 on models 120 through 155).

# Remote Evaporator Refrigerant Piping

***Figure 20, AGZ-BM, Remote Evaporator Piping Schematic***




## Refrigerant Specialties:

AGZ-BM Remote Evaporator Chillers: Refrigerant specialties including the expansion valves, solenoid valves, filter-drier and sight glasses for use with the AGZ-BM remote evaporator models are supplied by McQuay but require field installation. The remaining components including fittings and Schrader valves are provided and piped by the installer.

The hot gas bypass valve with solenoid valve option can be provided as a field-installed or factory installed option.

ACZ-B Condensing Units: No Refrigerant specialties are furnished on the ACZ condensing units. A variety of evaporator types, other than a water chiller as shown in the above diagram, may be used. Very often these may be air handlers with multiple-circuited coils. If multiple evaporator circuits and expansion valves are used, they must be piped so that only two circuits end up being piped back to the condensing unit, matching the unit's two refrigerant circuits. Each circuit must have a solenoid valve with a filter-drier installed ahead of it installed close to the evaporator.

The hot gas bypass valve with solenoid valve option can be provided as a field-installed or factory installed option.

Unit-Mounted Valves: Both the ACZ-B and the AGZ-BM outdoor sections have a liquid line shutoff valve and a suction shutoff valve factory mounted as standard.

## Refrigerant Piping

All field piping, wiring, and procedures must be performed in accordance with ASHRAE, EPA, and industry standards. Proper refrigerant piping can make the difference between a reliable system and an inefficient, problematic system.

The primary concerns related to piping are refrigerant pressure drop, a solid liquid feed to the expansion valves, continuous oil return and properly sized refrigerant specialties.

Insulate the suction line to reduce excessive superheat build-up. Insulate the liquid line, where located in areas above ambient temperature, to prevent loss of subcooling and consequent liquid flashing.

A holding charge of R-22 is provided for the evaporator (AGZ-BM) and the outdoor section. The installer must properly evacuate the piping system and provide the operating charge of R22. Refer to the piping schematic drawing on page 22 for additional details.

The recommended source for refrigerant piping techniques and sizing is the ASHRAE 2002 Refrigeration Handbook, chapter 2.

Although conflicting piping recommendations can be found in different sources, McQuay offers the following recommendations for these controversial issues.

The use of double risers for vertical gas risers is generally not required and should be used only as a last resort to maintain the minimum refrigerant flow to carry oil up the vertical risers. Slightly downsizing the vertical riser is a preferable option to providing double risers.

Slope the refrigerant lines 1" per 10 feet of horizontal run in the direction of refrigerant flow to assist oil return.

Resist using hot gas bypass for applications when operation in ambient temperature below 40 degrees is expected. This recommendation helps to maintain adequate condensing pressures and liquid refrigerant at the expansion valve when condenser capacities are at their maximum.

Pressure drops in the refrigerant lines should be maintained at or below the ASHRAE recommendations and line lengths should be made as short as possible. Exceeding these recommendations will decrease performance and could impact reliability.

Small traps should be provided at the base of each major vertical gas riser to assist in the collection of oil. If vertical risers exceed more than 25 feet, install a small trap at the midpoint and at a maximum of 20 foot intervals.

Use caution in sizing the liquid line in applications where the evaporator is above the outdoor section. The weight of the liquid refrigerant in the vertical column will decrease the pressure at the top of the riser (approximately 0.5 psi per foot of vertical rise) allowing some of the refrigerant to flash to a gas. Adequate refrigerant subcooling is needed at the outdoor section to prevent large volumes of refrigerant gas at the expansion valve.

The piping systems should always extend above the highest component in the refrigeration system before dropping down to make the final refrigerant connections to components. This practice will hinder the draining of condensed refrigerant to the lower component when normal shutdown procedures do not occur (such as a power failure).

**NOTE:** Do not run refrigerant piping underground.

### Pumpdown

The pumpdown capacity of ACZ/AGZ units is given in the Physical Data Tables. Care should be exercised to include all equipment and lines when calculating the system charge relative to the unit's pumpdown capacity. The AGZ-BM remote evaporators have an insignificant operating charge.

# Chilled Water Flow Switch

A water flow switch must be mounted in the leaving chilled water line to prove that there is adequate water flow to the evaporator before the unit can start. It also serves to shut down the unit in the event that water flow is interrupted in order to guard against evaporator freeze-up.

A flow switch is available from McQuay under ordering number 017503300. It is a paddle-type switch and adaptable to any pipe size from 1" (25mm) to 8" (203mm) nominal.

***Table 14, Flow Switch Settings***

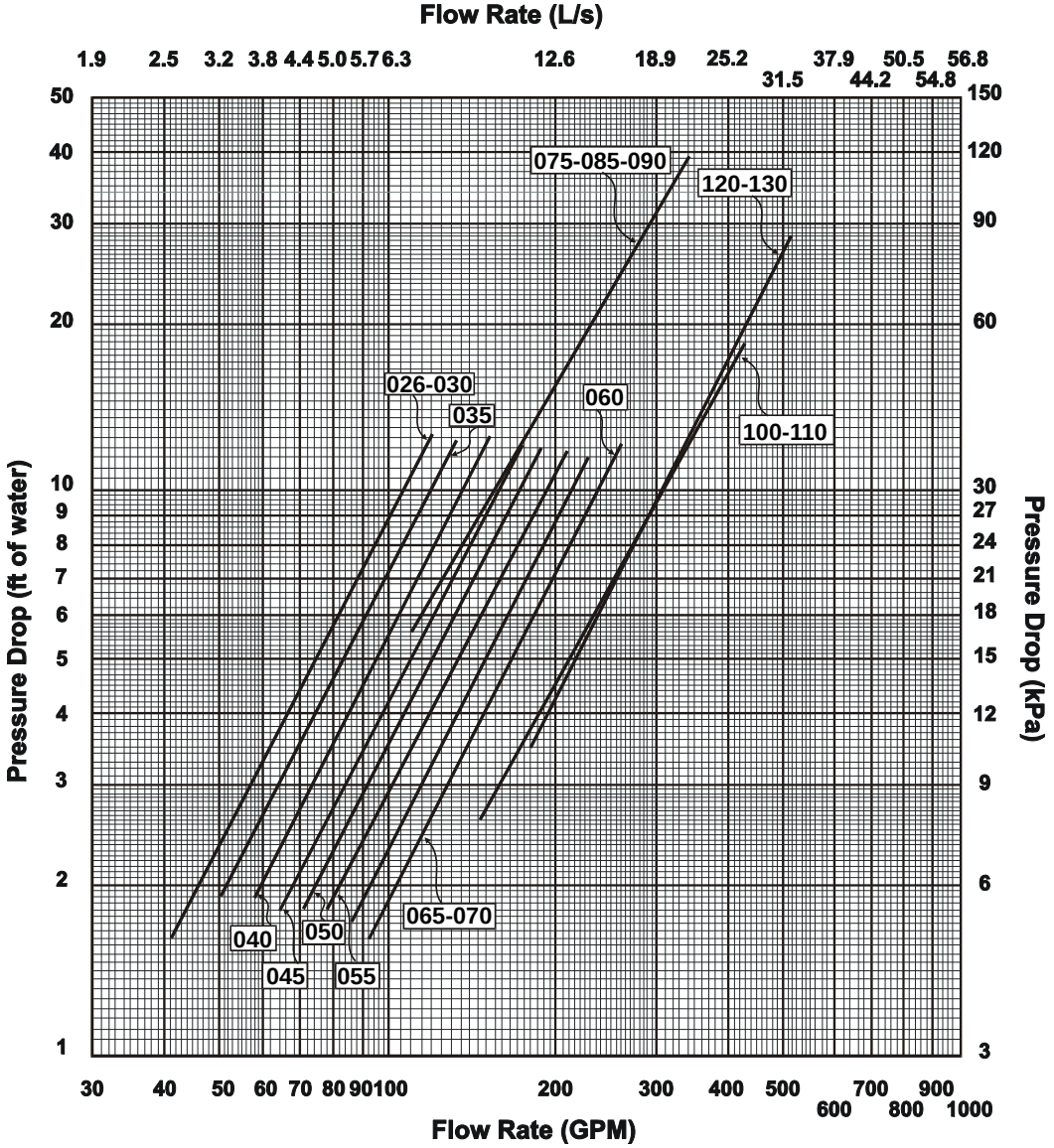
| Pipe Size (NOTE !) | | inch | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mm | 32 (2) | 38 (2) | 51 | 63 (3) | 76 | 102 (4) | 127 (4) | 153 (4) | 204 (5) |
| Min. Adjst. | Flow | gpm | 5.8 | 7.5 | 13.7 | 18.0 | 27.5 | 65.0 | 125.0 | 190.0 | 205.0 |
| | | Lpm | 1.3 | 1.7 | 3.1 | 4.1 | 6.2 | 14.8 | 28.4 | 43.2 | 46.6 |
| | No Flow | gpm | 3.7 | 5.0 | 9.5 | 12.5 | 19.0 | 50.0 | 101.0 | 158.0 | 170.0 |
| | | Lpm | 0.8 | 1.1 | 2.2 | 2.8 | 4.3 | 11.4 | 22.9 | 35.9 | 38.6 |
| Max. Adjst. | Flow | gpm | 13.3 | 19.2 | 29.0 | 34.5 | 53.0 | 128.0 | 245.0 | 375.0 | 415.0 |
| | | Lpm | 3.0 | 4.4 | 6.6 | 7.8 | 12.0 | 29.1 | 55.6 | 85.2 | 94.3 |
| | No Flow | gpm | 12.5 | 18.0 | 27.0 | 32.0 | 50.0 | 122.0 | 235.0 | 360.0 | 400.0 |
| | | Lpm | 2.8 | 4.1 | 6.1 | 7.3 | 11.4 | 27.7 | 53.4 | 81.8 | 90.8 |

**NOTES:**

1. A segmented 3-inch paddle (1, 2, and 3 inches) is furnished mounted, plus a 6-inch paddle loose.
2. Flow rates for a 2-inch paddle trimmed to fit the pipe.
3. Flow rates for a 3-inch paddle trimmed to fit the pipe.
4. Flow rates for a 3-inch paddle.
5. Flow rates for a 6-inch paddle.

# Evaporator Flow and Pressure Drop

***Figure 21, AGZ 026BM – 130BM, Remote Evaporator Pressure Drop***




| AGZ Unit Model | Minimum | | | | Nominal | | | | Maximum | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inch-Pound | | S.I. | | Inch-Pound | | S.I. | | Inch-Pound | | S.I. | |
| | gpm | DP ft. | lps | DP kpa | gpm | DP ft. | lps | DP kpa | gpm | DP ft. | lps | DP kpa |
| 026B | 41 | 1.6 | 2.6 | 4.7 | 65 | 3.9 | 4.1 | 11.6 | 109 | 10.4 | 6.9 | 30.9 |
| 030B | 45 | 1.9 | 2.9 | 5.7 | 72 | 4.7 | 4.6 | 14.1 | 121 | 12.7 | 7.6 | 37.8 |
| 035B | 50 | 1.9 | 3.1 | 5.6 | 80 | 4.6 | 5.0 | 13.8 | 133 | 12.4 | 8.4 | 36.9 |
| 040B | 58 | 1.9 | 3.6 | 5.7 | 92 | 4.7 | 5.8 | 14.0 | 154 | 12.6 | 9.7 | 37.5 |
| 045B | 64 | 1.8 | 4.0 | 5.4 | 102 | 4.5 | 6.4 | 13.4 | 170 | 12.1 | 10.7 | 35.9 |
| 050B | 71 | 1.8 | 4.4 | 5.4 | 113 | 4.5 | 7.1 | 13.3 | 188 | 12.0 | 11.9 | 35.7 |
| 055B | 78 | 1.8 | 4.9 | 5.3 | 125 | 4.4 | 7.9 | 13.0 | 209 | 11.7 | 13.2 | 34.8 |
| 060B | 86 | 1.7 | 5.4 | 5.2 | 137 | 4.3 | 8.6 | 12.8 | 228 | 11.5 | 14.4 | 34.2 |
| 065B | 92 | 1.6 | 5.8 | 4.9 | 147 | 4.1 | 9.3 | 12.1 | 246 | 10.9 | 15.5 | 32.5 |
| 070B | 98 | 1.9 | 6.2 | 5.6 | 157 | 4.6 | 9.9 | 13.7 | 262 | 12.3 | 16.5 | 36.8 |
| 075B | 111 | 5.6 | 7.0 | 16.5 | 177 | 12.5 | 11.2 | 37.4 | 295 | 30.4 | 18.6 | 90.7 |
| 085B | 119 | 6.3 | 7.5 | 18.9 | 191 | 14.3 | 12.1 | 42.7 | 318 | 34.8 | 20.1 | 103.6 |
| 090B | 128 | 7.2 | 8.1 | 21.4 | 205 | 16.2 | 12.9 | 48.4 | 342 | 39.4 | 21.6 | 117.3 |
| 100B | 146 | 2.6 | 9.2 | 7.7 | 234 | 6.1 | 14.8 | 18.2 | 390 | 15.5 | 24.6 | 46.2 |
| 110B | 161 | 3.1 | 10.2 | 9.2 | 258 | 7.3 | 16.3 | 21.7 | 430 | 18.5 | 27.1 | 55.1 |
| 120B | 180 | 3.5 | 11.3 | 10.4 | 288 | 8.9 | 18.1 | 26.5 | 479 | 24.6 | 30.2 | 73.4 |
| 130B | 194 | 4.1 | 12.2 | 12.1 | 311 | 10.4 | 19.6 | 30.9 | 518 | 28.7 | 32.7 | 85.6 |

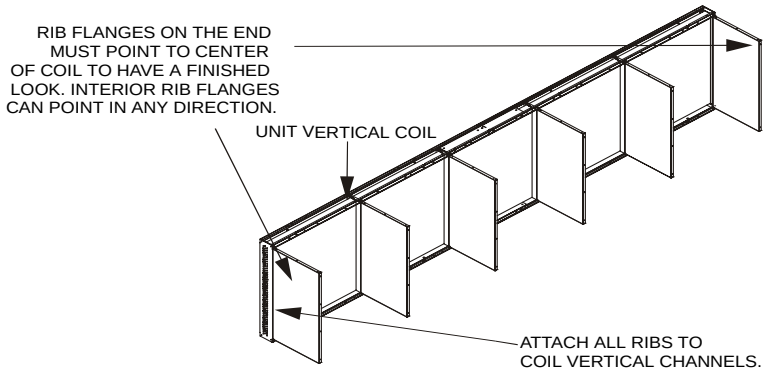
NOTE: Minimum and maximum flows are established to ensure the Delta-T for each unit size falls within the 6 - 16°F range for proper unit control. The unit must operate within these values.

# Wind Baffles and Hail Guards

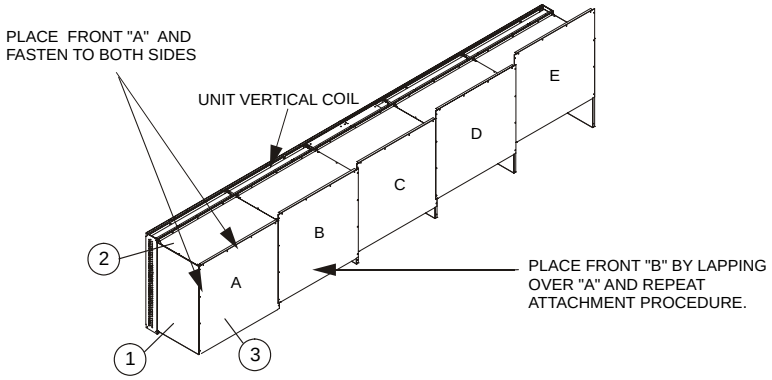
Wind Baffles/Hail Guards are a field-installed option that is used to stabilize unit operation in high wind areas and to assist in operation at low ambient temperatures. Figure 22 is a sketch of a typical panel assembly on an ACZ/AGZ unit. The actual number of panels and parts will vary by model size. The parts are shown in the table below and referenced by balloon numbers.

***Figure 22, Installation Sequence***

**Rib Attachment (First)**




**Front Panel Attachment (Second)**




**Top Panel Attachment (Last)**

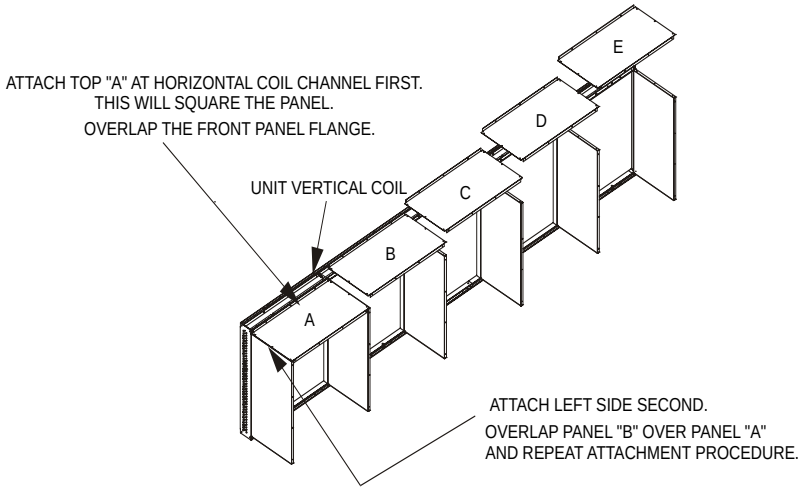
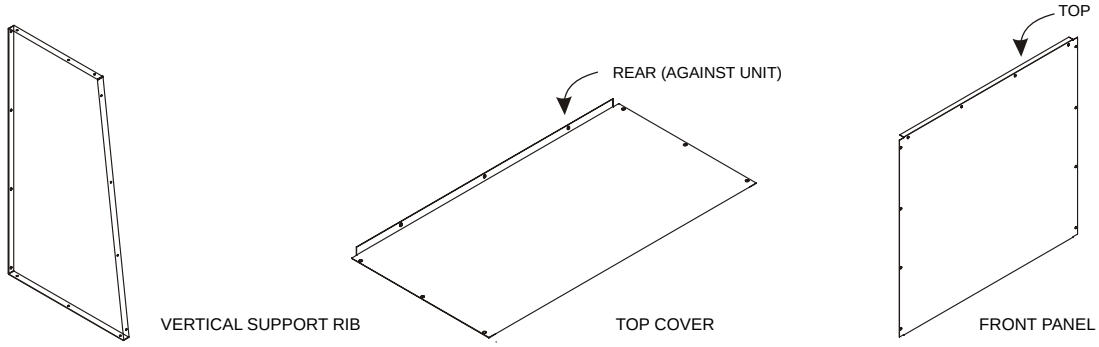


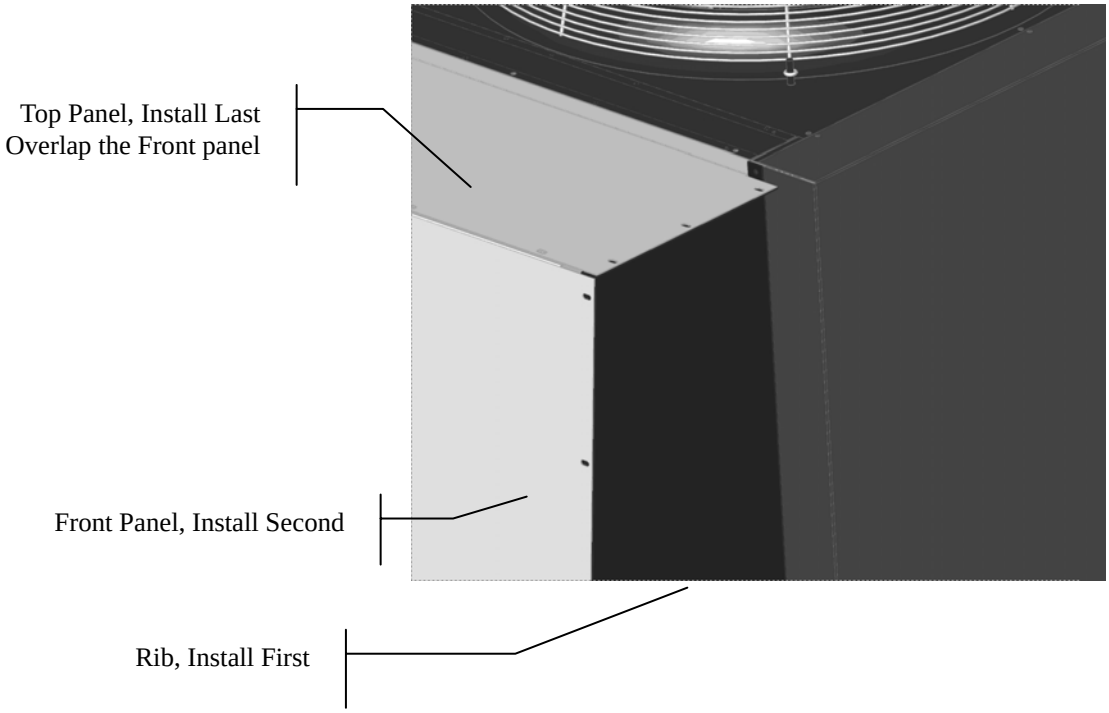

***Table 15, Packing List***

| Description | Part Number | Bubble Number |
|---|---|---|

| | | |
|---|---|---|
| Vertical Support Rib | 074758501 | 1 |
| Top Cover | 330409401 | 2 |
| Front Panel | 330409501 | 3 |
| ¼ - 20 x ½" Screw (Place in Poly Bag) | 046093807 | |

***Figure 23, Components***



# Physical Data

### *Table 16, ACZ 030B - 040B, AGZ 026BM – 035BM*

| PHYSICAL DATA | MODEL NUMBER | | | | | |
|---|---|---|---|---|---|---|
| | ACZ 030B, AGZ 026BM | | ACZ 035B AGZ 030BM | | ACZ 040B AGZ 035BM | |
| **BASIC DATA** | **Ckt.1** | **Ckt.2** | **Ckt.1** | **Ckt.2** | **Ckt.1** | **Ckt.2** |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-22, Lbs. | 22 | 22 | 22 | 27 | 27 | 27 |
| Unit Operating Charge, R-22, kg | 10 | 10 | 10 | 12 | 12 | 12 |
| Cabinet Dimensions, LxWxH, In. | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | |
| Unit Operating Weight, Lb (kg) | 3600 (1634) | | 3600 (1634) | | 3600 (1634) | |
| Unit Shipping Weight, Lb (kg) | 3550 (1612) | | 3550 (1612) | | 3550 (1612) | |
| Add'l. Weight If Copper Finned Coils, Lb. (kg) | 284 (129) | | 284 (129) | | 284 (129) | |
| **COMPRESSORS** | | | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 7.5 | 7.5 | 7.5 | 9.0 | 9.0 | 9.0 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, Oz. | 140 | 140 | 140 | 140 | 140 | 140 |
| Oil Charge Per Compressor, (g) | (496) | (496) | (496) | (496) | (496) | (496) |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 0-23-50-73-100 | | 0-25-50-75-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 0-27-50-77-100 | | 0-25-50-75-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | |
| Coil Face Area Sq. Ft. | 26.3 | 26.3 | 26.3 | 26.3 | 26.3 | 26.3 |
| Coil Face Area, ($M^2$) | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 |
| Finned Height x Finned Length, In. | 50x75.6 | 50x75.6 | 50x75.6 | 50x75.6 | 50x75.6 | 50x75.6 |
| Finned Height x Finned Length, (mm) | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 49 (22) | 49 (22) | 49 (22) | 49 (22) | 49 (22) | 49 (22) |
| Maximum Relief Valve Pressure Setting, psig (kPa) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | |
| Number Of Fans - Fan Diameter, In. (mm) | 4 – 30 (762) | | 4 – 30 (762) | | 4 – 30 (762) | |
| Number Of Motors - HP (kW) (2) | 4 – 1.0 | | 4 – 1.0 | | 4 – 1.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (M/Sec) | 8950 (4224) | | 8950 (4224) | | 8950 (4224) | |
| 60 Hz Total Unit Airflow, CFM ($M^3$/sec) | 24,316 (11,478) | | 24,316 (11,478) | | 24,316 (11,478) | |
| | | | | | | |
| **REMOTE EVAPORATOR - BRAZED PLATE (AGZ-BM ONLY)** | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Water Volume, Gallons, (L) | 4.3 (16.4) | | 5.0 (18.9) | | 5.7 (21.4) | |
| Maximum Water Pressure, psig (kPa) | 363 (2503) | | 363 (2503) | | 363 (2503) | |
| Max. Refrig. Working Pressure, psig (kPa) | 450 (3102) | | 450 (3102) | | 450 (3102) | |
| Water Inlet / Outlet Victaulic Conn. In. (mm) | 3 (76) | | 3 (76) | | 3 (76) | |
| Drain - NPT int., In. (mm) | Field | | Field | | Field | |
| Vent - NPT int., In. (mm) | Field | | Field | | Field | |

**NOTES:**

1. Nominal capacity based on 95°F ambient air and 50°F SST.
2. Except for 380V/60 & 575V/60, HP = 2.0

### *Table 17, ACZ 045B - 060B, AGZ 040BM – 055BM*

| PHYSICAL DATA | MODEL NUMBER | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ACZ 045B AGZ 040BM | | ACZ 050B AGZ 045BM | | ACZ 055B AGZ 050BM | | ACZ 060B AGZ 055BM | |
| **BASIC DATA** | **Ckt.1** | **Ckt.1** | **Ckt.2** | **Ckt.1** | **Ckt.2** | **Ckt.1** | **Ckt.2** | **Ckt.2** |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-22, lbs. | 31 | 31 | 37 | 37 | 37 | 37 | 44 | 44 |
| Unit Operating Charge, R-22, kg | 14 | 14 | 17 | 17 | 17 | 17 | 20 | 20 |
| Cabinet Dimensions, LxWxH, in. | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 2398 x 2235 x 2250 | | 2398 x 2235 x 2250 | | 2398 x 2235 x 2250 | | 2398 x 2235 x 2250 | |
| Unit Operating Weight, Lbs. (kg) | 3610 (1639) | | 3650 (1657) | | 3800 (1725) | | 3850 (1748) | |
| Unit Shipping Weight, Lbs. (kg) | 3550 (1612) | | 3590 (1630) | | 3730 (1693) | | 3780 (1716) | |
| Add'l. Weight If Copper Finned Coils, lbs. (kg) | 288 (130) | | 288 (130) | | 476 (130) | | 476 (130) | |
| **COMPRESSORS** | | | | | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 10.0 | 10.0 | 10.0 | 13.0 | 13.0 | 13.0 | 13.0 | 15.0 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, oz. | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 |
| Oil Charge Per Compressor, (g) | (496) | (496) | (496) | (496) | (496) | (496) | (496) | (496) |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 0-22-50-46-100 | | 0-25-50-75-100 | | 0-25-50-75-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 0-28-50-85-100 | | 0-25-50-75-100 | | 0-25-50-75-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | | | |
| Coil Face Area, sq. ft. (Note 1) | 26.3 | 26.3 | 44.1 | 44.1 | 44.1 | 44.1 | 44.1 | 44.1 |
| Coil Face Area (sq. M) | 2.4 | 2.4 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 |
| Finned Height x Finned Length, in. | 50x75.6 | 50x75.6 | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 |
| Finned Height x Finned Length, (mm) | 1270 x 1920 | 1270 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 2 | 16 x 2 | 16 x 2 | 16 x 2 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 49 (22) | 49 (22) | 60(27) | 60(27) | 60(27) | 60(27) | 82 (37) | 82 (37) |
| Maximum Relief Valve Pressure Setting, psig (kPa) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 4 – 30 (762) | | 4 – 30 (762) | | 4 – 30 (762) | | 4 – 30 (762) | |
| Number Of Motors - HP (kW) (Note 2)) | 4 – 1.5 | | 4 – 1.5 | | 4 – 1.5 | | 4 – 1.5 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (4224) | | 8950 (4224) | | 8950 (4224) | | 8950 (4224) | |
| 60 Hz Total Unit Airflow, CFM ($m^3$/sec) | 39,600 (18,692) | | 39,600 (18,692) | | 37,228 (17,572) | | 37,228 (17,572) | |
| | | | | | | | | |
| **REMOTE EVAPORATOR - BRAZED PLATE (AGZ-BM ONLY)** | | | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Water Volume, Gallons, (L) | 6.3 (23.9) | | 7.2 (27.3) | | 8.1 (30.7) | | 9.2 (34.9) | |
| Maximum Water Pressure, psig (kPa) | 363 (2503) | | 363 (2503) | | 363 (2503) | | 363 (2503) | |
| Maximum Refrigerant Working Pressure, psig (kPa) | 450 (3102) | | 450 (3102) | | 450 (3102) | | 450 (3102) | |
| Water Inlet / Outlet Victaulic Conn., in. (mm) | 3 (76) | | 3 (76) | | 3 (76) | | 3 (76) | |
| Drain - NPT int., in. (mm) | Field | | Field | | Field | | Field | |
| Vent - NPT int., in. (mm) | Field | | Field | | Field | | Field | |

**NOTES:**
1. The AGZ 040 condenser is the same as the AGZ 045.
2. Except for 380V/60 & 575V/60, HP = 2.0

### *Table 18, ACZ 065B - 080B, AGZ 060BM – 070BM*

| PHYSICAL DATA | MODEL NUMBER | | | | | |
|---|---|---|---|---|---|---|
| | ACZ 065B AGZ 060BM | | ACZ 070B AGZ 065BM | | ACZ 080B AGZ 070BM | |
| **BASIC DATA** | **Ckt.1** | **Ckt.2** | **Ckt.1** | **Ckt.2** | **Ckt.1** | **Ckt.2** |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-22, lbs. | 44 | 44 | 50 | 57 | 57 | 57 |
| Unit Operating Charge, R-22, kg | 20 | 20 | 23 | 26 | 26 | 26 |
| Cabinet Dimensions, LxWxH, in. | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | |
| Unit Operating Weight, Lbs. (kg) | 4040 (1834) | | 4070 (1848) | | 4180 (1898) | |
| Unit Shipping Weight, Lbs. (kg) | 3820 (1734) | | 3970 (1802) | | 4080 (1852) | |
| Add'l Weight If Copper Finned Coils, lbs. (kg) | 476 (216) | | 568 (258) | | 568 (258) | |
| **COMPRESSORS** | | | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 15.0 | 15.0 | 15.0 | 15 / 20 | 15 / 20 | 15 / 20 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, oz. | 140 | 140 | 140 | 140 /148 | 140 /148 | 140 /148 |
| Oil Charge Per Compressor, (g) | (496) | (496) | (496) | 496/ 525 | 496/ 525 | 496/ 525 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 0-23-46-77-100 | | 0-25-50-75-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 0-31-46-69-100 | | 0-25-50-75-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | |
| Coil Face Area, sq. ft. | 44.1 | 44.1 | 52.6 | 52.6 | 52.6 | 52.6 |
| Coil Face Area, ($m^2$) | 4.1 | 4.1 | 4.9 | 4.9 | 4.9 | 4.9 |
| Finned Height x Finned Length, in. | 42x75.6 | 42x75.6 | 100x75.6 | 100x75.6 | 100x75.6 | 100x75.6 |
| Finned Height x Finned Length, (mm) | 1067 x 1920 | 1067 x 1920 | 2540 x 1920 | 2540 x 1920 | 2540 x 1920 | 2540 x 1920 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 82 (37 | 82 (37 | 98 (44 | 98 (44 | 98 (44 | 98 (44 |
| Maximum Relief Valve Pressure Setting, psig (kPa) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 4 – 30 (762) | | 4 – 30 (762) | | 4 – 30 (762) | |
| Number Of Motors - HP (kW) (1) | 4 – 1.5 | | 4 – 2.0 | | 4 – 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (4224) | | 8950 (4224) | | 8950 (4224) | |
| 60 Hz Total Unit Airflow, CFM ($m^3$/sec) | 37,228 (17,572 | | 43,452 (20,510) | | 43,452 (20,510) | |
| | | | | | | |
| **REMOTE EVAPORATOR - BRAZED PLATE (AGZ-BM ONLY)** | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Water Volume, Gallons, (L) | 9.2 (34.9) | | 11.2 (42.5) | | 11.2 (42.5) | |
| Maximum Water Pressure, psig (kPa) | 363 (2503) | | 363 (2503) | | 363 (2503) | |
| Maximum Refrigerant Working Press., psig (kPa) | 450 (3102) | | 450 (3102) | | 450 (3102) | |
| Water Inlet / Outlet Victaulic Conn., in. (mm) | 3 (76) | | 3 (76) | | 3 (76) | |
| Drain - NPT int, in. (mm) | Field | | Field | | Field | |
| Vent - NPT int, in. (mm) | Field | | Field | | Field | |

**NOTE:** Except for 380V/60 & 575V/60, HP = 2.0

### *Table 19, ACZ 090B - 110B, AGZ 075BM – 090BM*

| PHYSICAL DATA | MODEL NUMBER | | | | | |
|---|---|---|---|---|---|---|
| | ACZ 090B AGZ 075BM | | ACZ 100B AGZ 085BM | | ACZ 110B AGZ 090BM | |
| **BASIC DATA** | **Ckt.1** | **Ckt.2** | **Ckt.1** | **Ckt.2** | **Ckt.1** | **Ckt.2** |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-22, lbs. | 56 | 56 | 56 | 66 | 66 | 66 |
| Unit Operating Charge, R-22, (kg) | 25 | 25 | 25 | 30 | 30 | 30 |
| Cabinet Dimensions, LxWxH, in. | 134.9 x 88.0 x 100.4 | | 134.9 x 88.0 x 100.4 | | 134.9 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 3426 x 2235 x 2550 | | 3426 x 2235 x 2550 | | 3426 x 2235 x 2550 | |
| Unit Operating Weight, Lbs. (kg) | 5630 (2556) | | 5790 (2629) | | 5950 (2701) | |
| Unit Shipping Weight, Lbs. (kg) | 5510 (2502) | | 5670 (2574) | | 5830 (2647) | |
| Add'l Weight If Copper Finned Coils, lbs. (kg) | 870 (395) | | 870 (395) | | 870 (395) | |
| **COMPRESSORS** | | | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 20.0 | 20.0 | 20.0 | 25.0 | 25.0 | 25.0 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, oz. | 148 | 148 | 148 | 200 | 200 | 200 |
| Oil Charge Per Compressor, (g) | (525) | (525) | (525) | (709) | (709) | (709) |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 0-22-50-72-100 | | 0-25-50-75-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 0-28-50-78-100 | | 0-25-50-75-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | |
| Coil Face Area, sq. ft. | 78.8 | 78.8 | 78.8 | 78.8 | 78.8 | 78.8 |
| Coil Face Area, ($m^2$) | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 |
| Finned Height x Finned Length, in. | 50 x113.4 | 50 x113.4 | 50 x113.4 | 50 x113.4 | 50 x113.4 | 50 x113.4 |
| Finned Height x Finned Length, (mm) | 1270 x 2880 | 1270 x 2880 | 1270 x 2880 | 1270 x 2880 | 1270 x 2880 | 1270 x 2880 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 147 (67) | 147 (67) | 147 (67) | 147 (67) | 147 (67) | 147 (67) |
| Maximum Relief Valve Pressure Setting, psig (kPa) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 6 – 30 (762) | | 6 – 30 (762) | | 6 – 30 (762) | |
| Number Of Motors - HP (kW) | 6 – 2.0 | | 6 – 2.0 | | 6 – 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (4224) | | 8950 (4224) | | 8950 (4224) | |
| 60 Hz Total Unit Airflow, CFM ($m^3$/sec) | 65,178 (30,765) | | 65,178 (30,765) | | 65,178 (30,765) | |
| | | | | | | |
| **REMOTE EVAPORATOR - SHELL AND TUBE (AGZ-BM ONLY)** | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Diameter, in. - Length, ft. | 14.0 x 5.2 | | 14.0 x 5.2 | | 14.0 x 5.2 | |
| Diameter, (mm) – Length, (mm) | 356 x 1585 | | 356 x 1585 | | 356 x 1585 | |
| Water Volume, Gallons, (L) | 25 (95) | | 25 (95) | | 25 (95) | |
| Maximum Water Pressure, psig (kPa) | 152 (1047) | | 152 (1047) | | 152 (1047) | |
| Maximum Refrigerant Working Pressure, psig (kPa) | 300 (2066) | | 300 (2066) | | 300 (2066) | |
| Water Inlet / Outlet Victaulic Connections, in. (mm) | 5 (127) | | 5 (127) | | 5 (127) | |
| Drain - NPT int, in. (mm) | 0.5 (12.7) | | 0.5 (12.7) | | 0.5 (12.7) | |
| Vent - NPT int, in. (mm) | 0.5 (12.7) | | 0.5 (12.7) | | 0.5 (12.7) | |

## *Table 20, ACZ 120B - 155B, AGZ 100BM – 130BM*

| PHYSICAL DATA | MODEL NUMBER | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ACZ 120B AGZ 100BM | | ACZ 130B AGZ 110BM | | ACZ 140B AGZ 120BM | | ACZ 155B AGZ 130BM | |
| **BASIC DATA** | **Ckt.1** | **Ckt.2** | **Ckt.1** | **Ckt.2** | **Ckt.1** | **Ckt.2** | **Ckt.1** | **Ckt.2** |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-22, lbs. | 72 | 82 | 82 | 82 | 82 | 99 | 99 | 99 |
| Unit Operating Charge, R-22, (kg) | 33 | 37 | 37 | 37 | 37 | 45 | 45 | 45 |
| Cabinet Dimensions, LxWxH, in. | 173.1 x 88.0 x 100.4 | | 173.1 x 88.0 x 100.4 | | 173.1 x 88.0 x 100.4 | | 173.1 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 4397 x 2235 x 2550 | | 4397 x 2235 x 2550 | | 4397 x 2235 x 2550 | | 4397 x 2235 x 2550 | |
| Unit Operating Weight, Lbs. (kg) | 6970 (3164 | | 7230 (3282) | | 7480 (3396) | | 7760 (3523) | |
| Unit Shipping Weight, Lbs. (kg) | 6820 (3096) | | 7080 (3214) | | 7360 (3341) | | 7640 (3469) | |
| Add'l. Weight If Copper Finned Coils, lbs. (kg) | 1155 (524) | | 1155 (524) | | 1155 (524) | | 1155 (524) | |
| **COMPRESSORS** | | | | | | | | |
| Type | Trio Scrolls | | Trio Scrolls | | Trio Scrolls | | Trio Scrolls | |
| Nominal tonnage of each Compressor | 15.0 | 20.0 | 20.0 | 20.0 | 20.0 | 25.0 | 25.0 | 25.0 |
| Number Of Compressors per Circuit | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Oil Charge Per Compressor, oz. | 140 | 148 | 148 | 148 | 148 | 200 | 200 | 200 |
| Oil Charge Per Compressor, (g) | (496) | (525) | (525) | (525) | (525) | (709) | (709) | (709) |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | | | |
| Staging, 6 Stages, Circuit #1 in Lead | 0-14-33-48-67-81-100 | | 0-17-33-50-67-83-100 | | 0-15-33-48-67-81-100 | | 0-17-33-50-67-83-100 | |
| Staging, 6 Stages, Circuit #2 in Lead | 0-19-33-52-67-86-100 | | 0-17-33-50-67-83-100 | | 0-19-33-52-67-86-100 | | 0-17-33-50-67-83-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | | | |
| Coil Face Area, sq. ft. | 105.3 | 105.3 | 105.3 | 105.3 | 105.3 | 105.3 | 105.3 | 105.3 |
| Coil Face Area, ($m^2$) | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 |
| Finned Height x Finned Length, in. | 50 x151.6 | 50 x151.6 | 50 x151.6 | 50 x151.6 | 50 x151.6 | 50 x151.6 | 50 x151.6 | 50 x151.6 |
| Finned Height x Finned Length, (mm) | 1270 x 3851 | 1270 x 3851 | 1270 x 3851 | 1270 x 3851 | 1270 x 3851 | 1270 x 3851 | 1270 x 3851 | 1270 x 3851 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 196 (89) | 196 (89) | 196 (89) | 196 (89) | 196 (89) | 196 (89) | 196 (89) | 196 (89) |
| Maximum Relief Valve Pressure Setting, psig (kPa) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) | 450 (3103) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 8 – 30 (762) | | 8 – 30 (762) | | 8 – 30 (762) | | 8 – 30 (762) | |
| Number Of Motors - HP (kW) | 8 – 2.0 | | 8 – 2.0 | | 8 – 2.0 | | 8 – 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (4224) | | 8950 (4224) | | 8950 (4224) | | 8950 (4224) | |
| 60 Hz Total Unit Airflow, CFM ($m^3$/sec) | 86,904 (41,020) | | 86,904 (41,020) | | 86,904 (41,020) | | 86,904 (41,020) | |
| | | | | | | | | |
| **REMOTE EVAPORATOR - SHELL AND TUBE (AGZ-BM ONLY)** | | | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | | 1, | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Diameter, in. - Length, ft. | 12.8 x 7.9 | | 12.8 x 7.9 | | 14.0 x 8.0 | | 14.0 x 8.0 | |
| Diameter, (mm) – Length, (mm) | 324 x 2408 | | 324 x 2408 | | 356 x 2438 | | 356 x 2438 | |
| Water Volume, Gallons, (L) | 34 (127) | | 34 (127) | | 40 (150) | | 40 (150) | |
| Maximum Water Pressure, psig (kPa) | 152 (1047) | | 152 (1047) | | 152 (1047) | | 152 (1047) | |
| Maximum Refrigerant Working Press., psig (kPa) | 300 (2066) | | 300 (2066) | | 300 (2066) | | 300 (2066) | |
| Water Inlet / Outlet Victaulic Conn., in. (mm) | 5 (127) | | 5 (127) | | 5 (127) | | 5 (127) | |
| Drain - NPT int., in. (mm) | 0.5 (12.7) | | 0.5 (12.7) | | 0.5 (12.7) | | 0.5 (12.7) | |
| Vent - NPT int., in. (mm) | 0.5 (12.7) | | 0.5 (12.7) | | 0.5 (12.7) | | 0.5 (12.7) | |

# Electrical Data Standard Ambient

***Table 21, ACZ BC & AGZ BM Electrical Data, Single Point (105°F & below)***

| ACZ Unit Size | AGZ Unit Size | Volts | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire | | Recomm'd. Fuse Or HACR Breaker Size | Max. Fuse Or HACR Breaker Size |
|---|---|---|---|---|---|---|---|
| | | | | Quantity | Wire Gauge 75C | | |
| | | 208 | 133 | 3 | 1/0 | 150 | 150 |
| | | 230 | 126 | 3 | #1 | 150 | 150 |
| **030B** | **026B** | 380 | 80 | 3 | #4 | 90 | 90 |
| | | 460 | 68 | 3 | #4 | 80 | 80 |
| | | 575 | 52 | 3 | #6 | 60 | 60 |
| | | 208 | 146 | 3 | 1/0 | 175 | 175 |
| | | 230 | 143 | 3 | 1/0 | 175 | 175 |
| **035B** | **030B** | 380 | 88 | 3 | #3 | 100 | 100 |
| | | 460 | 74 | 3 | #4 | 80 | 90 |
| | | 575 | 58 | 3 | #6 | 70 | 70 |
| | | 208 | 158 | 3 | 2/0 | 175 | 175 |
| | | 230 | 150 | 3 | 1/0 | 175 | 175 |
| **040B** | **035B** | 380 | 96 | 3 | #3 | 110 | 110 |
| | | 460 | 79 | 3 | #4 | 90 | 90 |
| | | 575 | 64 | 3 | #6 | 70 | 70 |
| | | 208 | 167 | 3 | 2/0 | 200 | 200 |
| | | 230 | 167 | 3 | 2/0 | 200 | 200 |
| **045B** | **040B** | 380 | 113 | 3 | #2 | 125 | 125 |
| | | 460 | 81 | 3 | #4 | 90 | 90 |
| | | 575 | 70 | 3 | #4 | 80 | 80 |
| | | 208 | 184 | 3 | 3/0 | 225 | 225 |
| | | 230 | 184 | 3 | 3/0 | 225 | 225 |
| **050B** | **045B** | 380 | 121 | 3 | #1 | 125 | 125 |
| | | 460 | 94 | 3 | #3 | 110 | 110 |
| | | 575 | 78 | 3 | #4 | 90 | 90 |
| | | 208 | 199 | 3 | 3/0 | 225 | 225 |
| | | 230 | 199 | 3 | 3/0 | 225 | 225 |
| **055B** | **050B** | 380 | 127 | 3 | #1 | 150 | 150 |
| | | 460 | 104 | 3 | #2 | 125 | 125 |
| | | 575 | 86 | 3 | #3 | 100 | 100 |
| | | 208 | 221 | 3 | 4/0 | 250 | 250 |
| | | 230 | 214 | 3 | 4/0 | 250 | 250 |
| **060B** | **055B** | 380 | 145 | 3 | 1/0 | 175 | 175 |
| | | 460 | 108 | 3 | #2 | 125 | 125 |
| | | 575 | 96 | 3 | #3 | 110 | 110 |
| | | 208 | 248 | 3 | 250 | 300 | 300 |
| | | 230 | 228 | 3 | 4/0 | 250 | 250 |
| **065B** | **060B** | 380 | 156 | 3 | 2/0 | 175 | 175 |
| | | 460 | 112 | 3 | #2 | 125 | 125 |
| | | 575 | 105 | 3 | #2 | 125 | 125 |
| | | 208 | 281 | 3 | 300 | 350 | 350 |
| | | 230 | 281 | 3 | 300 | 350 | 350 |
| **070B** | **065B** | 380 | 162 | 3 | 2/0 | 200 | 200 |
| | | 460 | 124 | 3 | #1 | 150 | 150 |
| | | 575 | 109 | 3 | #2 | 125 | 125 |
| | | 208 | 301 | 3 | 350 | 350 | 350 |
| | | 230 | 301 | 3 | 350 | 350 | 350 |
| **080B** | **070B** | 380 | 168 | 3 | 2/0 | 200 | 200 |
| | | 460 | 130 | 3 | #1 | 150 | 150 |
| | | 575 | 112 | 3 | #2 | 125 | 125 |

NOTES:

1. Units operating in ambient temperatures of 95°F (35°C) and above must use the Maximum Fuse or HACR Breaker size.
2. All Electrical Data notes are on page 49.
3. Conduit hubs are not provided.

### *Table 22, ACZ BC & AGZ BM Compressor & Fan Motor Amps, Single & Multi-Point (Up to 105°F)*

| ACZ Unit Size | AGZ Unit Size | Volts | Rated Load Amps | | | | | No. Of Fan Motors | Locked Rotor Amps | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Compressors | | | | F.L.Amps Per Fan Motor | | Fan Motors Each | Compressors Across- The- Line | | | |
| | | | No. 1 | No. 3 | No. 2 | No. 4 | | | | No.1 | No. 3 | No.2 | No.4 |
| 030B | 026B | 208 | 25.7 | 25.7 | 25.7 | 25.7 | 5.8 | 4 | 23.3 | 189 | 189 | 189 | 189 |
| | | 230 | 24.2 | 24.2 | 24.2 | 24.2 | 5.8 | 4 | 26.1 | 189 | 189 | 189 | 189 |
| | | 380 | 14.9 | 14.9 | 14.9 | 14.9 | 4.1 | 4 | 20.0 | 112 | 112 | 112 | 112 |
| | | 460 | 13.4 | 13.4 | 13.4 | 13.4 | 2.8 | 4 | 13.0 | 99 | 99 | 99 | 99 |
| | | 575 | 9.3 | 9.3 | 9.3 | 9.3 | 3.0 | 4 | 14.0 | 74 | 74 | 74 | 74 |
| 035B | 030B | 208 | 25.7 | 25.7 | 31.8 | 31.8 | 5.8 | 4 | 23.3 | 189 | 189 | 232 | 232 |
| | | 230 | 24.2 | 24.2 | 31.8 | 31.8 | 5.8 | 4 | 26.1 | 189 | 189 | 232 | 232 |
| | | 380 | 14.9 | 14.9 | 18.6 | 18.6 | 4.1 | 4 | 20.0 | 112 | 112 | 144 | 144 |
| | | 460 | 13.4 | 13.4 | 16.0 | 16.0 | 2.8 | 4 | 13.0 | 99 | 99 | 125 | 125 |
| | | 575 | 9.3 | 9.3 | 12.2 | 12.2 | 3.0 | 4 | 14.0 | 74 | 74 | 100 | 100 |
| 040B | 035B | 208 | 31.8 | 31.8 | 31.8 | 31.8 | 5.8 | 4 | 23.3 | 232 | 232 | 232 | 232 |
| | | 230 | 29.9 | 29.9 | 29.9 | 29.9 | 5.8 | 4 | 26.1 | 232 | 232 | 232 | 232 |
| | | 380 | 18.6 | 18.6 | 18.6 | 18.6 | 4.1 | 4 | 20.0 | 144 | 144 | 144 | 144 |
| | | 460 | 16.0 | 16.0 | 16.0 | 16.0 | 2.8 | 4 | 13.0 | 125 | 125 | 125 | 125 |
| | | 575 | 12.2 | 12.2 | 12.2 | 12.2 | 3.0 | 4 | 14.0 | 100 | 100 | 100 | 100 |
| 045B | 040B | 208 | 33.8 | 33.8 | 33.8 | 33.8 | 5.8 | 4 | 23.3 | 278 | 278 | 278 | 278 |
| | | 230 | 33.8 | 33.8 | 33.8 | 33.8 | 5.8 | 4 | 26.1 | 278 | 278 | 278 | 278 |
| | | 380 | 22.8 | 22.8 | 22.8 | 22.8 | 4.1 | 4 | 20.0 | 151 | 151 | 151 | 151 |
| | | 460 | 16.5 | 16.5 | 16.5 | 16.5 | 2.8 | 4 | 13.0 | 127 | 127 | 127 | 127 |
| | | 575 | 13.7 | 13.7 | 13.7 | 13.7 | 3.0 | 4 | 14.0 | 100 | 100 | 100 | 100 |
| 050B | 045B | 208 | 33.8 | 33.8 | 41.4 | 41.4 | 5.8 | 4 | 23.3 | 278 | 278 | 350 | 350 |
| | | 230 | 33.8 | 33.8 | 41.4 | 41.4 | 5.8 | 4 | 26.1 | 278 | 278 | 350 | 350 |
| | | 380 | 22.8 | 22.8 | 26.0 | 26.0 | 4.1 | 4 | 20.0 | 151 | 151 | 195 | 195 |
| | | 460 | 16.5 | 16.5 | 21.8 | 21.8 | 2.8 | 4 | 13.0 | 127 | 127 | 158 | 158 |
| | | 575 | 13.7 | 13.7 | 17.3 | 17.3 | 3.0 | 4 | 14.0 | 100 | 100 | 125 | 125 |
| 055B | 050B | 208 | 41.4 | 41.4 | 41.4 | 41.4 | 5.8 | 4 | 23.3 | 350 | 350 | 350 | 350 |
| | | 230 | 41.4 | 41.4 | 41.4 | 41.4 | 5.8 | 4 | 26.1 | 350 | 350 | 350 | 350 |
| | | 380 | 26.0 | 26.0 | 26.0 | 26.0 | 4.1 | 4 | 20.0 | 195 | 195 | 195 | 195 |
| | | 460 | 21.8 | 21.8 | 21.8 | 21.8 | 2.8 | 4 | 13.0 | 158 | 158 | 158 | 158 |
| | | 575 | 17.3 | 17.3 | 17.3 | 17.3 | 3.0 | 4 | 14.0 | 125 | 125 | 125 | 125 |
| 060B | 055B | 208 | 41.0 | 41.0 | 51.3 | 51.3 | 5.8 | 4 | 23.3 | 350 | 350 | 425 | 425 |
| | | 230 | 41.0 | 41.0 | 48.1 | 48.1 | 5.8 | 4 | 26.1 | 350 | 350 | 425 | 425 |
| | | 380 | 26.0 | 26.0 | 33.8 | 33.8 | 4.1 | 4 | 20.0 | 195 | 195 | 239 | 239 |
| | | 460 | 21.8 | 21.8 | 23.7 | 23.7 | 2.8 | 4 | 13.0 | 158 | 158 | 187 | 187 |
| | | 575 | 17.3 | 17.3 | 21.8 | 21.8 | 3.0 | 4 | 14.0 | 125 | 125 | 148 | 148 |
| 065B | 060B | 208 | 52.8 | 52.8 | 52.8 | 52.8 | 5.8 | 4 | 23.3 | 425 | 425 | 425 | 425 |
| | | 230 | 48.1 | 48.1 | 48.1 | 48.1 | 5.8 | 4 | 26.1 | 425 | 425 | 425 | 425 |
| | | 380 | 32.7 | 32.7 | 32.7 | 32.7 | 4.1 | 4 | 20.0 | 239 | 239 | 239 | 239 |
| | | 460 | 23.7 | 23.7 | 23.7 | 23.7 | 2.8 | 4 | 13.0 | 187 | 187 | 187 | 187 |
| | | 575 | 21.8 | 21.8 | 21.8 | 21.8 | 3.0 | 4 | 14.0 | 148 | 148 | 148 | 148 |
| 070B | 065B | 208 | 52.8 | 52.8 | 52.8 | 73.1 | 7.8 | 4 | 31.7 | 425 | 425 | 425 | 505 |
| | | 230 | 52.8 | 52.8 | 52.8 | 73.1 | 7.8 | 4 | 35.6 | 425 | 425 | 425 | 505 |
| | | 380 | 32.7 | 32.7 | 32.7 | 38.2 | 4.1 | 4 | 20.0 | 239 | 239 | 239 | 280 |
| | | 460 | 23.7 | 23.7 | 23.7 | 30.1 | 3.6 | 4 | 17.8 | 187 | 187 | 187 | 225 |
| | | 575 | 21.8 | 21.8 | 21.8 | 25.2 | 3.0 | 4 | 14.0 | 148 | 148 | 148 | 180 |
| 080B | 070B | 208 | 52.8 | 73.1 | 52.8 | 73.1 | 7.8 | 4 | 31.7 | 425 | 505 | 425 | 505 |
| | | 230 | 52.8 | 73.1 | 52.8 | 73.1 | 7.8 | 4 | 35.6 | 425 | 505 | 425 | 505 |
| | | 380 | 32.7 | 38.2 | 32.7 | 38.2 | 4.1 | 4 | 20.0 | 239 | 280 | 239 | 280 |
| | | 460 | 23.7 | 30.1 | 23.7 | 30.1 | 3.6 | 4 | 17.8 | 187 | 225 | 187 | 225 |
| | | 575 | 21.8 | 25.2 | 21.8 | 25.2 | 3.0 | 4 | 14.0 | 148 | 180 | 148 | 180 |

All Electrical Data notes are on page 49

### *Table 23, ACZ BC & AGZ BM Field Wiring, Single Point*

| ACZ Unit Size | AGZ Unit Size | Volts | Wiring to Standard Power Block | | Wiring to Optional Non-Fused Disconnect Switch | |
|---|---|---|---|---|---|---|
| | | | Terminal Amps | Connector Wire Range (Copper Wire Only) | Disconnect Size | Connector Wire Range (Copper Wire Only) |
| **030B** | **026B** | 208 | 175 | 14 GA – 2/0 | 225 | # 4 - 300 kcmil |
| | | 230 | 175 | 14 GA – 2/0 | 225 | # 4 - 300 kcmil |
| | | 380 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 460 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 575 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| **035B** | **030B** | 208 | 380 | #4 – 500 kcmil | 225 | # 4 - 300 kcmil |
| | | 230 | 380 | #4 – 500 kcmil | 225 | # 4 - 300 kcmil |
| | | 380 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 460 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 575 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| **040B** | **035B** | 208 | 380 | #4 – 500 kcmil | 225 | # 4 - 300 kcmil |
| | | 230 | 380 | #4 – 500 kcmil | 225 | # 4 - 300 kcmil |
| | | 380 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 460 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 575 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| **045B** | **040B** | 208 | 380 | #4 – 500 kcmil | 225 | # 4 - 300 kcmil |
| | | 230 | 380 | #4 – 500 kcmil | 225 | # 4 - 300 kcmil |
| | | 380 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 460 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 575 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| **050B** | **045B** | 208 | 380 | #4 – 500 kcmil | 225 | # 4 - 300 kcmil |
| | | 230 | 380 | #4 – 500 kcmil | 225 | # 4 - 300 kcmil |
| | | 380 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 460 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 575 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| **055B** | **050B** | 208 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| | | 230 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| | | 380 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 460 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 575 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| **060B** | **055B** | 208 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 230 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 380 | 175 | 14 GA – 2/0 | 250 | #6 - 350 kcmil |
| | | 460 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 575 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| **065B** | **060B** | 208 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 230 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 380 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| | | 460 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| | | 575 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| **070B** | **065B** | 208 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 230 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 380 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| | | 460 | 175 | 14 GA – 2/0 | 250 | # 4 - 300 kcmil |
| | | 575 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |
| **080B** | **070B** | 208 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 230 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 380 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| | | 460 | 380 | #4 – 500 kcmil | 250 | # 4 - 300 kcmil |
| | | 575 | 175 | 14 GA – 2/0 | 150 | # 4 - 300 kcmil |

All Electrical Data notes are on page 49.

## *Table 24, ACZ BC & AGZ BM Electrical Wiring, Single Point (Up to 105°F)*

| ACZ Unit Size | AGZ Unit Size | Volts | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire | | Recomm'd. Fuse Or HACR Breaker Size | Max. Fuse Or HACR Breaker Size |
|---|---|---|---|---|---|---|---|
| | | | | Quantity | Wire Gauge 75C | | |
| | | 208 | 358 | 6 | 4/0 | 400 | 400 |
| | | 230 | 358 | 6 | 4/0 | 400 | 400 |
| **090B** | **075B** | 380 | 187 | 3 | 3/0 | 225 | 225 |
| | | 460 | 150 | 3 | 1/0 | 175 | 175 |
| | | 575 | 125 | 3 | #1 | 150 | 150 |
| | | 208 | 380 | 6 | 250 | 450 | 450 |
| | | 230 | 380 | 6 | 250 | 450 | 450 |
| **100B** | **085B** | 380 | 219 | 3 | 250 | 250 | 250 |
| | | 460 | 171 | 3 | 2/0 | 200 | 200 |
| | | 575 | 136 | 3 | 1/0 | 150 | 150 |
| | | 208 | 414 | 6 | 300 | 500 | 500 |
| | | 230 | 414 | 6 | 300 | 500 | 500 |
| **110B** | **090B** | 380 | 248 | 3 | 250 | 300 | 300 |
| | | 460 | 188 | 3 | 3/0 | 225 | 225 |
| | | 575 | 146 | 3 | 1/0 | 175 | 175 |
| | | 208 | 463 | 6 | 350 | 500 | 500 |
| | | 230 | 463 | 6 | 300 | 500 | 500 |
| **120B** | **100B** | 380 | 260 | 3 | 300 | 300 | 300 |
| | | 460 | 199 | 3 | 3/0 | 225 | 225 |
| | | 575 | 171 | 3 | 2/0 | 175 | 175 |
| | | 208 | 528 | 6 - (2) | 300 | 600 | 600 |
| | | 230 | 528 | 6 - (2) | 300 | 600 | 600 |
| **130B** | **110B** | 380 | 282 | 3 | 300 | 300 | 300 |
| | | 460 | 220 | 3 | 4/0 | 250 | 250 |
| | | 575 | 182 | 3 | 3/0 | 200 | 200 |
| | | 208 | 613 | 6 - (2) | 350 | 700 | 700 |
| | | 230 | 613 | 6 - (2) | 350 | 700 | 700 |
| **140B** | **120B** | 380 | 323 | 3 | 400 | 350 | 350 |
| | | 460 | 248 | 3 | 250 | 250 | 250 |
| | | 575 | 198 | 3 | 3/0 | 225 | 225 |
| | | 208 | 613 | 6 - (2) | 350 | 700 | 700 |
| | | 230 | 613 | 6 - (2) | 350 | 700 | 700 |
| **155B** | **130B** | 380 | 361 | 6 | 4/0 | 400 | 400 |
| | | 460 | 273 | 3 | 300 | 300 | 300 |
| | | 575 | 212 | 3 | 4/0 | 225 | 225 |

NOTES:

1. Units operating in ambient temperatures of 95°F (35°C) and above must use the Maximum Fuse or HACR Breaker size.
2. All Electrical Data notes are on page 49.
3. (2) indicates that two conduits are required.
4. Conduit hubs are not supplied.

### *Table 25, ACZ BC & AGZ BM Compressor and Fan Motor Amps, Single and Multi-Point (Up to 105°F)*

| ACZ Unit Size | AGZ Unit Size | Volts | Rated Load Amps | | | | | | | No. Of Fan Motors | Locked Rotor Amps | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Compressors | | | | | | F.L. Amps Fan Motors (Each) | | Fan Motors (Each) | Compressors Across-The-Line | | | | | |
| | | | No. 1 | No. 3 | No. 5 | No. 2 | No. 4 | No. 6 | | | | No.1 | No. 3 | No. 5 | No.2 | No.4 | No. 6 |
| 090B | 075B | 208 | 73.1 | 73.1 | - | 73.1 | 73.1 | - | 7.8 | 6 | 31.7 | 505 | 505 | - | 505 | 505 | - |
| | | 230 | 73.1 | 73.1 | - | 73.1 | 73.1 | - | 7.8 | 6 | 35.6 | 505 | 505 | - | 505 | 505 | - |
| | | 380 | 38.2 | 38.2 | - | 38.2 | 38.2 | - | 4.1 | 6 | 20.0 | 280 | 280 | - | 280 | 280 | - |
| | | 460 | 30.1 | 30.1 | - | 30.1 | 30.1 | - | 3.6 | 6 | 17.8 | 225 | 225 | - | 225 | 225 | - |
| | | 575 | 25.2 | 25.2 | - | 25.2 | 25.2 | - | 3.0 | 6 | 14.0 | 180 | 180 | - | 180 | 180 | - |
| 100B | 085B | 208 | 73.1 | 73.1 | - | 83.3 | 83.3 | - | 7.8 | 6 | 31.7 | 505 | 505 | - | 500 | 500 | - |
| | | 230 | 73.1 | 73.1 | - | 83.3 | 83.3 | - | 7.8 | 6 | 35.6 | 505 | 505 | - | 500 | 500 | - |
| | | 380 | 38.2 | 38.2 | - | 52.5 | 52.5 | - | 4.1 | 6 | 20.0 | 280 | 280 | - | 305 | 305 | - |
| | | 460 | 30.1 | 30.1 | - | 39.0 | 39.0 | - | 3.6 | 6 | 17.8 | 225 | 225 | - | 250 | 250 | - |
| | | 575 | 25.2 | 25.2 | - | 30.0 | 30.0 | - | 3.0 | 6 | 14.0 | 180 | 180 | - | 198 | 198 | - |
| 110B | 090B | 208 | 86.4 | 86.4 | - | 86.4 | 86.4 | - | 7.8 | 6 | 31.7 | 500 | 500 | - | 500 | 500 | - |
| | | 230 | 86.4 | 86.4 | - | 86.4 | 86.4 | - | 7.8 | 6 | 35.6 | 500 | 500 | - | 500 | 500 | - |
| | | 380 | 52.5 | 52.5 | - | 52.5 | 52.5 | - | 4.1 | 6 | 20.0 | 305 | 305 | - | 305 | 305 | - |
| | | 460 | 39.0 | 39.0 | - | 39.0 | 39.0 | - | 3.6 | 6 | 17.8 | 250 | 250 | - | 250 | 250 | - |
| | | 575 | 30.0 | 30.0 | - | 30.0 | 30.0 | - | 3.0 | 6 | 14.0 | 198 | 198 | - | 198 | 198 | - |
| 120B | 100B | 208 | 52.8 | 52.8 | 52.8 | 74.5 | 74.5 | 74.5 | 7.8 | 8 | 31.7 | 425 | 425 | 425 | 505 | 505 | 505 |
| | | 230 | 52.8 | 52.8 | 52.8 | 74.5 | 74.5 | 74.5 | 7.8 | 8 | 35.6 | 425 | 425 | 425 | 505 | 505 | 505 |
| | | 380 | 32.7 | 32.7 | 32.7 | 39.8 | 39.8 | 39.8 | 4.1 | 8 | 20.0 | 239 | 239 | 239 | 280 | 280 | 280 |
| | | 460 | 23.7 | 23.7 | 23.7 | 30.6 | 30.6 | 30.6 | 3.6 | 8 | 17.8 | 187 | 187 | 187 | 225 | 225 | 225 |
| | | 575 | 21.8 | 21.8 | 21.8 | 25.2 | 25.2 | 25.2 | 3.0 | 8 | 14.0 | 148 | 148 | 148 | 180 | 180 | 180 |
| 130B | 110B | 208 | 74.5 | 74.5 | 74.5 | 74.5 | 74.5 | 74.5 | 7.8 | 8 | 31.7 | 505 | 505 | 505 | 505 | 505 | 505 |
| | | 230 | 74.5 | 74.5 | 74.5 | 74.5 | 74.5 | 74.5 | 7.8 | 8 | 35.6 | 505 | 505 | 505 | 505 | 505 | 505 |
| | | 380 | 39.8 | 39.8 | 39.8 | 39.8 | 39.8 | 39.8 | 4.1 | 8 | 20.0 | 280 | 280 | 280 | 280 | 280 | 280 |
| | | 460 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 | 3.6 | 8 | 17.8 | 225 | 225 | 225 | 225 | 225 | 225 |
| | | 575 | 25.2 | 25.2 | 25.2 | 25.2 | 25.2 | 25.2 | 3.0 | 8 | 14.0 | 180 | 180 | 180 | 180 | 180 | 180 |
| 140B | 120B | 208 | 87.9 | 87.9 | 87.9 | 88.0 | 88.0 | 88.0 | 7.8 | 8 | 31.7 | 505 | 505 | 505 | 500 | 500 | 500 |
| | | 230 | 87.9 | 87.9 | 87.9 | 88.0 | 88.0 | 88.0 | 7.8 | 8 | 35.6 | 505 | 505 | 505 | 500 | 500 | 500 |
| | | 380 | 39.8 | 39.8 | 39.8 | 52.5 | 52.5 | 52.5 | 4.1 | 8 | 20.0 | 280 | 280 | 280 | 305 | 305 | 305 |
| | | 460 | 30.6 | 30.6 | 30.6 | 39.0 | 39.0 | 39.0 | 3.6 | 8 | 17.8 | 225 | 225 | 225 | 250 | 250 | 250 |
| | | 575 | 25.2 | 25.2 | 25.2 | 30.0 | 30.0 | 30.0 | 3.0 | 8 | 14.0 | 180 | 180 | 180 | 198 | 198 | 198 |
| 155B | 130B | 208 | 88.0 | 88.0 | 88.0 | 88.0 | 88.0 | 88.0 | 7.8 | 8 | 31.7 | 500 | 500 | 500 | 500 | 500 | 500 |
| | | 230 | 88.0 | 88.0 | 88.0 | 88.0 | 88.0 | 88.0 | 7.8 | 8 | 35.6 | 500 | 500 | 500 | 500 | 500 | 500 |
| | | 380 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 | 4.1 | 8 | 20.0 | 305 | 305 | 305 | 305 | 305 | 305 |
| | | 460 | 39.0 | 39.0 | 39.0 | 39.0 | 39.0 | 39.0 | 3.6 | 8 | 17.8 | 250 | 250 | 250 | 250 | 250 | 250 |
| | | 575 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 3.0 | 8 | 14.0 | 198 | 198 | 198 | 198 | 198 | 198 |

All Electrical Data notes are on page 49

### *Table 26, ACZ BC & AGZ BM Field Wiring, Single Point*

| ACZ Unit Size | AGZ Unit Size | Volts | Wiring to Standard Power Block | | Wiring to Optional Non-Fused Disconnect Switch | |
|---|---|---|---|---|---|---|
| | | | Terminal Amps | Connector Wire Range (Copper Wire Only) | Disconnect Size | Connector Wire Range (Copper Wire Only) |
| **090B** | **075B** | 208 | 760 | 2 GA – 500 kcmil | 600 | (2) 250 kcmil -500 kcmil |
| | | 230 | 760 | 2 GA – 500 kcmil | 600 | (2) 250 kcmil -500 kcmil |
| | | 380 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| | | 460 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| | | 575 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| **100B** | **085B** | 208 | 760 | 2 GA – 500 kcmil | 600 | (2) 250 kcmil -500 kcmil |
| | | 230 | 760 | 2 GA – 500 kcmil | 600 | (2) 250 kcmil -500 kcmil |
| | | 380 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 460 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| | | 575 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| **110B** | **090B** | 208 | 760 | 2 GA – 500 kcmil | 600 | (2) 250 kcmil -500 kcmil |
| | | 230 | 760 | 2 GA – 500 kcmil | 600 | (2) 250 kcmil -500 kcmil |
| | | 380 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 460 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| | | 575 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| **120B** | **100B** | 208 | 760 | 2 GA – 500 kcmil | 600 | (2) 250 kcmil -500 kcmil |
| | | 230 | 760 | 2 GA – 500 kcmil | 600 | (2) 250 kcmil -500 kcmil |
| | | 380 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 460 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 575 | 380 | #4 – 500 kcmil | 250 | #6 - 350 kcmil |
| **130B** | **110B** | 208 | 760 | 2 GA – 500 kcmil | 800 | (2) 250 kcmil -500 kcmil |
| | | 230 | 760 | 2 GA – 500 kcmil | 800 | (2) 250 kcmil -500 kcmil |
| | | 380 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 460 | 380 | #4 – 500 kcmil | 400 | (2) 3/0-250 kcmil |
| | | 575 | 380 | #4 – 500 kcmil | 400 | (2) 3/0-250 kcmil |
| **140B** | **120B** | 208 | 760 | 2 GA – 500 kcmil | 800 | (2) 250 kcmil -500 kcmil |
| | | 230 | 760 | 2 GA – 500 kcmil | 800 | (2) 250 kcmil -500 kcmil |
| | | 380 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 460 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 575 | 380 | #4 – 500 kcmil | 400 | (2) 3/0-250 kcmil |
| **155B** | **130B** | 208 | 760 | 2 GA – 500 kcmil | 800 | (2) 250 kcmil -500 kcmil |
| | | 230 | 760 | 2 GA – 500 kcmil | 800 | (2) 250 kcmil -500 kcmil |
| | | 380 | 760 | 2 GA – 500 kcmil | 600 | (2) 3/0-250 kcmil |
| | | 460 | 380 | #4 – 500 kcmil | 400 | 250 kcmil -500 kcmil |
| | | 575 | 380 | #4 – 500 kcmil | 400 | (2) 3/0-250 kcmil |

All Electrical Data notes are on page 49.

## *Table 27, ACZ BC & AGZ BM Electrical Data, Multi-Point (Up to 105°F)*

| ACZ Unit Size | AGZ Unit Size | Volts | Electrical Circuit #1 | | | | | Electrical Circuit #2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire | | Recomm'd Fuse or HACR Breaker Size | Max. Fuse or HACR Breaker Size | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire | | Recomm'd Fuse or HACR Breaker Size | Max. Fuse or HACR Breaker Size |
| | | | | Qty | Wire Gauge | | | | Qty | Wire Gauge | | |
| **030B** | **026B** | 208 | 70 | 3 | #4 | 80 | 90 | 70 | 3 | #4 | 80 | 90 |
| | | 230 | 66 | 3 | #4 | 80 | 90 | 66 | 3 | #4 | 80 | 90 |
| | | 380 | 42 | 3 | #8 | 50 | 50 | 42 | 3 | #8 | 50 | 50 |
| | | 460 | 36 | 3 | #8 | 45 | 45 | 36 | 3 | #8 | 45 | 45 |
| | | 575 | 27 | 3 | #10 | 35 | 35 | 27 | 3 | #10 | 35 | 35 |
| **035B** | **030B** | 208 | 70 | 3 | #4 | 80 | 90 | 83 | 3 | #4 | 100 | 110 |
| | | 230 | 66 | 3 | #4 | 80 | 90 | 83 | 3 | #4 | 100 | 100 |
| | | 380 | 42 | 3 | #8 | 50 | 50 | 50 | 3 | #8 | 60 | 60 |
| | | 460 | 36 | 3 | #8 | 45 | 45 | 42 | 3 | #8 | 50 | 50 |
| | | 575 | 27 | 3 | #10 | 35 | 35 | 34 | 3 | #10 | 40 | 45 |
| **040B** | **035B** | 208 | 83 | 3 | #4 | 100 | 110 | 83 | 3 | #4 | 100 | 110 |
| | | 230 | 79 | 3 | #4 | 100 | 100 | 79 | 3 | #4 | 100 | 100 |
| | | 380 | 50 | 3 | #8 | 60 | 60 | 50 | 3 | #8 | 60 | 60 |
| | | 460 | 42 | 3 | #8 | 50 | 50 | 42 | 3 | #8 | 50 | 50 |
| | | 575 | 34 | 3 | #10 | 40 | 45 | 34 | 3 | #10 | 40 | 45 |
| **045B** | **040B** | 208 | 88 | 3 | #3 | 110 | 110 | 88 | 3 | #3 | 110 | 110 |
| | | 230 | 88 | 3 | #3 | 110 | 100 | 88 | 3 | #3 | 110 | 100 |
| | | 380 | 60 | 3 | #6 | 70 | 80 | 60 | 3 | #6 | 70 | 80 |
| | | 460 | 43 | 3 | #8 | 50 | 50 | 43 | 3 | #8 | 50 | 50 |
| | | 575 | 37 | 3 | #8 | 45 | 50 | 37 | 3 | #8 | 45 | 50 |
| **050B** | **045B** | 208 | 88 | 3 | #3 | 110 | 110 | 105 | 3 | #2 | 125 | 125 |
| | | 230 | 88 | 3 | #3 | 110 | 110 | 105 | 3 | #2 | 125 | 125 |
| | | 380 | 60 | 3 | #6 | 70 | 80 | 67 | 3 | #4 | 80 | 80 |
| | | 460 | 43 | 3 | #8 | 50 | 50 | 55 | 3 | #6 | 70 | 70 |
| | | 575 | 37 | 3 | #8 | 45 | 50 | 45 | 3 | #8 | 50 | 60 |
| **055B** | **050B** | 208 | 105 | 3 | #2 | 125 | 125 | 105 | 3 | #2 | 125 | 125 |
| | | 230 | 105 | 3 | #2 | 125 | 125 | 105 | 3 | #2 | 125 | 125 |
| | | 380 | 67 | 3 | #4 | 80 | 80 | 67 | 3 | #4 | 80 | 80 |
| | | 460 | 55 | 3 | #6 | 70 | 70 | 55 | 3 | #6 | 70 | 70 |
| | | 575 | 45 | 3 | #8 | 50 | 60 | 45 | 3 | #8 | 50 | 60 |
| **060B** | **055B** | 208 | 105 | 3 | #2 | 125 | 125 | 130 | 3 | #1 | 150 | 175 |
| | | 230 | 105 | 3 | #2 | 125 | 125 | 120 | 3 | #1 | 150 | 150 |
| | | 380 | 67 | 3 | #4 | 80 | 80 | 82 | 3 | #3 | 100 | 110 |
| | | 460 | 55 | 3 | #6 | 70 | 70 | 59 | 3 | #6 | 70 | 80 |
| | | 575 | 45 | 3 | #8 | 50 | 60 | 55 | 3 | #6 | 70 | 70 |
| **065B** | **060B** | 208 | 130 | 3 | #1 | 150 | 175 | 130 | 3 | #1 | 150 | 175 |
| | | 230 | 120 | 3 | #1 | 150 | 150 | 120 | 3 | #1 | 150 | 150 |
| | | 380 | 82 | 3 | #3 | 100 | 110 | 82 | 3 | #3 | 100 | 110 |
| | | 460 | 59 | 3 | #6 | 70 | 80 | 59 | 3 | #6 | 70 | 80 |
| | | 575 | 55 | 3 | #6 | 70 | 70 | 55 | 3 | #6 | 70 | 70 |
| **070B** | **065B** | 208 | 135 | 3 | 1/0 | 175 | 175 | 160 | 3 | 2/0 | 200 | 225 |
| | | 230 | 135 | 3 | 1/0 | 175 | 175 | 160 | 3 | 2/0 | 200 | 225 |
| | | 380 | 82 | 3 | #4 | 100 | 110 | 89 | 3 | #3 | 110 | 125 |
| | | 460 | 61 | 3 | #6 | 70 | 80 | 69 | 3 | #4 | 90 | 100 |
| | | 575 | 55 | 3 | #6 | 70 | 70 | 59 | 3 | #6 | 70 | 80 |
| **080B** | **070B** | 208 | 160 | 3 | 2/0 | 200 | 225 | 160 | 3 | 2/0 | 200 | 225 |
| | | 230 | 160 | 3 | 2/0 | 200 | 225 | 160 | 3 | 2/0 | 200 | 225 |
| | | 380 | 89 | 3 | #3 | 110 | 125 | 89 | 3 | #3 | 110 | 125 |
| | | 460 | 69 | 3 | #4 | 90 | 100 | 69 | 3 | #4 | 90 | 100 |
| | | 575 | 59 | 3 | #6 | 70 | 80 | 59 | 3 | #6 | 70 | 80 |

NOTES:
1. All Electrical Data notes are on page 49.
2. Conduit hubs are not supplied.

## *Table 28, ACZ BC & AGZ BM Field Wiring, Multi-Point*

| ACZ Unit Size | AGZ Unit Size | Volts | Wiring to Standard Power Block | | | | Wiring to Optional Non-Fused Disconnect Switch | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Terminal Amps | | Connector Wire Range (Copper Wire Only) | | Disconnect Size | | Connector Wire Range (Copper Wire Only) | |
| | | | Cir #1 | Cir #2 | Cir #1 | Cir #2 | Cir #1 | Cir #2 | Cir #1 | Cir #2 |
| | | 208 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 230 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **030B** | **026B** | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 208 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 230 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **035B** | **030B** | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 208 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 230 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **040B** | **035B** | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 208 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 230 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **045B** | **040B** | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 208 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 230 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **050B** | **045B** | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 208 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 230 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **055B** | **050B** | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 208 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 230 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **060B** | **055B** | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 208 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 230 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **065B** | **060B** | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 208 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 225 | 225 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 230 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 225 | 225 | #4 – 300 kcmil | #4 – 300 kcmil |
| **070B** | **065B** | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 208 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 225 | 225 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 230 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 225 | 225 | #4 – 300 kcmil | #4 – 300 kcmil |
| **080B** | **070B** | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |

All Electrical Data notes are on page 49.

## *Table 29, ACZ BC & AGZ BM Field Wiring Data*

| ACZ Unit Size | AGZ Unit Size | Volts | Wiring to Standard Power Block | | | | Wiring to Optional Non-Fused Disconnect Switch | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Terminal Amps | | Connector Wire Range (Copper Wire Only) | | Disconnect Size | | Connector Wire Range (Copper Wire Only) | |
| | | | Cir #1 | Cir #2 | Cir #1 | Cir #2 | Cir #1 | Cir #2 | Cir #1 | Cir #2 |
| **090B** | **075B** | 208 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 230 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **100B** | **085B** | 208 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 230 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **110B** | **090B** | 208 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 230 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **120B** | **100B** | 208 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 400 | #4 – 300 kcmil | 250 – 500 kcmil |
| | | 230 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 400 | #4 – 300 kcmil | 250 - 500 kcmil |
| | | 380 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 250 | #14 - 1/0 | #4 – 300 kcmil |
| | | 460 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 250 | #14 - 1/0 | #4 – 300 kcmil |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **130B** | **110B** | 208 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 400 | 400 | 250 – 500 | 250 – 500 kcmil |
| | | 230 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 400 | 400 | 250 – 500 | 250 - 500kcmil |
| | | 380 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 - 300kcmil |
| | | 460 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 - 300kcmil |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **140B** | **120B** | 208 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 400 | 400 | 250 – 500 | 250 - 500 kcmil |
| | | 230 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 400 | 400 | 250 – 500 | 250 – 500 kcmil |
| | | 380 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 460 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |
| **155B** | **130B** | 208 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 400 | 400 | 250 – 500 | 250 – 500 kcmil |
| | | 230 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 400 | 400 | 250 – 500 | 250 – 500 kcmil |
| | | 380 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 460 | 380 | 380 | #4 – 500 kcmil | #4 – 500 kcmil | 250 | 250 | #4 – 300 kcmil | #4 – 300 kcmil |
| | | 575 | 175 | 175 | 14 GA – 2/0 | 14 GA – 2/0 | 150 | 150 | #14 - 1/0 | #14 - 1/0 |

All Electrical Data notes are on page 49.

## *Table 30, ACZ BC & AGZ BM Electrical Data, Multi-Point (Up to 105°F)*

| ACZ Unit Size | AGZ Unit Size | Volts | Electrical Circuit #1 | | | | | Electrical Circuit #2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire Qty | Power Supply Field Wire Wire Gauge 75C | Recomm'd Fuse or HACR Breaker Size | Max. Fuse or HACR Breaker Size | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire Qty | Power Supply Field Wire Wire Gauge 75C | Recomm'd Fuse or HACR Breaker Size | Max. Fuse or HACR Breaker Size |
| | | 208 | 188 | 3 | 3/0 | 225 | 250 | 188 | 3 | 3/0 | 225 | 250 |
| | | 230 | 188 | 3 | 3/0 | 225 | 250 | 188 | 3 | 3/0 | 225 | 250 |
| **090B** | **075B** | 380 | 98 | 3 | #3 | 110 | 125 | 98 | 3 | #3 | 110 | 125 |
| | | 460 | 79 | 3 | #4 | 90 | 110 | 79 | 3 | #4 | 90 | 110 |
| | | 575 | 66 | 3 | #4 | 80 | 90 | 66 | 3 | #4 | 80 | 90 |
| | | 208 | 188 | 3 | 3/0 | 225 | 250 | 218 | 3 | 4/0 | 250 | 300 |
| | | 230 | 188 | 3 | 3/0 | 225 | 250 | 218 | 3 | 4/0 | 250 | 250 |
| **100B** | **085B** | 380 | 98 | 3 | #3 | 110 | 125 | 130 | 3 | #1 | 150 | 175 |
| | | 460 | 79 | 3 | #4 | 90 | 110 | 99 | 3 | #3 | 125 | 125 |
| | | 575 | 66 | 3 | #4 | 80 | 90 | 77 | 3 | #4 | 90 | 100 |
| | | 208 | 218 | 3 | 4/0 | 250 | 300 | 218 | 3 | 4/0 | 250 | 300 |
| | | 230 | 218 | 3 | 4/0 | 250 | 250 | 218 | 3 | 4/0 | 250 | 250 |
| **110B** | **090B** | 380 | 130 | 3 | #1 | 150 | 175 | 130 | 3 | #1 | 150 | 175 |
| | | 460 | 99 | 3 | #3 | 125 | 125 | 99 | 3 | #3 | 125 | 125 |
| | | 575 | 77 | 3 | #4 | 90 | 100 | 77 | 3 | #4 | 90 | 100 |
| | | 208 | 203 | 3 | 4/0 | 250 | 250 | 273 | 3 | 300 | 300 | 300 |
| | | 230 | 203 | 3 | 3/0 | 225 | 225 | 273 | 3 | 300 | 300 | 300 |
| **120B** | **100B** | 380 | 123 | 3 | #1 | 150 | 150 | 146 | 3 | 1/0 | 175 | 200 |
| | | 460 | 92 | 3 | #3 | 110 | 110 | 114 | 3 | #1 | 150 | 175 |
| | | 575 | 83 | 3 | #4 | 100 | 100 | 94 | 3 | #3 | 110 | 125 |
| | | 208 | 273 | 3 | 300 | 300 | 300 | 273 | 3 | 300 | 300 | 300 |
| | | 230 | 273 | 3 | 300 | 300 | 300 | 273 | 3 | 300 | 300 | 300 |
| **130B** | **110B** | 380 | 146 | 3 | 1/0 | 175 | 175 | 146 | 3 | 1/0 | 175 | 175 |
| | | 460 | 114 | 3 | #1 | 125 | 125 | 114 | 3 | #1 | 125 | 125 |
| | | 575 | 94 | 3 | #3 | 110 | 110 | 94 | 3 | #3 | 110 | 110 |
| | | 208 | 317 | 3 | 300 | 400 | 400 | 317 | 3 | 400 | 400 | 400 |
| | | 230 | 317 | 3 | 300 | 400 | 400 | 318 | 3 | 400 | 400 | 400 |
| **140B** | **120B** | 380 | 146 | 3 | 1/0 | 175 | 175 | 187 | 3 | 2/0 | 225 | 225 |
| | | 460 | 114 | 3 | #1 | 125 | 125 | 141 | 3 | 1/0 | 175 | 175 |
| | | 575 | 94 | 3 | #3 | 110 | 110 | 110 | 3 | #2 | 125 | 125 |
| | | 208 | 317 | 3 | 400 | 400 | 400 | 317 | 3 | 400 | 400 | 400 |
| | | 230 | 318 | 3 | 400 | 400 | 400 | 318 | 3 | 400 | 400 | 400 |
| **155B** | **130B** | 380 | 187 | 3 | 2/0 | 225 | 225 | 187 | 3 | 2/0 | 225 | 225 |
| | | 460 | 141 | 3 | 1/0 | 175 | 175 | 141 | 3 | 1/0 | 175 | 175 |
| | | 575 | 110 | 3 | #2 | 125 | 125 | 110 | 3 | #2 | 125 | 125 |

NOTES:
1. All Electrical Data notes are on page 49.
2. Conduit hubs are not supplied.

# Electrical Data High Ambient

***Table 31, ACZ BC & AGZ BM Electrical Data, Single Point***

| ACZ Unit Size | AGZ Unit Size | Volts | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire | | Recomm'd. Fuse Or HACR Breaker Size | Max. Fuse Or HACR Breaker Size |
|---|---|---|---|---|---|---|---|
| | | | | Quantity | Wire Gauge 75C | | |
| | | 208 | 147 | 3 | 1/0 | 175 | 175 |
| | | 230 | 133 | 3 | 1/0 | 150 | 150 |
| **030B** | **026B** | 380 | 80 | 3 | #4 | 90 | 90 |
| | | 460 | 68 | 3 | #4 | 80 | 80 |
| | | 575 | 53 | 3 | #6 | 60 | 60 |
| | | 208 | 158 | 3 | 2/0 | 175 | 175 |
| | | 230 | 144 | 3 | 1/0 | 175 | 175 |
| **035B** | **030B** | 380 | 88 | 3 | #3 | 100 | 100 |
| | | 460 | 74 | 3 | #4 | 90 | 90 |
| | | 575 | 59 | 3 | #6 | 70 | 70 |
| | | 208 | 168 | 3 | 2/0 | 200 | 200 |
| | | 230 | 155 | 3 | 2/0 | 175 | 175 |
| **040B** | **035B** | 380 | 96 | 3 | #3 | 110 | 110 |
| | | 460 | 80 | 3 | #4 | 90 | 90 |
| | | 575 | 64 | 3 | #6 | 70 | 70 |
| | | 208 | 187 | 3 | 3/0 | 200 | 200 |
| | | 230 | 167 | 3 | 2/0 | 200 | 200 |
| **045B** | **040B** | 380 | 113 | 3 | #2 | 125 | 125 |
| | | 460 | 84 | 3 | #4 | 90 | 90 |
| | | 575 | 70 | 3 | #4 | 80 | 80 |
| | | 208 | 207 | 3 | 4/0 | 225 | 225 |
| | | 230 | 188 | 3 | 3/0 | 225 | 225 |
| **050B** | **045B** | 380 | 123 | 3 | #1 | 125 | 125 |
| | | 460 | 94 | 3 | #3 | 110 | 110 |
| | | 575 | 78 | 3 | #4 | 90 | 90 |
| | | 208 | 226 | 3 | 4/0 | 225 | 225 |
| | | 230 | 207 | 3 | 3/0 | 225 | 225 |
| **055B** | **050B** | 380 | 132 | 3 | 1/0 | 150 | 150 |
| | | 460 | 104 | 3 | #2 | 125 | 125 |
| | | 575 | 86 | 3 | #3 | 100 | 100 |
| | | 208 | 249 | 3 | 250 | 250 | 250 |
| | | 230 | 229 | 3 | 4/0 | 250 | 250 |
| **060B** | **055B** | 380 | 147 | 3 | 1/0 | 175 | 175 |
| | | 460 | 115 | 3 | #2 | 125 | 125 |
| | | 575 | 96 | 3 | #3 | 110 | 110 |
| | | 208 | 270 | 3 | 300 | 300 | 300 |
| | | 230 | 248 | 3 | 250 | 250 | 250 |
| **065B** | **060B** | 380 | 160 | 3 | 2/0 | 175 | 175 |
| | | 460 | 124 | 3 | #1 | 150 | 150 |
| | | 575 | 105 | 3 | #2 | 125 | 125 |
| | | 208 | 303 | 3 | 350 | 350 | 350 |
| | | 230 | 282 | 3 | 300 | 350 | 350 |
| **070B** | **065B** | 380 | 164 | 3 | 2/0 | 200 | 200 |
| | | 460 | 138 | 3 | 1/0 | 175 | 175 |
| | | 575 | 115 | 3 | #2 | 125 | 125 |
| | | 208 | 323 | 3 | 400 | 400 | 400 |
| | | 230 | 304 | 3 | 350 | 350 | 350 |
| **080B** | **070B** | 380 | 172 | 3 | 2/0 | 200 | 200 |
| | | 460 | 150 | 3 | 1/0 | 175 | 175 |
| | | 575 | 123 | 3 | #1 | 150 | 150 |

NOTES:
1. Units operating in ambient temperatures above 95°F (35°C) must use the Maximum Fuse or HACR Breaker size
2. All Electrical Data notes are on page 49.
3. Conduit hubs are not provided.

## *Table 32, ACZ BC & AGZ BM Compressor & Fan Motor Amps, Single & Multi-Point (106°F to 125°F)*

| ACZ Unit Size | AGZ Unit Size | Volts | Rated Load Amps | | | | | | F.L.Amps Fan Motors (Each) | No. of Fan Motors | Locked Rotor Amps | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Compressors | | | | | | | | R.L.Amps Fan Motors (Each) | Compressors | | | | | |
| | | | | | | | | | | | | Across-The-Line | | | | | |
| | | | No. 1 | No. 3 | No. 5 | No. 2 | No. 4 | No. 6 | | | | No.1 | No. 3 | No. 5 | No.2 | No.4 | No. 6 |
| | | 208 | 29.0 | 29.0 | - | 29.0 | 29.0 | - | 5.8 | 4 | 23.3 | 189 | 189 | - | 189 | 189 | - |
| | | 230 | 25.7 | 25.7 | - | 25.7 | 25.7 | - | 5.8 | 4 | 26.1 | 189 | 189 | - | 189 | 189 | - |
| **030B** | **026B** | 380 | 14.9 | 14.9 | - | 14.9 | 14.9 | - | 4.1 | 4 | 20.0 | 112 | 112 | - | 112 | 112 | - |
| | | 460 | 13.4 | 13.4 | - | 13.4 | 13.4 | - | 2.8 | 4 | 13.0 | 99 | 99 | - | 99 | 99 | - |
| | | 575 | 9.5 | 9.5 | - | 9.5 | 9.5 | - | 3.0 | 4 | 14.0 | 74 | 74 | - | 74 | 74 | - |
| | | 208 | 29.0 | 29.0 | - | 34.0 | 34.0 | - | 5.8 | 4 | 23.3 | 189 | 189 | - | 232 | 232 | - |
| | | 230 | 25.7 | 25.7 | - | 30.9 | 30.9 | - | 5.8 | 4 | 26.1 | 189 | 189 | - | 232 | 232 | - |
| **035B** | **030B** | 380 | 14.9 | 14.9 | - | 18.6 | 18.6 | - | 4.1 | 4 | 20.0 | 112 | 112 | - | 144 | 144 | - |
| | | 460 | 13.4 | 13.4 | - | 16.2 | 16.2 | - | 2.8 | 4 | 13.0 | 99 | 99 | - | 125 | 125 | - |
| | | 575 | 9.5 | 9.5 | - | 12.2 | 12.2 | - | 3.0 | 4 | 14.0 | 74 | 74 | - | 100 | 100 | - |
| | | 208 | 34.0 | 34.0 | - | 34.0 | 34.0 | - | 5.8 | 4 | 23.3 | 232 | 232 | - | 232 | 232 | - |
| | | 230 | 30.9 | 30.9 | - | 30.9 | 30.9 | - | 5.8 | 4 | 26.1 | 232 | 232 | - | 232 | 232 | - |
| **040B** | **035B** | 380 | 18.6 | 18.6 | - | 18.6 | 18.6 | - | 4.1 | 4 | 20.0 | 144 | 144 | - | 144 | 144 | - |
| | | 460 | 16.2 | 16.2 | - | 16.2 | 16.2 | - | 2.8 | 4 | 13.0 | 125 | 125 | - | 125 | 125 | - |
| | | 575 | 12.2 | 12.2 | - | 12.2 | 12.2 | - | 3.0 | 4 | 14.0 | 100 | 100 | - | 100 | 100 | - |
| | | 208 | 38.5 | 38.5 | - | 38.5 | 38.5 | - | 5.8 | 4 | 23.3 | 278 | 278 | - | 278 | 278 | - |
| | | 230 | 33.8 | 33.8 | - | 33.8 | 33.8 | - | 5.8 | 4 | 26.1 | 278 | 278 | - | 278 | 278 | - |
| **045B** | **040B** | 380 | 22.8 | 22.8 | - | 22.8 | 22.8 | - | 4.1 | 4 | 20.0 | 151 | 151 | - | 151 | 151 | - |
| | | 460 | 17.0 | 17.0 | - | 17.0 | 17.0 | - | 2.8 | 4 | 13.0 | 127 | 127 | - | 127 | 127 | - |
| | | 575 | 13.7 | 13.7 | - | 13.7 | 13.7 | - | 3.0 | 4 | 14.0 | 100 | 100 | - | 100 | 100 | - |
| | | 208 | 38.5 | 38.5 | - | 47.6 | 47.6 | - | 5.8 | 4 | 23.3 | 278 | 278 | - | 350 | 350 | - |
| | | 230 | 33.8 | 33.8 | - | 43.3 | 43.3 | - | 5.8 | 4 | 26.1 | 278 | 278 | - | 350 | 350 | - |
| **050B** | **045B** | 380 | 22.8 | 22.8 | - | 27.2 | 27.2 | - | 4.1 | 4 | 20.0 | 151 | 151 | - | 195 | 195 | - |
| | | 460 | 17.0 | 17.0 | - | 21.8 | 21.8 | - | 2.8 | 4 | 13.0 | 127 | 127 | - | 158 | 158 | - |
| | | 575 | 13.7 | 13.7 | - | 17.3 | 17.3 | - | 3.0 | 4 | 14.0 | 100 | 100 | - | 125 | 125 | - |
| | | 208 | 47.6 | 47.6 | - | 47.6 | 47.6 | - | 5.8 | 4 | 23.3 | 350 | 350 | - | 350 | 350 | - |
| | | 230 | 43.3 | 43.3 | - | 43.3 | 43.3 | - | 5.8 | 4 | 26.1 | 350 | 350 | - | 350 | 350 | - |
| **055B** | **050B** | 380 | 27.2 | 27.2 | - | 27.2 | 27.2 | - | 4.1 | 4 | 20.0 | 195 | 195 | - | 195 | 195 | - |
| | | 460 | 21.8 | 21.8 | - | 21.8 | 21.8 | - | 2.8 | 4 | 13.0 | 158 | 158 | - | 158 | 158 | - |
| | | 575 | 17.3 | 17.3 | - | 17.3 | 17.3 | - | 3.0 | 4 | 14.0 | 125 | 125 | - | 125 | 125 | - |
| | | 208 | 47.6 | 47.6 | - | 58.1 | 58.1 | - | 5.8 | 4 | 23.3 | 350 | 350 | - | 425 | 425 | - |
| | | 230 | 43.3 | 43.3 | - | 52.8 | 52.8 | - | 5.8 | 4 | 26.1 | 350 | 350 | - | 425 | 425 | - |
| **060B** | **055B** | 380 | 27.2 | 27.2 | - | 33.8 | 33.8 | - | 4.1 | 4 | 20.0 | 195 | 195 | - | 239 | 239 | - |
| | | 460 | 21.8 | 21.8 | - | 26.5 | 26.5 | - | 2.8 | 4 | 13.0 | 158 | 158 | - | 187 | 187 | - |
| | | 575 | 17.3 | 17.3 | - | 21.8 | 21.8 | - | 3.0 | 4 | 14.0 | 125 | 125 | - | 148 | 148 | - |
| | | 208 | 58.1 | 58.1 | - | 58.1 | 58.1 | - | 5.8 | 4 | 23.3 | 425 | 425 | - | 425 | 425 | - |
| | | 230 | 52.8 | 52.8 | - | 52.8 | 52.8 | - | 5.8 | 4 | 26.1 | 425 | 425 | - | 425 | 425 | - |
| **065B** | **060B** | 380 | 33.8 | 33.8 | - | 33.8 | 33.8 | - | 4.1 | 4 | 20.0 | 239 | 239 | - | 239 | 239 | - |
| | | 460 | 26.5 | 26.5 | - | 26.5 | 26.5 | - | 2.8 | 4 | 13.0 | 187 | 187 | - | 187 | 187 | - |
| | | 575 | 21.8 | 21.8 | - | 21.8 | 21.8 | - | 3.0 | 4 | 14.0 | 148 | 148 | - | 148 | 148 | - |
| | | 208 | 58.1 | 58.1 | - | 58.1 | 78.0 | - | 7.8 | 4 | 31.7 | 425 | 425 | - | 425 | 505 | - |
| | | 230 | 52.8 | 52.8 | - | 52.8 | 74.1 | - | 7.8 | 4 | 35.6 | 425 | 425 | - | 425 | 505 | - |
| **070B** | **065B** | 380 | 32.7 | 32.7 | - | 32.7 | 39.8 | - | 4.1 | 4 | 20.0 | 239 | 239 | - | 239 | 280 | - |
| | | 460 | 25.5 | 25.5 | | 25.5 | 37.5 | - | 3.6 | 4 | 17.8 | 187 | 187 | - | 187 | 225 | - |
| | | 575 | 21.8 | 21.8 | - | 21.8 | 29.9 | - | 3.0 | 4 | 14.0 | 148 | 148 | - | 148 | 180 | - |
| | | 208 | 58.1 | 78.0 | - | 58.1 | 78.0 | - | 7.8 | 4 | 31.7 | 425 | 505 | - | 425 | 505 | - |
| | | 230 | 52.8 | 74.1 | - | 52.8 | 74.1 | - | 7.8 | 4 | 35.6 | 425 | 505 | - | 425 | 505 | - |
| **080B** | **070B** | 380 | 32.7 | 39.8 | - | 32.7 | 39.8 | - | 4.1 | 4 | 20.0 | 239 | 280 | - | 239 | 280 | - |
| | | 460 | 25.5 | 37.5 | - | 25.5 | 37.5 | - | 3.6 | 4 | 17.8 | 187 | 225 | - | 187 | 225 | - |
| | | 575 | 21.8 | 29.9 | - | 21.8 | 29.9 | - | 3.0 | 4 | 14.0 | 148 | 180 | - | 148 | 180 | - |

All Electrical Data notes are on page 49.

## *Table 33, ACZ BC & AGZ BM Electrical Data, Multi-Point (106°F to 125°F)*

| ACZ Unit Size | AGZ Unit Size | Volts | Electrical Circuit #1 | | | | | Electrical Circuit #2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire | | Recomm'd Fuse or HACR Breaker Size | Max. Fuse or HACR Breaker Size | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire | | Recomm'd Fuse or HACR Breaker Size | Max. Fuse or HACR Breaker Size |
| | | | | Qty | Wire Gauge 75C | | | | Qty | Wire Gauge 75C | | |
| **030B** | **026B** | 208 | 77 | 3 | #4 | 90 | 100 | 77 | 3 | #4 | 90 | 100 |
| | | 230 | 70 | 3 | #4 | 80 | 90 | 70 | 3 | #4 | 80 | 90 |
| | | 380 | 42 | 3 | #8 | 50 | 50 | 40 | 3 | #8 | 50 | 50 |
| | | 460 | 36 | 3 | #8 | 45 | 45 | 36 | 3 | #8 | 45 | 45 |
| | | 575 | 27 | 3 | #10 | 35 | 35 | 27 | 3 | #10 | 35 | 35 |
| **035B** | **030B** | 208 | 77 | 3 | #4 | 90 | 100 | 88 | 3 | #3 | 100 | 110 |
| | | 230 | 70 | 3 | #4 | 80 | 90 | 81 | 3 | #4 | 100 | 110 |
| | | 380 | 42 | 3 | #8 | 50 | 50 | 50 | 3 | #8 | 60 | 60 |
| | | 460 | 36 | 3 | #8 | 45 | 45 | 42 | 3 | #8 | 50 | 50 |
| | | 575 | 27 | 3 | #10 | 35 | 35 | 34 | 3 | #10 | 45 | 45 |
| **040B** | **035B** | 208 | 88 | 3 | #3 | 100 | 110 | 88 | 3 | #3 | 100 | 110 |
| | | 230 | 81 | 3 | #4 | 100 | 110 | 81 | 3 | #4 | 100 | 110 |
| | | 380 | 50 | 3 | #8 | 60 | 60 | 50 | 3 | #8 | 60 | 60 |
| | | 460 | 42 | 3 | #8 | 50 | 50 | 42 | 3 | #8 | 50 | 50 |
| | | 575 | 34 | 3 | #10 | 45 | 45 | 34 | 3 | #10 | 45 | 45 |
| **045B** | **040B** | 208 | 98 | 3 | #3 | 125 | 125 | 98 | 3 | #3 | 125 | 125 |
| | | 230 | 88 | 3 | #3 | 110 | 110 | 88 | 3 | #3 | 110 | 110 |
| | | 380 | 60 | 3 | #6 | 70 | 80 | 60 | 3 | #6 | 70 | 80 |
| | | 460 | 44 | 3 | #8 | 50 | 60 | 44 | 3 | #8 | 50 | 60 |
| | | 575 | 37 | 3 | #8 | 45 | 50 | 37 | 3 | #8 | 45 | 50 |
| **050B** | **045B** | 208 | 98 | 3 | #3 | 125 | 125 | 119 | 3 | #1 | 150 | 150 |
| | | 230 | 88 | 3 | #3 | 110 | 110 | 109 | 3 | #2 | 125 | 150 |
| | | 380 | 60 | 3 | #6 | 70 | 80 | 70 | 3 | #4 | 80 | 90 |
| | | 460 | 44 | 3 | #8 | 50 | 60 | 55 | 3 | #6 | 70 | 70 |
| | | 575 | 37 | 3 | #8 | 45 | 50 | 45 | 3 | #8 | 60 | 60 |
| **055B** | **050B** | 208 | 119 | 3 | #1 | 150 | 150 | 119 | 3 | #1 | 150 | 150 |
| | | 230 | 109 | 3 | #2 | 125 | 150 | 109 | 3 | #2 | 125 | 150 |
| | | 380 | 70 | 3 | #4 | 80 | 90 | 70 | 3 | #4 | 80 | 90 |
| | | 460 | 55 | 3 | #6 | 70 | 70 | 55 | 3 | #6 | 70 | 70 |
| | | 575 | 45 | 3 | #8 | 60 | 60 | 45 | 3 | #8 | 60 | 60 |
| **060B** | **055B** | 208 | 119 | 3 | #1 | 150 | 150 | 142 | 3 | 1/0 | 175 | 200 |
| | | 230 | 109 | 3 | #2 | 125 | 150 | 130 | 3 | #1 | 175 | 175 |
| | | 380 | 70 | 3 | #4 | 80 | 90 | 84 | 3 | #4 | 100 | 110 |
| | | 460 | 55 | 3 | #6 | 70 | 70 | 65 | 3 | #4 | 80 | 90 |
| | | 575 | 45 | 3 | #8 | 60 | 60 | 55 | 3 | #6 | 70 | 70 |
| **065B** | **060B** | 208 | 142 | 3 | 1/0 | 175 | 200 | 142 | 3 | 1/0 | 175 | 200 |
| | | 230 | 130 | 3 | #1 | 175 | 175 | 130 | 3 | #1 | 175 | 175 |
| | | 380 | 84 | 3 | #4 | 100 | 110 | 84 | 3 | #4 | 100 | 110 |
| | | 460 | 65 | 3 | #4 | 80 | 90 | 65 | 3 | #4 | 80 | 90 |
| | | 575 | 55 | 3 | #6 | 70 | 70 | 55 | 3 | #6 | 70 | 70 |
| **070B** | **065B** | 208 | 146 | 3 | 1/0 | 175 | 200 | 171 | 3 | 2/0 | 225 | 225 |
| | | 230 | 134 | 3 | 1/0 | 175 | 175 | 161 | 3 | 2/0 | 200 | 225 |
| | | 380 | 82 | 3 | #4 | 100 | 110 | 91 | 3 | #3 | 110 | 125 |
| | | 460 | 67 | 3 | #6 | 80 | 90 | 80 | 3 | #4 | 100 | 110 |
| | | 575 | 55 | 3 | #6 | 70 | 70 | 65 | 3 | #6 | 90 | 90 |
| **080B** | **070B** | 208 | 171 | 3 | 2/0 | 225 | 225 | 171 | 3 | 2/0 | 225 | 225 |
| | | 230 | 161 | 3 | 2/0 | 200 | 225 | 161 | 3 | 2/0 | 200 | 225 |
| | | 380 | 91 | 3 | #3 | 110 | 125 | 91 | 3 | #3 | 110 | 125 |
| | | 460 | 80 | 3 | #4 | 100 | 110 | 80 | 3 | #4 | 100 | 110 |
| | | 575 | 65 | 3 | #6 | 90 | 90 | 65 | 3 | #6 | 90 | 90 |

Notes:
1. All Electrical Data notes are on page 49.
2. Conduit hubs are not supplied.

## *Table 34, ACZ BC & AGZ BM Electrical Data, Single Point (Above 105°F)*

| ACZ Unit Size | AGZ Unit Size | Volts | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire | | Recomm'd. Fuse Or HACR Breaker Size | Max. Fuse Or HACR Breaker Size |
|---|---|---|---|---|---|---|---|
| | | | | Quantity | Wire Gauge 75C | | |
| | | 208 | 378 | 6 | 250 | 450 | 450 |
| | | 230 | 362 | 6 | 4/0 | 400 | 400 |
| **090B** | **075B** | 380 | 194 | 3 | 3/0 | 225 | 225 |
| | | 460 | 187 | 3 | 3/0 | 225 | 225 |
| | | 575 | 145 | 3 | 1/0 | 175 | 175 |
| | | 208 | 398 | 6 | 250 | 450 | 450 |
| | | 230 | 382 | 6 | 250 | 450 | 450 |
| **100B** | **085B** | 380 | 234 | 3 | 250 | 250 | 250 |
| | | 460 | 200 | 3 | 4/0 | 225 | 225 |
| | | 575 | 151 | 3 | 1/0 | 175 | 175 |
| | | 208 | 416 | 6 | 300 | 500 | 500 |
| | | 230 | 414 | 6 | 300 | 500 | 500 |
| **110B** | **090B** | 380 | 270 | 3 | 300 | 300 | 300 |
| | | 460 | 211 | 3 | 4/0 | 250 | 250 |
| | | 575 | 157 | 3 | 2/0 | 175 | 175 |
| | | 208 | 522 | 6 | 400 | 600 | 600 |
| | | 230 | 463 | 6 | 350 | 500 | 500 |
| **120B** | **100B** | 380 | 273 | 3 | 300 | 300 | 300 |
| | | 460 | 230 | 3 | 4/0 | 250 | 250 |
| | | 575 | 187 | 3 | 3/0 | 200 | 200 |
| | | 208 | 612 | 6 - (2) | 350 | 700 | 700 |
| | | 230 | 528 | 6 - (2) | 300 | 600 | 600 |
| **130B** | **110B** | 380 | 307 | 3 | 350 | 350 | 350 |
| | | 460 | 263 | 3 | 300 | 300 | 300 |
| | | 575 | 211 | 3 | 4/0 | 225 | 225 |
| | | 208 | 613 | 6 - (2) | 350 | 700 | 700 |
| | | 230 | 613 | 6 - (2) | 350 | 700 | 700 |
| **140B** | **120B** | 380 | 352 | 6 - (2) | 4/0 | 400 | 400 |
| | | 460 | 286 | 3 | 350 | 300 | 300 |
| | | 575 | 219 | 3 | 4/0 | 250 | 250 |
| | | 208 | 613 | 6 - (2) | 350 | 700 | 700 |
| | | 230 | 613 | 6 - (2) | 350 | 700 | 700 |
| **155B** | **130B** | 380 | 393 | 6 | 250 | 450 | 450 |
| | | 460 | 307 | 3 | 350 | 350 | 350 |
| | | 575 | 228 | 3 | 250 | 250 | 250 |

**NOTES:**

1. Units operating in ambient temperatures of 95°F (35°C) and above must use the Maximum Fuse or HACR Breaker size.
2. All Electrical Data notes are on page 49.
3. (2) in column with wire qty. indicates that two conduits are required.
4. Conduit hubs are not supplied.

### *Table 35, ACZ BC & AGZ BM Compressor and Fan Motor Amps, Single & Multi-Point (106°F to 125°F*

| ACZ Unit Size | AGZ Unit Size | Volts | Rated Load Amps | | | | | | | No. of Fan Motors | Locked Rotor Amps | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Compressors | | | | | | F.L.Amps Fan Motors (Each) | | R.L.Amps Fan Motors (Each) | Compressors Across-The-Line | | | | | |
| | | | No. 1 | No. 3 | No. 5 | No. 2 | No. 4 | No. 6 | | | | No.1 | No. 3 | No. 5 | No.2 | No.4 | No. 6 |
| | | 208 | 78.0 | 78.0 | | 78.0 | 78.0 | - | 7.8 | 6 | 31.7 | 505 | 505 | - | 505 | 505 | - |
| | | 230 | 74.1 | 74.1 | - | 74.1 | 74.1 | - | 7.8 | 6 | 35.6 | 505 | 505 | - | 505 | 505 | - |
| **090B** | **075B** | 380 | 39.8 | 39.8 | - | 39.8 | 39.8 | - | 4.1 | 6 | 20.0 | 280 | 280 | - | 280 | 280 | - |
| | | 460 | 38.8 | 38.8 | - | 38.8 | 38.8 | - | 3.6 | 6 | 17.8 | 225 | 225 | - | 225 | 225 | - |
| | | 575 | 29.9 | 29.9 | - | 29.9 | 29.9 | - | 3.0 | 6 | 14.0 | 180 | 180 | - | 180 | 180 | - |
| | | 208 | 78.0 | 78.0 | - | 86.9 | 86.9 | - | 7.8 | 6 | 31.7 | 505 | 505 | - | 500 | 500 | - |
| | | 230 | 74.1 | 74.1 | - | 83.3 | 83.3 | - | 7.8 | 6 | 35.6 | 505 | 505 | - | 500 | 500 | - |
| **100B** | **085B** | 380 | 39.8 | 39.8 | - | 57.6 | 57.6 | - | 4.1 | 6 | 20.0 | 280 | 280 | - | 305 | 305 | - |
| | | 460 | 38.8 | 38.8 | - | 44.5 | 44.5 | - | 3.6 | 6 | 17.8 | 225 | 225 | - | 250 | 250 | - |
| | | 575 | 29.9 | 29.9 | - | 32.5 | 32.5 | - | 3.0 | 6 | 14.0 | 180 | 180 | - | 198 | 198 | - |
| | | 208 | 86.9 | 86.9 | - | 86.9 | 86.9 | - | 7.8 | 6 | 31.7 | 500 | 500 | - | 500 | 500 | - |
| | | 230 | 86.4 | 86.4 | - | 86.4 | 86.4 | - | 7.8 | 6 | 35.6 | 500 | 500 | - | 500 | 500 | - |
| **110B** | **090B** | 380 | 57.6 | 57.6 | - | 57.6 | 57.6 | - | 4.1 | 6 | 20.0 | 305 | 305 | - | 305 | 305 | - |
| | | 460 | 44.5 | 44.5 | | 44.5 | 44.5 | - | 3.6 | 6 | 17.8 | 250 | 250 | - | 250 | 250 | - |
| | | 575 | 32.5 | 32.5 | - | 32.5 | 32.5 | - | 3.0 | 6 | 14.0 | 198 | 198 | - | 198 | 198 | - |
| | | 208 | 58.1 | 58.1 | 58.1 | 87.9 | 87.9 | 87.9 | 7.8 | 8 | 31.7 | 425 | 425 | 425 | 505 | 505 | 505 |
| | | 230 | 52.8 | 52.8 | 52.8 | 74.5 | 74.5 | 74.5 | 7.8 | 8 | 35.6 | 425 | 425 | 425 | 505 | 505 | 505 |
| **120B** | **100B** | 380 | 32.7 | 32.7 | 32.7 | 43.8 | 43.8 | 43.8 | 4.1 | 8 | 20.0 | 239 | 239 | 239 | 280 | 280 | 280 |
| | | 460 | 25.5 | 25.5 | 25.5 | 37.5 | 37.5 | 37.5 | 3.6 | 8 | 17.8 | 187 | 187 | 187 | 225 | 225 | 225 |
| | | 575 | 21.8 | 21.8 | 21.8 | 29.9 | 29.9 | 29.9 | 3.0 | 8 | 14.0 | 148 | 148 | 148 | 180 | 180 | 180 |
| | | 208 | 87.9 | 87.9 | 87.9 | 87.9 | 87.9 | 87.9 | 7.8 | 8 | 31.7 | 505 | 505 | 505 | 505 | 505 | 505 |
| | | 230 | 74.5 | 74.5 | 74.5 | 74.5 | 74.5 | 74.5 | 7.8 | 8 | 35.6 | 505 | 505 | 505 | 505 | 505 | 505 |
| **130B** | **110B** | 380 | 43.8 | 43.8 | 43.8 | 43.8 | 43.8 | 43.8 | 4.1 | 8 | 20.0 | 280 | 280 | 280 | 280 | 280 | 280 |
| | | 460 | 37.5 | 37.5 | 37.5 | 37.5 | 37.5 | 37.5 | 3.6 | 8 | 17.8 | 225 | 225 | 225 | 225 | 225 | 225 |
| | | 575 | 29.9 | 29.9 | 29.9 | 29.9 | 29.9 | 29.9 | 3.0 | 8 | 14.0 | 180 | 180 | 180 | 180 | 180 | 180 |
| | | 208 | 87.9 | 87.9 | 87.9 | 88.0 | 88.0 | 88.0 | 7.8 | 8 | 31.7 | 505 | 505 | 505 | 500 | 500 | 500 |
| | | 230 | 87.9 | 87.9 | 87.9 | 88.0 | 88.0 | 88.0 | 7.8 | 8 | 35.6 | 505 | 505 | 505 | 500 | 500 | 500 |
| **140B** | **120B** | 380 | 43.8 | 43.8 | 43.8 | 57.6 | 57.6 | 57.6 | 4.1 | 8 | 20.0 | 280 | 280 | 280 | 305 | 305 | 305 |
| | | 460 | 37.5 | 37.5 | 37.5 | 44.5 | 44.5 | 44.5 | 3.6 | 8 | 17.8 | 225 | 225 | 225 | 250 | 250 | 250 |
| | | 575 | 29.9 | 29.9 | 29.9 | 32.5 | 32.5 | 32.5 | 3.0 | 8 | 14.0 | 180 | 180 | 180 | 198 | 198 | 198 |
| | | 208 | 88.0 | 88.0 | 88.0 | 88.0 | 88.0 | 88.0 | 7.8 | 8 | 31.7 | 500 | 500 | 500 | 500 | 500 | 500 |
| | | 230 | 88.0 | 88.0 | 88.0 | 88.0 | 88.0 | 88.0 | 7.8 | 8 | 35.6 | 500 | 500 | 500 | 500 | 500 | 500 |
| **155B** | **130B** | 380 | 57.6 | 57.6 | 57.6 | 57.6 | 57.6 | 57.6 | 4.1 | 8 | 20.0 | 305 | 305 | 305 | 305 | 305 | 305 |
| | | 460 | 44.5 | 44.5 | 44.5 | 44.5 | 44.5 | 44.5 | 3.6 | 8 | 17.8 | 250 | 250 | 250 | 250 | 250 | 250 |
| | | 575 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | 3.0 | 8 | 14.0 | 198 | 198 | 198 | 198 | 198 | 198 |

All Electrical Data notes are on page 49.

### *Table 36, ACZ BC & AGZ BM Electrical Data, Multi-Point (106°F)*

| ACZ Unit Size | AGZ Unit Size | Volts | Electrical Circuit #1 | | | | | Electrical Circuit #2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire Qty | Power Supply Field Wire Wire Gauge 75C | Recomm'd Fuse or HACR Breaker Size | Max. Fuse or HACR Breaker Size | Minimum Circuit Ampacity (MCA) | Power Supply Field Wire Qty | Power Supply Field Wire Wire Gauge 75C | Recomm'd Fuse or HACR Breaker Size | Max. Fuse or HACR Breaker Size |
| | | 208 | 199 | 3 | 3/0 | 225 | 250 | 199 | 3 | 3/0 | 225 | 250 |
| | | 230 | 190 | 3 | 3/0 | 225 | 250 | 190 | 3 | 3/0 | 225 | 250 |
| **090B** | **075B** | 380 | 102 | 3 | #2 | 125 | 125 | 102 | 3 | #2 | 125 | 125 |
| | | 460 | 99 | 3 | #3 | 110 | 125 | 99 | 3 | #3 | 110 | 125 |
| | | 575 | 76 | 3 | #4 | 90 | 100 | 76 | 3 | #4 | 90 | 100 |
| | | 208 | 199 | 3 | 3/0 | 225 | 250 | 219 | 3 | 4/0 | 250 | 300 |
| | | 230 | 190 | 3 | 3/0 | 225 | 250 | 211 | 3 | 4/0 | 250 | 250 |
| **100B** | **085B** | 380 | 102 | 3 | #2 | 125 | 125 | 142 | 3 | 1/0 | 175 | 175 |
| | | 460 | 99 | 3 | #3 | 110 | 125 | 111 | 3 | #2 | 125 | 150 |
| | | 575 | 76 | 3 | #4 | 90 | 100 | 83 | 3 | #3 | 100 | 110 |
| | | 208 | 219 | 3 | 4/0 | 250 | 300 | 219 | 3 | 4/0 | 250 | 300 |
| | | 230 | 212 | 3 | 4/0 | 250 | 300 | 211 | 3 | 4/0 | 250 | 300 |
| **110B** | **090B** | 380 | 142 | 3 | 1/0 | 175 | 175 | 142 | 3 | 1/0 | 175 | 175 |
| | | 460 | 111 | 3 | #2 | 125 | 150 | 111 | 3 | #2 | 125 | 150 |
| | | 575 | 83 | 3 | #3 | 100 | 110 | 83 | 3 | #3 | 100 | 110 |
| | | 208 | 220 | 3 | 4/0 | 250 | 250 | 317 | 3 | 400 | 350 | 400 |
| | | 230 | 203 | 3 | 4/0 | 225 | 250 | 273 | 3 | 300 | 300 | 300 |
| **120B** | **100B** | 380 | 123 | 3 | #1 | 150 | 150 | 159 | 3 | 2/0 | 175 | 200 |
| | | 460 | 101 | 3 | #2 | 110 | 125 | 136 | 3 | 1/0 | 150 | 175 |
| | | 575 | 83 | 3 | #4 | 100 | 100 | 109 | 3 | #2 | 125 | 125 |
| | | 208 | 317 | 3 | 400 | 350 | 400 | 317 | 3 | 400 | 350 | 400 |
| | | 230 | 273 | 3 | 300 | 300 | 300 | 273 | 3 | 300 | 300 | 300 |
| **130B** | **110B** | 380 | 159 | 3 | 2/0 | 175 | 200 | 159 | 3 | 2/0 | 175 | 200 |
| | | 460 | 136 | 3 | 1/0 | 150 | 175 | 136 | 3 | 1/0 | 150 | 175 |
| | | 575 | 109 | 3 | #2 | 125 | 125 | 109 | 3 | #2 | 125 | 125 |
| | | 208 | 317 | 3 | 400 | 400 | 400 | 317 | 3 | 400 | 400 | 400 |
| | | 230 | 273 | 3 | 300 | 400 | 400 | 317 | 3 | 400 | 400 | 400 |
| **140B** | **120B** | 380 | 159 | 3 | 2/0 | 200 | 200 | 204 | 3 | 4/0 | 250 | 250 |
| | | 460 | 136 | 3 | 1/0 | 175 | 175 | 159 | 3 | 2/0 | 200 | 200 |
| | | 575 | 109 | 3 | #2 | 125 | 125 | 118 | 3 | #1 | 150 | 150 |
| | | 208 | 317 | 3 | 400 | 400 | 400 | 317 | 3 | 400 | 400 | 400 |
| | | 230 | 317 | 3 | 400 | 400 | 400 | 317 | 3 | 400 | 400 | 400 |
| **155B** | **130B** | 380 | 204 | 3 | 4/0 | 250 | 250 | 204 | 3 | 4/0 | 250 | 250 |
| | | 460 | 159 | 3 | 2/0 | 200 | 200 | 159 | 3 | 2/0 | 200 | 200 |
| | | 575 | 118 | 3 | #1 | 150 | 150 | 118 | 3 | #1 | 150 | 150 |

NOTES:
1. All Electrical Data notes are on page 49.
2. Conduit hubs are not supplied.

## Notes for "Electrical Data Single- and Multi-Point" Power:

1. Unit wire size ampacity (MCA) is equal to 125% of the largest compressor-motor RLA plus 100% of RLA of all other loads in the circuit including the control transformer.
2. The control transformer is furnished on the unit and no separate 115V power is required. For both single- and multi-point power connections, the control transformer is in circuit #1 with control power wired from there to circuit #2. In multi-point power, disconnecting power to circuit will disconnect all control power to the unit.
3. If a separate 115V power supply is used for the control circuit, then the wire sizing amps is 10 amps for all unit sizes.
4. Recommended power lead wire sizes for 3 conductors per conduit are based on 100% conductor ampacity in accordance with NEC. Voltage drop has not been included. Therefore, it is recommended that power leads be kept short. All terminal block connections must be made with copper (type THW) wire.
5. "Recommended Fuse Sizes" are selected at approximately 150% to 175% of the largest compressor RLA, plus 100% of all other loads in the circuit.
6. "Maximum Fuse or HACR breaker size" is selected at approximately 225% of the largest compressor RLA, plus 100% of all other loads in the circuit.
7. The recommended power lead wire sizes are based on an ambient temperature of 86°F (30°C). Ampacity correction factors must be applied for other ambient temperatures. Refer to the National Electrical Code Handbook.
8. Must be electrically grounded according to national and local electrical codes.

## Voltage Limitations:

Within ± 10 percent of nameplate rating.

## Notes for "Compressor and Condenser Fan Amp Draw":

1. Compressor RLA values are for wiring sizing purposes only but do not reflect normal operating current draw at rated capacity.

## Notes for "Field Wiring Data"

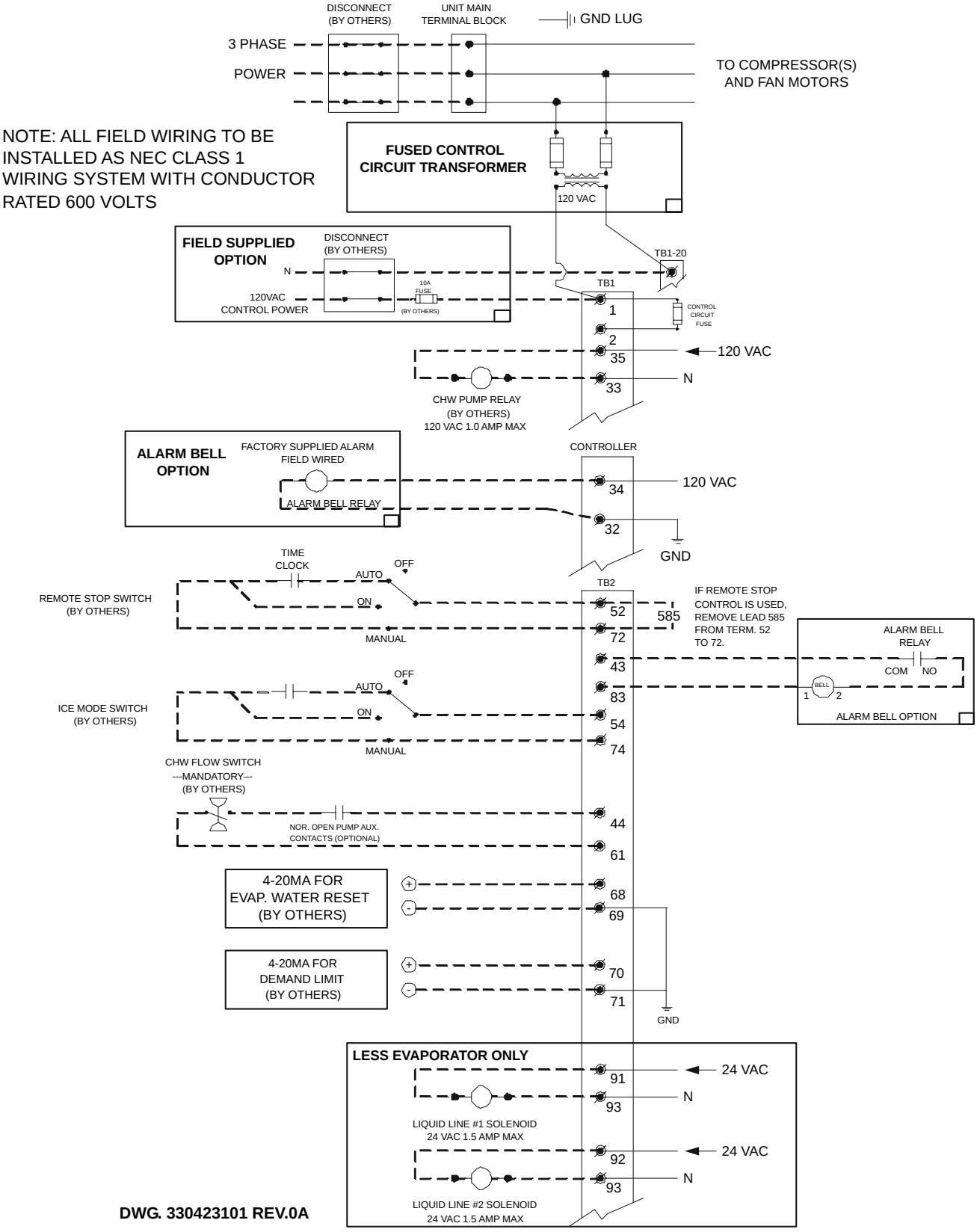
1. Requires a single disconnect to supply electrical power to the unit. This power supply must either be fused or use an HACR type circuit breaker.
2. All field wiring to unit power block or optional non-fused disconnect switch must be copper.
3. All field wire size values given in table apply to 75°C rated wire per NEC.

## Circuit Breakers

Factory installed circuit breakers are standard on units with single point power supply only. This option provides unit installed compressor short circuit protection and makes servicing easier.

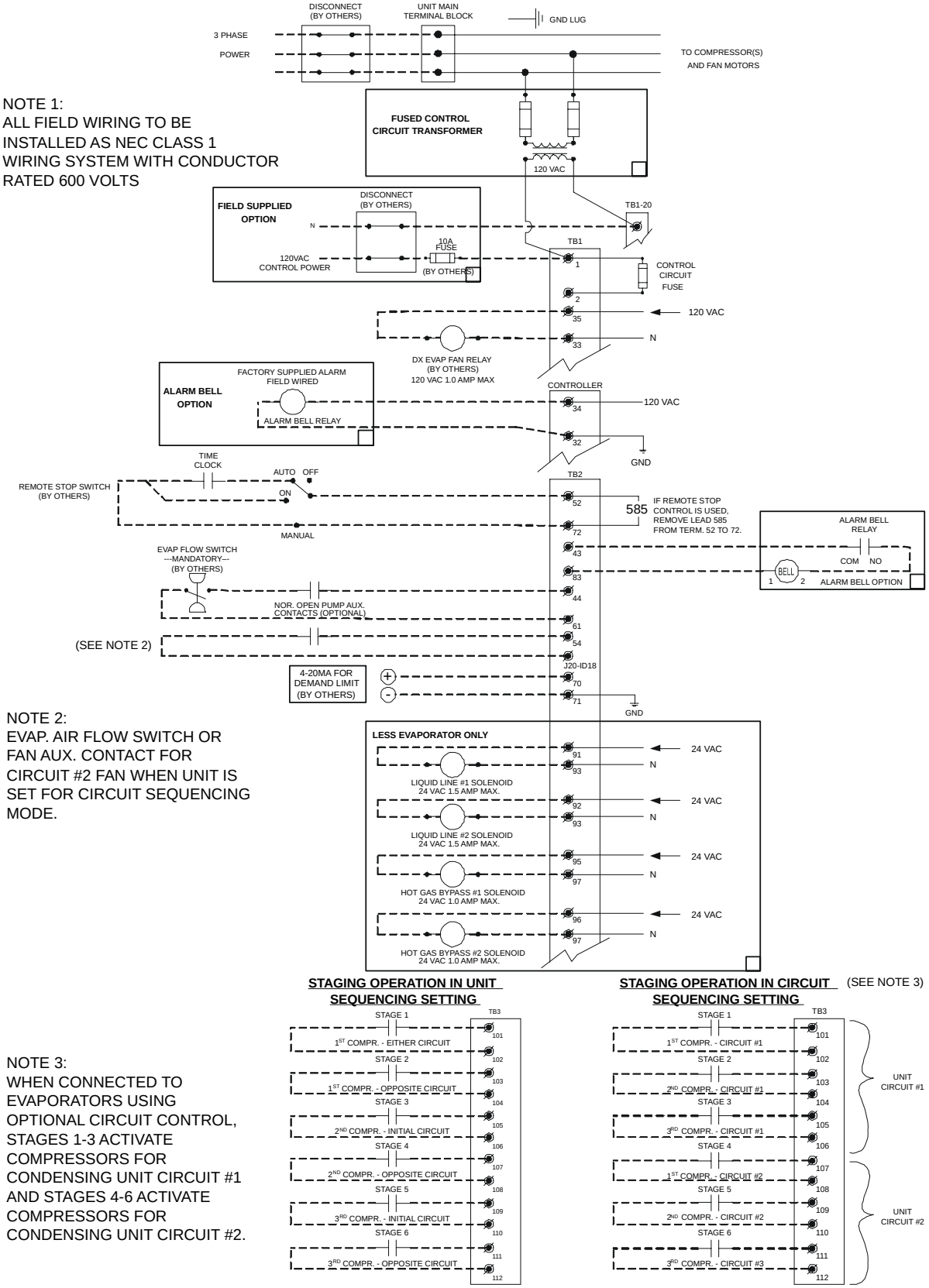
| Connection Type | Power Block | Disconnect Swt. | Circuit Breakers | High Short Circuit Current |
|---|---|---|---|---|
| Single Point (Standard) | Std | Opt. | Std | Opt |
| Multi-Point (Optional) | Std | Opt. | Not Avail. | Opt. |

## *Figure 24, AGZ-BM, Typical Field Wiring Diagram*




**DWG. 330423101 REV.0A**

## *Figure 25, ACZ-B, Typical Field Wiring Diagram*




NOTE 1:
ALL FIELD WIRING TO BE INSTALLED AS NEC CLASS 1 WIRING SYSTEM WITH CONDUCTOR RATED 600 VOLTS

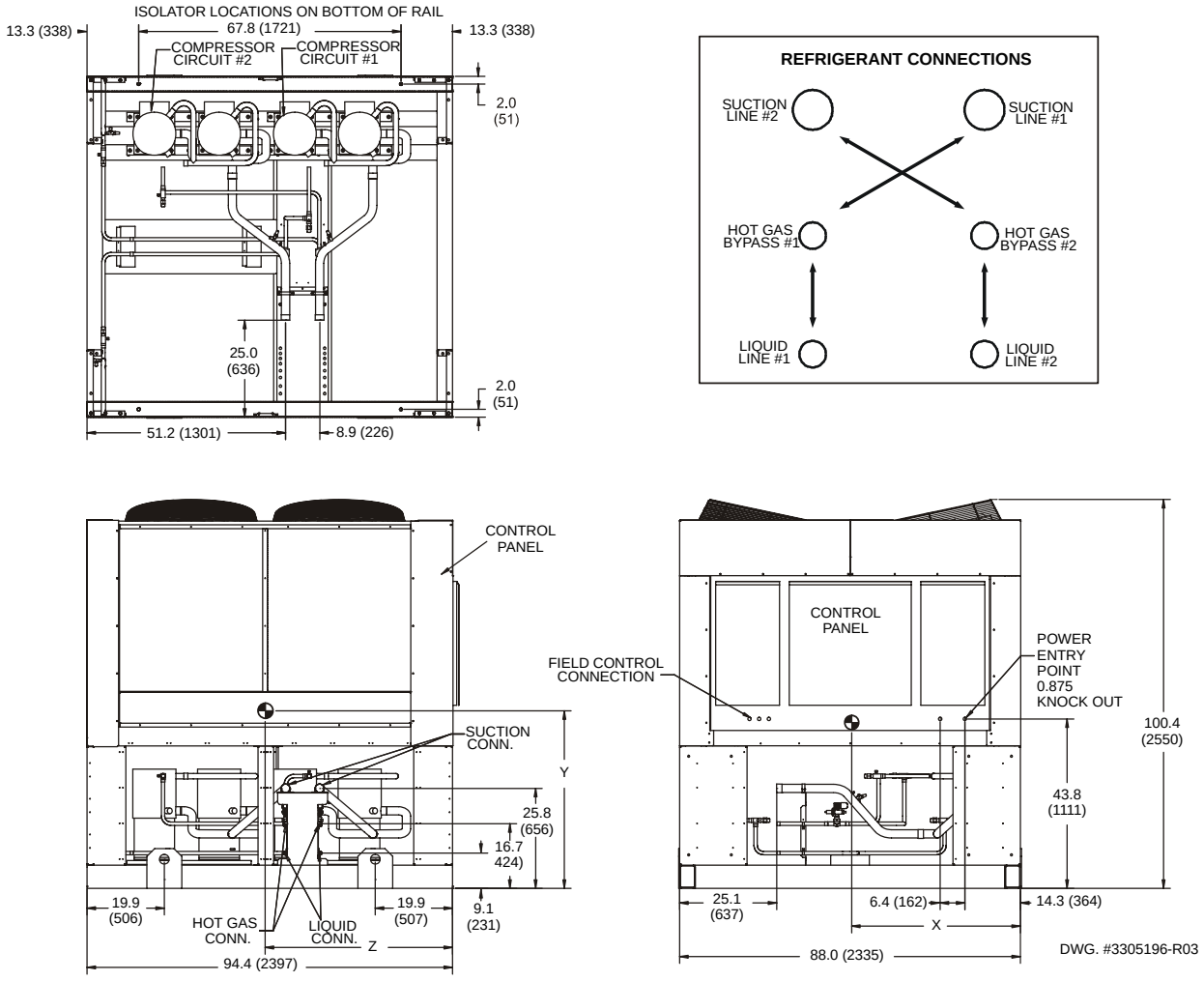
NOTE 2:
EVAP. AIR FLOW SWITCH OR FAN AUX. CONTACT FOR CIRCUIT #2 FAN WHEN UNIT IS SET FOR CIRCUIT SEQUENCING MODE.

NOTE 3:
WHEN CONNECTED TO EVAPORATORS USING OPTIONAL CIRCUIT CONTROL, STAGES 1-3 ACTIVATE COMPRESSORS FOR CONDENSING UNIT CIRCUIT #1 AND STAGES 4-6 ACTIVATE COMPRESSORS FOR CONDENSING UNIT CIRCUIT #2.

**LABEL DWG. 330423201 REV.0D**

# Dimensional Data

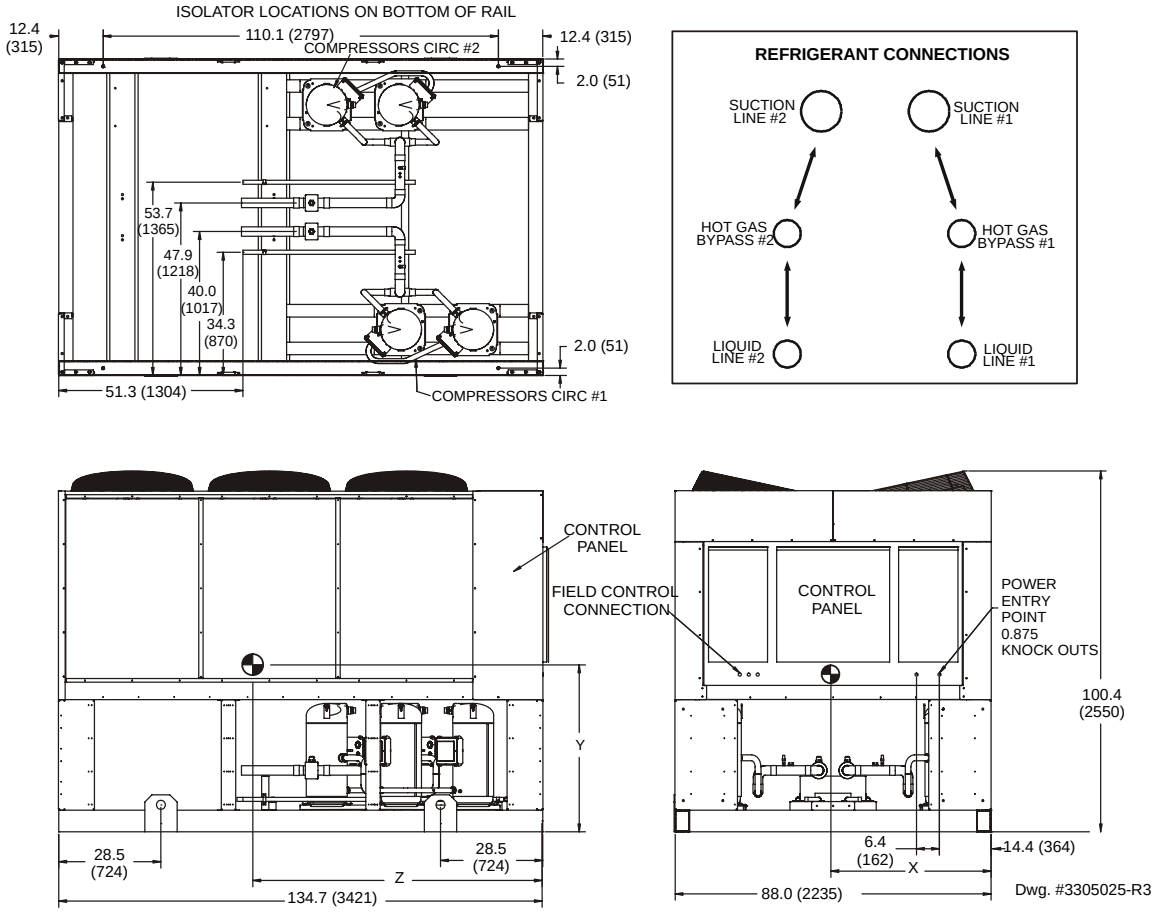
***Figure 26, Dimensions: ACZ 030B - 080B***
***AGZ 026BM – 070BM***




**NOTES**:
1. Hail and wind guards add 20 inches to the width of each side.
2. Be sure that the expansion valves' sensing bulb and capillary are attached to the correct suction line.

| ACZ-B Unit Size | AGZ-BM Unit Size | Liquid Conn. | Suction Conn. | Center of Gravity in. (mm) | | | Weights lbs. (kg) | |
|---|---|---|---|---|---|---|---|---|
| | | | | X | Y | Z | Shipping | Operating |
| **030B** | **026BM** | (2) 1 3/8 | (2) 2 1/8 | 36 (914) | 42 (1067) | 42 (1067) | 3550 (1610) | 3600 (1633) |
| **035B** | **030BM** | (2) 1 3/8 | (2) 2 1/8 | 36 (914) | 42 (1067) | 42 (1067) | 3550 (1610) | 3600 (1633) |
| **040B** | **035BM** | (2) 1 3/8 | (2) 2 1/8 | 36 (914) | 42 (1067) | 42 (1067) | 3550 (1610) | 3600 (1633) |
| **045B** | **040BM** | (2) 1 3/8 | (2) 2 1/8 | 36 (914) | 41 (1041) | 41 (1041) | 3550 (1610) | 3610 (1637) |
| **050B** | **045BM** | (2) 1 3/8 | (2) 2 1/8 | 36 (914) | 41 (1041) | 41 (1041) | 3590 (1628) | 3650 (1656) |
| **055B** | **050BM** | (2) 1 3/8 | (2) 2 5/8 | 36 (914) | 42 (1067) | 42 (1067) | 3730 (1692) | 3800 (1724) |
| **060B** | **055BM** | (2) 1 3/8 | (2) 2 5/8 | 35 (889) | 42 (1067) | 43 (1092) | 3780 (1715) | 3850 (1746) |
| **065B** | **060BM** | (2) 1 3/8 | (2) 2 5/8 | 35 (889) | 42 (1067) | 43 (1092) | 3820 (1733) | 4040 (1833) |
| **070B** | **065BM** | (2) 1 3/8 | (2) 2 5/8 | 35 (889) | 43 (1092) | 45 (1143) | 3970 (1801) | 4070 (1846) |
| **080B** | **070BM** | (2) 1 3/8 | (2) 2 5/8 | 36 (914) | 44 (1118) | 46 (1168) | 4080 (1851) | 4180 (1896) |

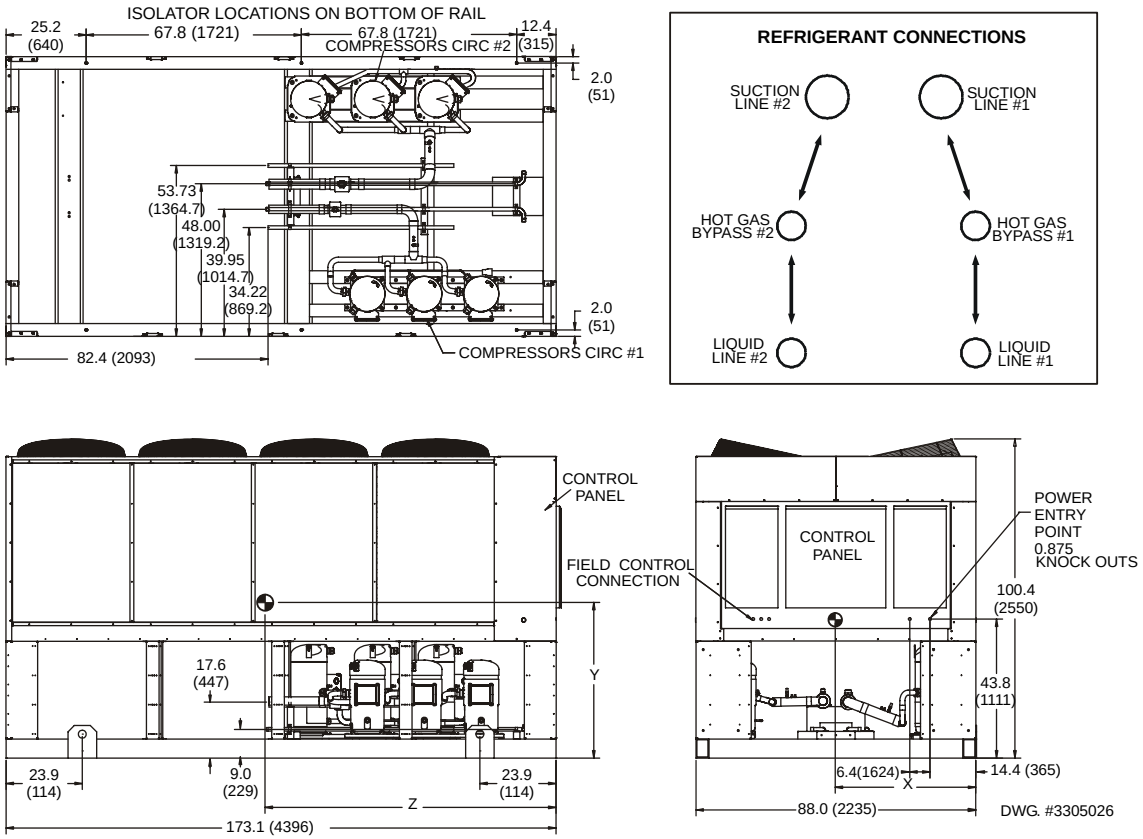
## *Figure 27, Dimensions: ACZ 090B - 110B*
## *AGZ 075BM – 090BM*




**NOTES**:
1. Hail and wind guards add 20 inches to the width of each side.
2. Be sure that the expansion valves' sensing bulb and capillary are attached to the correct suction line.

| ACZ-B Unit Size | AGZ-BM Unit Size | Liquid Conn. | Suction Conn. | Center of Gravity Inches (mm) | | | Weights Lbs. (kg) | |
|---|---|---|---|---|---|---|---|---|
| | | | | X | Y | Z | Shipping Weight | Operating Weight |
| **090B** | **075BM** | (2) 1 3/8 | (2) 3 1/8 | 44 (1118) | 46 (1168) | 58 (1473) | 5510 (2499) | 5630 (2554) |
| **100B** | **085BM** | (2) 1 3/8 | (2) 3 1/8 | 43 (1092) | 44 (1118) | 58 (1473) | 5670 (2572) | 5790 (2626) |
| **110B** | **090BM** | (2) 1 3/8 | (2) 3 1/8 | 44 (1118) | 41 (1041) | 57 (1448) | 5830 (5830) | 5950 (2699) |

## *Figure 28, Dimensions: ACZ 120B - 155B*
## *AGZ 100BM – 130BM*

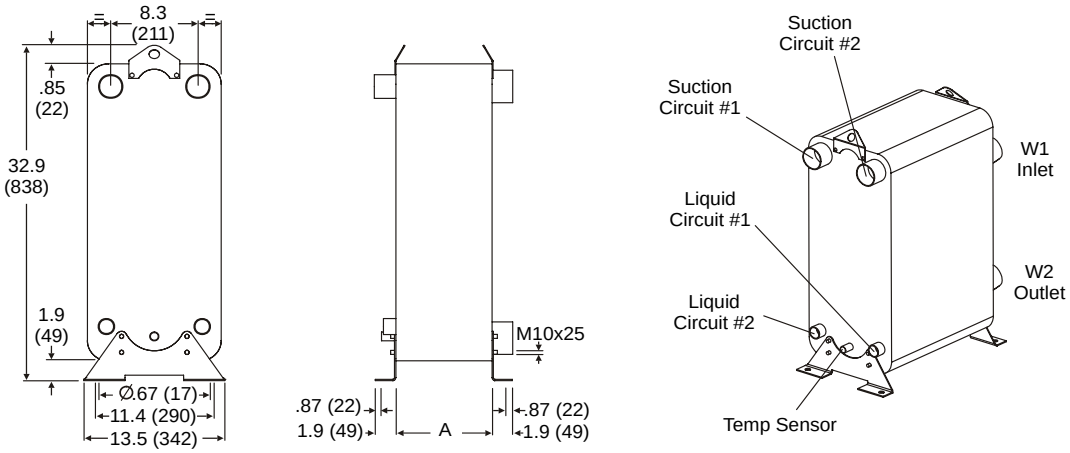



NOTES:
1. Hail and wind guards add 20 inches to the width of each side.
2. Be sure that the expansion valves' sensing bulb and capillary are attached to the correct suction line.

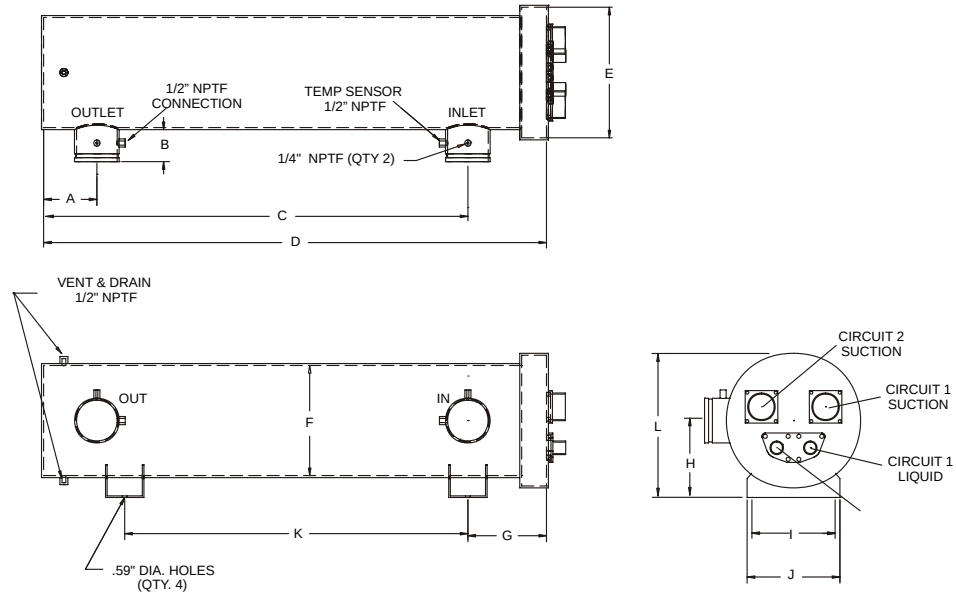
| ACZ-B Unit Size | AGZ-BM Unit Size | Liquid Conn. | Suction Conn. | Center of Gravity Inches (mm) | | | Weights Lbs. (kg) | |
|---|---|---|---|---|---|---|---|---|
| | | | | X | Y | Z | Shipping Weight | Operating Weight |
| **120B** | **100BM** | (2) 1 3/8 | (2) 3 1/8 | 43 (1092) | 46 (1168) | 75 (1905) | 6820 (3094) | 6970 (3162) |
| **130B** | **110BM** | (2) 1 3/8 | (2) 3 1/8 | 44 (1118) | 46 (1168) | 73 (1854) | 7080 (3211) | 7230 (3280) |
| **140B** | **120BM** | (2) 1 3/8 | (2) 3 1/8 | 43 (1092) | 63 (1600) | 73 (1854) | 7360 (3338) | 7480 (3393) |
| **155B** | **130BM** | (2) 1 3/8 | (2) 3 1/8 | 44 (1118) | 40 (1016) | 71 (1803) | 7640 (3466) | 7760 (3520) |

# Remote Evaporators

***Figure 29, Remote Evaporators, AGZ 026BM – 130BM***




| AGZ Model | Liquid Line Conn. Brazed, in | Suction Line Conn. Brazed, in (S). | Temp. Sensor NPT, in. (TS) | Victaulic Water Conn. In. (W) | Dimension "A" in. (mm) |
|---|---|---|---|---|---|
| **026** | 1.375 | 2.125 | 0.75 | 3.0 | 8.3 (210) |
| **030** | 1.375 | 2.125 | 0.75 | 3.0 | 8.3 (210) |
| **035** | 1.375 | 2.125 | 0.75 | 3.0 | 9.2 (233) |
| **040** | 1.375 | 2.125 | 0.75 | 3.0 | 10.5 (267) |
| **045** | 1.375 | 2.125 | 0.75 | 3.0 | 11.8 (300) |
| **050** | 1.375 | 2.125 | 0.75 | 3.0 | 13.1 (336) |
| **055** | 1.375 | 2.125 | 0.75 | 3.0 | 15.0 (380) |
| **060** | 1.375 | 2.625 | 0.75 | 3.0 | 16.7 (425) |
| **065** | 1.375 | 2.625 | 0.75 | 3.0 | 19.0 (481) |
| **070** | 1.375 | 2.625 | 0.75 | 3.0 | 19.0 (481) |

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| AGZ Model | A | B | C | D | E | F | G | H | I | J | K | L | W (Water) | S (Suction) | L (Liquid) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **075** | 6.6 | 3.9 | 52.2 | 61.9 | 16.0 | 13.5 | 9.7 | 9.5 | 10.2 | 11.4 | 42.2 | 17.7 | (2) 5.0 | (2) 3.125 | (2) 1.375 |
| **085** | 6.6 | 3.9 | 52.2 | 61.9 | 16.0 | 13.5 | 9.7 | 9.5 | 10.2 | 11.4 | 42.2 | 17.7 | (2) 5.0 | (2) 3.125 | (2) 1.375 |
| **090** | 6.6 | 3.9 | 52.2 | 61.9 | 16.0 | 13.5 | 9.7 | 9.5 | 10.2 | 11.4 | 42.2 | 17.7 | (2) 5.0 | (2) 3.125 | (2) 1.375 |
| **100** | 6.4 | 3.9 | 85.2 | 94.6 | 15.3 | 12.8 | 11.0 | 10.2 | 12.6 | 13.8 | 72.1 | 17.8 | (2) 5.0 | (2) 3.125 | (2) 1.375 |
| **110** | 6.4 | 3.9 | 85.2 | 94.6 | 15.3 | 12.8 | 11.0 | 10.2 | 12.6 | 13.8 | 72.1 | 17.8 | (2) 5.0 | (2) 3.125 | (2) 1.375 |
| **120** | 6.8 | 4.0 | 84.0 | 95.5 | 16.5 | 14.0 | 11.9 | 10.2 | 12.6 | 13.8 | 72.1 | 18.4 | (2) 8.0 | (2) 3.125 | (2) 1.375 |
| **130** | 6.8 | 4.0 | 84.0 | 95.5 | 16.5 | 14.0 | 11.9 | 10.2 | 12.6 | 13.8 | 72.1 | 18.4 | (2) 8.0 | (2) 3.125 | (2) 1.375 |

**NOTE:** Water connections are victaulic sized in inches. Refrigerant connections are IDS sized in inches.

# Optional Features

Any of the following options can be included on a unit:

## Controls

### Hot Gas Bypass

Hot gas bypass permits unit operation down to 10% of full load capacity. This option includes a factory-mounted hot gas bypass valve, solenoid valve, and manual shutoff valve for each circuit.

### Head Pressure Control

Fan VFD low ambient control allows unit operation down to 0°F (-18°C). (Not available on 380 volt, 60 Hertz units.)

### Water Flow Switch (AGZ-BM only)

(P/N 017503300) A water flow switch is available for field installation in the chilled water piping to avoid evaporator freeze-up under low or no flow conditions. Terminals are provided in the unit control center for field hook-up of the water flow switch. If this option is not ordered with the unit, then a field supplied water flow switch must be installed.

### Alarm Bell

Field-installed and wired to the control panel to provide remote indication of unit alarm condition. See Field Wiring Diagram for connection locations.

### BAS Interface (Protocol Selectability™ Feature)

#### Connection to Chiller

Connection to the chiller for all Building Automation System (BAS) protocols will be at the unit controller. An interface card, depending on the protocol being used, can be factory-installed in the unit controller (or it can be field-installed).

#### Protocols Supported

***Table 37, Standard Protocol Data***

| Protocol | Physical Layer | Data Rate | Controller | Other |
|---|---|---|---|---|
| BACnet®/IP or BACnet/Ethernet | Ethernet 10 Base-T | 10 Megabits/sec | pCO$^2$ Unit Controller | Reference ED 15057: BACnet PICS |
| BACnet MSTP | RS-485 | (TBD) | pCO$^2$ Unit Controller | Reference ED 15057: BACnet PICS |
| LONWORKS® | FTT-10A | 78kbits/sec | pCO$^2$ Unit Controller | LONMARK® Chiller Functional Profile |
| Modbus RTU? | RS-485or RS-232 | (TBD) | pCO$^2$ Unit Controller | |

**Note**: For additional information on the protocol data available through the BACnet or LONWORKS communications modules reference ED 15062, *MicroTech II Chiller Unit Controller Protocol Information.*

Modbus – When selected, the ident number and baud rate can also be changed to suit the application.

LONWORKS – When selected, the ident number and baud rate setpoints are not available. Baud rate is locked at 4800.

BACnet – When selected, the ident number and baud rate setpoints are not available. Baud rate is locked at 19200.

The interface kits on the MicroTech II™ controller are as follows:

- BACnet Kit P/N 350147404: BACnet/IP, BACnet MS/TP, or BACnet Ethernet
- LONWORKS Kit P/N 350147401: LonTalk (FTT-10A)
- Modbus RTU

The following functions are available through the BAS where possible. Exact capabilities can vary depending on the protocol in use.

- Enable/Disable chiller operation by setting the Unit Enable setpoint.
- Select the operating mode by setting the Unit Mode setpoint.
- Set the Cool LWT and Ice LWT setpoints.
- Read all digital and analog I/O values.
- Read Enable status of chiller.
- Read current operating mode and status (state) of chiller.
- Send a description of each alarm when it occurs.

Reference documents ED 15057, ED 15062 and ED 15063 can be obtained from the local McQuay sales office, or they can also be found on www.mcquay.com under Product Information > (chiller type) > Control Integration.

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# Unit

## Vibration Isolators

Spring or neoprene-in-shear vibration isolators are available for field installation to reduce vibration transmission through the unit base. See page 12 for detailed information on their installation.

## Protective Base Guards

Optional factory installed vinyl-coated welded wire base guards provide all-around lower unit protection on ground level installations. Coil guards are standard.

## Copper Fin Condenser Coils

Copper fin condenser coils are available as an option on all models.

## Black Fin Coils

Aluminum fin stock precoated with a phenolic coating with 1000 hour salt spray resistance (ASTM B117-90).

## Coated Fins

Copper or aluminum fins coated with *ElectroFin*® baked epoxy protective coating with 3000+ hour salt spray resistance (ASTM B117-90).

## Evaporator Insulation (AGZ-BM only)

Double insulation thickness (total of 1 ½ inch) for high humidity areas or low fluid temperatures.

## Sound Reduction

Acoustical blankets are factory-installed on each compressor.

## Hail and Wind Guards

A field-mounted option shipped as a kit including panels, fasteners, and instructions. See page 26 for further information.

### Refrigerant Specialties Kit

Required on AGZ-BM Remote Evaporator units consisting of thermal expansion valve, solenoid valve, sight glass and filter-drier (sealed on Models 026 to 070, replaceable core on Models 075 to 130).

## Electrical

### Multi-Point Electrical Connection

Provides a power connection to each of the unit's two electrical circuits.

### Disconnect Switch with Through-the-Door Handle

A factory or field-installed option for service use, nonfused disconnect switch (mounted inside the power section of the control box) with a through-the-door handle is available with single and multi-point power supply.

### Phase Loss/Voltage Protection

Phase loss with under/over voltage protection and multiple LED indication of fault type is available as a factory-installed option to guard against compressor motor burnout.

### Convenience Outlet

10.0 amp, 115 volt outlet located in control panel to provide power for servicing unit.

### Ground Fault Protection

Protects equipment from damage from line-to-ground fault currents less than those required for conductor protection.

### High Short Circuit Current Protection

Provides control panel protection against short circuit currents per following table:

| Voltage | 208 | 240 | 460 | 600 |
|---|---|---|---|---|
| Current (kA) | 120 | 100 | 65 | 25 |

### High Ambient Control Panel

Consists of exhaust fan with rain hood, two inlet screens with filters, necessary controls and wiring to allow operation to 125°F. The option can be factory or field-installed as a kit. Must be used for:

- Ambient temperatures above 105°F (40°C) with fan VFD (low ambient option)
- Ambient temperatures above 115°F (46°C) with standard FanTrol control.

# Start-up

## Pre Start-up

The unit must be inspected to see that no components became loose or damaged during shipping or installation.

## Start-Up

There should be adequate building load (at least 50 percent of the unit full load capacity) to properly check the operation of the unit's refrigerant circuits.

Record all operating parameters required by the "Compressorized Equipment Warranty Form". Return this information within 10 working days to McQuay International as instructed on the form to register the start-up date with the McQuay Warranty Department.

1. Verify chilled water or air-flow.
2. Verify that the remote start / stop or time clock has requested the chiller to start.
3. Set the thermostat setpoint to required temperature. For AGZ-AM units, the system water temperature must be greater than the total of the leaving water temperature setpoint plus 1/2 the control band before the MicroTech II controller will stage on cooling. Set the Evap Delta T and the Start Delta T as a starting point.
4. Put both pumpdown switches (PS1 and PS2) to the ON position.
5. Put system switch (S1) to ON position.

| Switch | Switch Position | |
|---|---|---|
| | ON | OFF |
| PS1, PS2, Pumpdown Switches | Circuits will operate in the normal automatic mode | Circuit will go through the normal pumpdown cycle and shut off. |
| S1, System Switch | Unit will operate in the normal automatic mode | Unit will shut off immediately without pumping down (emergency stop) |

6. There can be a delay of 2 minutes after closing S1. The time delay is due to the compressor inherent motor protection or the Stage Up Timer counting. This should only occur on initial start-up or when power to the chiller has been turned off and back on. More than one compressor will not start at the same time.
7. After the chiller has been operating for a period of time and has become stable, check the following:
   - Compressor oil level. (Some scroll compressors do not have oil sight glasses)
   - Refrigerant sight glass for flashing.
   - Rotation of condenser fans.
8. Complete the "Compressorized Equipment Warranty Form".

# Shutdown

## Temporary

1. Put both circuit switches to the OFF position (Pumpdown and Stop).
2. After compressors have stopped, put System Switch (S1) to OFF (emergency stop).
3. Turn off chilled water pump or air handler if applicable. Chilled water pump to operate while compressors are pumping down.

To start the chiller after a temporary shutdown, follow the start-up instructions.

## Extended

1. Front seat both condenser liquid line service valves.
2. Put both circuit switches to the OFF position (Pumpdown and Stop position.)
3. After the compressors have stopped, put System Switch (S1) to the OFF position (emergency stop).
4. Front seat both refrigerant circuit discharge valves (if applicable).
5. If electrical power is on to unit, the compressor crankcase heaters will keep the liquid refrigerant out of the compressor oil. This will minimize start-up time when putting the unit back into service. The evaporator heater will be able to function.
6. If electrical power is off, tag all opened electrical disconnect switches to warn against start-up before the refrigerant valves are in the correct operating position. When starting the unit, electrical power must be on for 24 hours before starting the chiller.

To start the chiller after an extended shutdown, follow the prestart-up and start-up instructions.

# Water Piping Checkout

1. Check the pump operation and vent all air from the system.
2. Circulate evaporator water checking for proper system pressure and pressure drop across the chiller barrel. Compare the pressure drop to the evaporator water pressure drop curve.
3. Clean all water strainers before placing the unit into service.

# Refrigerant Piping Checkout

1. Check all exposed brazed joints on the unit, as well as any field-installed piping, for evidence of leaks. Joints can have been damaged during shipping or when the unit was installed.
2. Check that all refrigerant valves are either opened or closed as required for proper operation of the unit.
3. A thorough leak test must be done using an approved electronic leak detector. Check all valve stem packing for leaks. Replace all refrigerant valve caps and tighten.
4. Check all refrigerant lines to see that they will not vibrate against each other or against other unit components and are properly supported.
5. Check all flare connections and all refrigerant threaded connectors.
6. Look for any signs of refrigerant leaks around the condenser coils and for damage during shipping or installation.
7. Leak detector is applied externally to refrigerant joints at the factory. Do not confuse this residue with an oil leak.
8. Connect refrigerant service gauges to each refrigerant circuit before starting unit.

## Electrical Check Out

**⚠ CAUTION**

**Electrical power must be applied to the compressor crankcase heaters 24 hours before starting unit to drive off refrigerant from the oil or compressor damage can occur.**

1. Open all electrical disconnects and check all power wiring connections. Start at the power block and check all connections through all components to and including the compressor terminals. These should be checked again after 3 months of operation and at least annually thereafter.
2. Check all control wiring by pulling on the wire at the spade connections and tighten all screw connections. Check plug-in relays for proper seating and that retaining clips are installed.
3. Put System Switch (S1) to the Emergency Stop position.
4. Put both circuit #1 & #2 switches to the Pumpdown and Stop position.
5. Apply power to the unit. The panel Alarm Light will stay on until S1 is closed. Ignore the Alarm Light for the checkout period. If you have the optional Alarm Bell, you can disconnect it.
6. Check at the power block or disconnect for the proper voltage and for the proper voltage between phases. Check power for proper phasing using a phase sequence meter before starting unit.
7. Check for 120Vac at the control transformer and at TB-2 terminal #1 and the neutral block (NB).
8. Check between TB-2 terminal #7 and NB for 120Vac supply for transformer #2.
9. Check between TB-2 terminal #2 and NB for 120Vac control voltage. This supplies the compressor crank case heaters.
10. Check between TB-3 terminal #17 and #27 for 24Vac control voltage.

# Operation

## Hot Gas Bypass (Optional)

This option allows the system to operate at lower loads without excessive on/off compressor cycling. The hot gas bypass option is required to be on both refrigerant circuits because of the lead / lag feature of the controller.

This option allows passage of discharge gas into the evaporator inlet (between the TX valve and the evaporator) which generates a false load to supplement the actual chilled water or air handler load.

**Note:** The hot gas bypass valve cannot generate a 100% false load.

The valve that is supplied can provide a load of approximately 10 tons. The system load added to the ten tons of the hot gas bypass valve has to exceed the compressor capacity for stage 1 compressors to produce stable system operation. This requires 3-6 tons of system load.

The MicroTech II controls solenoid valves in the hot gas bypass lines that are energized whenever their circuit is operating with only one compressor running. The hot gas valve is regulated by the evaporator pressure and the remote adjustable bulb. The pressure regulating valve is factory set to begin opening at 58 psig (32°F for R-22).

**⚠ WARNING**

**The hot gas line can become hot enough to cause injury. Be careful during valve checkout.**

## VFD Low Ambient Control (Optional)

The optional VFD fan control is used for unit operation below 35°F (2°C) down to a minimum of 0°F (-17°C). The control looks at the saturated discharge temperature and varies the fan speed to hold the temperature (pressure) at the "target" temperature. This temperature is established as an input to a setpoint screen labeled "Sat Condenser Temp Target".

## Filter-Driers (AGZ-BM)

A full flow filter-drier (AGZ 026 – 070) or a replaceable core type filter-drier (AGZ 075 – 130) for each refrigerant circuit is shipped loose for field mounting. The core assembly of the replaceable core drier consists of a filter core held tightly in the shell to allow full flow without bypass.

Pressure drop across the filter-drier at full load conditions must not exceed 10 psig at full load. See Table 38 for pressure drop at other load points. Replace the filter-drier if the pressure drop exceeds maximum.

**⚠ WARNING**

**Pump out refrigerant before removing end flange for replacement of core(s). Lowering refrigerant pressure will help prevent accidental blow-off of cover causing possible bodily injury. EPA recovery regulations apply to this procedure.**

A condenser liquid line service valve is provided for isolating the charge in the condenser, but also serves as the point from which the liquid line can be pumped out. With the line free of refrigerant, the filter-drier core(s) can be easily replaced.

## System Adjustment

To maintain peak performance at full load operation, the system superheat and liquid subcooling can require adjustment. Read the following subsections closely to determine if adjustment is required.

## Liquid Line Sight Glass and Moisture Indicator

The color of the moisture indicator is an indication of the dryness of the system and is extremely important when the system has been serviced. Immediately after the system has been opened for service, the element can indicate a wet condition. It is recommended that the equipment operate for about 12 hours to allow the system to reach equilibrium before deciding if the system requires a change of drier cores.

Bubbles in the sight glass at constant full load indicates a shortage of refrigerant, a plugged filter-drier, or a restriction in the liquid line. However, it is not unusual to see bubbles in the sight glass during changing load conditions.

## Refrigerant Charging

Liquid line subcooling at the liquid shut-off valve should be between 15 and 20 degrees F at full load. If the unit is at steady full load operation and bubbles are visible in the sight glass, then check liquid subcooling.

## Thermostatic Expansion Valve

The expansion valve performs one specific function. It keeps the evaporator supplied with the proper amount of refrigerant to satisfy the load conditions.

The sensing bulb of the expansion valve is installed in the closest straight run of suction line from the evaporator. The bulb is held on by clamps around the suction line and is insulated to reduce the effect of surrounding ambient temperatures. In case the bulb must be removed, simply slit the insulation on each side of the bulb, remove the clamps and then remove the capillary tubing that runs along the suction line from the valve.

The power element is removable from the valve body without removing the valve from the line.

**NOTE**: Before adjusting superheat, check that unit charge is correct and liquid line sight glass is full with no bubbles and that the circuit is operating under stable, full load conditions.

The suction superheat for the suction leaving the evaporator is set at the factory for 8 to 12 degrees F at full load. To have full rated unit performance, the superheat must be about 8 degrees F at 95°F outdoor ambient temperature.

# Crankcase Heaters

The scroll compressors are equipped with externally mounted band heaters located at the oil sump level. The function of the heater is to keep the temperature in the crankcase high enough to prevent refrigerant from migrating to the crankcase and condensing in the oil during off-cycle.

**NOTE**: Power must be supplied to the heaters 24 hours before starting the compressors.

## Evaporator

### Models AGZ 026 through 070

The evaporator is a compact, high efficiency, dual circuit, brazed plate-to-plate type heat exchanger consisting of parallel stainless steel plates.

The evaporator is protected with an electric resistance heater and insulated with 3/4" (19mm) thick closed-cell polyurethane insulation. This provides freeze protection down to -20°F (-29°C) ambient air temperature.

The water side working pressure is 363 psig (2503 kPa). Evaporators are designed and constructed according to, and listed by, Underwriters Laboratories (UL).

### Models AGZ 075 through 130

The evaporator is direct expansion, shell-and-tube type with water flowing in the baffled shell side and refrigerant flowing through the tubes. Two independent refrigerant circuits within the evaporator serve the unit's dual refrigerant circuits.

The evaporator has a carbon steel shell and seamless high efficiency copper tubes, roller expanded into a carbon steel tube sheet.

3/8" (10mm) vent and drain plugs are provided on the top and bottom of the shell.

The evaporator is wrapped with an electric resistance heater cable and insulated with 3/4" (19mm) thick vinyl nitrate polymer sheet insulation, protecting against water freeze-up at ambient air temperatures to -20°F (-29°C). An ambient air thermostat controls the heater cable. The fitted and glued-in-place insulation has a K factor of 0.28 Btu in/hr $ft^2$ at 75°F.

The refrigerant (tube) side maximum working pressure is 300 psig (2068 kPa). The water-side working pressure is 152 psig (1048 kPa). Each evaporator is designed, constructed, inspected, and stamped according to the requirements of the ASME Boiler and Pressure Vessel Code. Double thickness insulation is available as an option.

# Unit Maintenance

## General

On initial start-up and periodically during operation, it will be necessary to perform certain routine service checks. Among these are checking the liquid line sight glasses, taking condensing and suction pressure readings, and checking to see that the unit has normal superheat and subcooling readings. A recommended maintenance schedule is located at the end of this section.

## Compressor Maintenance

The scroll compressors are fully hermetic and require no maintenance.

## Lubrication

No routine lubrication is required on AGZ units. The fan motor bearings are permanently lubricated and no further lubrication is required. Excessive fan motor bearing noise is an indication of a potential bearing failure.

Compressor oil should be standard refrigeration mineral oil such as Suniso 3GS.

## Electrical Terminals

**⚠ DANGER**

**Electric shock hazard. Disconnect all power before continuing with following service.**

## Condensers

The condensers are air-cooled and constructed of 3/8" (9.5mm) O.D. internally finned copper tubes, bonded in a staggered pattern into louvered aluminum fins. Maintenance consists of routine removal of dirt and debris from the outside surface of the fins. McQuay recommends the use of foaming coil cleaners available at most air conditioning supply outlets. Use caution when applying such cleaners as they can contain potentially harmful chemicals. Care should be taken not to damage the fins during cleaning. The coils should be thoroughly rinsed to remove any cleaner residue.

If the service technician determines that the refrigerant circuit contains noncondensables, recovery can be required, strictly following Clean Air Act regulations governing refrigerant discharge to the atmosphere. The Schrader purge valves are located on the vertical coil headers on both sides of the unit, at the end opposite from the control box. Decorative panels cover the coil headers and must be removed for servicing. Recover with the unit off, after a shutdown of 15 minutes or longer, to allow air to collect at the top of the coil. Restart and run the unit for a brief period. If necessary, shut unit off and repeat the procedure. Follow accepted environmentally sound practices when removing refrigerant from the unit.

## Refrigerant Sight Glass

The refrigerant sight glasses should be observed periodically. (A weekly observation should be adequate.) A clear glass of liquid indicates that there is normal subcooled refrigerant in the system. Bubbling refrigerant in the sight glass, during stable run conditions, indicates that the system can be short of refrigerant charge. Refrigerant gas flashing in the sight glass could also indicate an excessive pressure drop in the liquid line, possibly due to a clogged filter-drier or a restriction elsewhere in the liquid line. See Table 38 for maximum allowable pressure drops. If subcooling is low, add charge to clear the sight glass. If subcooling is normal (15 to 20 degrees F) and flashing is visible in the sight glass, check the pressure drop across the filter-drier. Subcooling should be checked at full load with at least 70°F (21.1°C) outdoor air temperature, stable conditions, and all fans running.

An element inside the sight glass indicates the moisture condition corresponding to a given element color. If the sight glass does not indicate a dry condition after about 12 hours of operation, the circuit should be pumped down and the filter-drier changed; or verify system condition by performing an acid test on the compressor oil.

## Preventive Maintenance Schedule

| OPERATION | WEEKLY | MONTHLY (Note 1) | ANNUAL (Note 2) |
|---|---|---|---|
| General | | | |
| Complete unit log and review (Note 3) | X | | |
| Visually inspect unit for loose or damaged components | | X | |
| Inspect thermal insulation for integrity | | | X |
| Clean and paint as required | | | X |
| | | | |
| Electrical | | | |
| Check terminals for tightness, tighten as necessary | | | X |
| Clean control panel interior | | | X |
| Visually inspect components for signs of overheating | | X | |
| Verify compressor heater operation | | X | |
| Test and calibrate equipment protection and operating controls | | | X |
| Megger compressor motor ***** | | | X |
| | | | |
| Refrigeration | | | |
| Leak test | | X | |
| Check sight glasses for clear flow | X | | |
| Check filter-drier pressure drop (see manual for spec) | | X | |
| Perform compressor vibration test | | | X |
| Acid test oil sample | | | X |
| | | | |
| Condenser (air-cooled) | | | |
| Clean condenser coils (Note 4) | | | X |
| Check fan blades for tightness on shaft (Note 5) | | | X |
| Check fans for loose rivets and cracks | | | X |
| Check coil fins for damage | | | X |

**Notes:**

1. Monthly operations include all weekly operations.
2. Annual (or spring start-up) operations includes all weekly and monthly operations.
3. Log readings can be taken daily for a higher level of unit observation.
4. Coil cleaning can be required more frequently in areas with a high level of airborne particles.
5. Be sure fan motors are electrically locked out.

*** Never Megger motors while they are in a vacuum.**

**CAUTION**

**Service on this equipment is to be performed by qualified refrigeration personnel familiar with equipment operation, maintenance, correct servicing procedures, and the safety hazards inherent in this work. Causes for repeated tripping of equipment protection controls must be investigated and corrected. Disconnect all power before doing any service inside the unit. Anyone servicing this equipment shall comply with the requirements set forth by the EPA in regards to refrigerant reclamation and venting.**

### Filter-Driers

A replacement of the filter-drier is recommended any time excessive pressure drop is read across the filter-drier and/or when bubbles occur in the sight glass with normal subcooling. The maximum recommended pressure drop across the filter-drier is as follows:

***Table 38, Filter-Drier Pressure Drop***

| PERCENT CIRCUIT LOADING (%) | MAXIMUM RECOMMENDED PRESSURE DROP ACROSS FILTER-DRIER PSIG (KPA) |
|---|---|
| 100% | 10 (69) |
| 75% | 8 (55.2) |
| 50% | 5 (34.5) |
| 25% | 4 (27.6) |

The filter-drier should also be changed if the moisture indicating liquid line sight glass shows excess moisture in the system.

During the first few months of operation, filter-drier replacement can be necessary if the pressure drop across the filter-drier exceeds the values listed in the paragraph above. Any residual particles from the condenser tubing, compressor and miscellaneous components are swept by the refrigerant into the liquid line and are caught by the filter-drier.

## Liquid Line Solenoid Valve

The liquid line solenoid valves that shut off refrigerant flow in the event of a power failure do not normally require any maintenance. The solenoids can, however, require replacement of the solenoid coil or of the entire valve assembly.

The solenoid coil can be checked to see that the stem is magnetized when energized by touching a screwdriver to the top of the stem. If there is no magnetization, either the coil is bad or there is no power to the coil.

The solenoid coil can be removed from the valve body without opening the refrigerant piping after pumpdown. Shut off and lock-out the unit power.

The coil can then be removed from the valve body by simply removing a nut or snap-ring located at the top of the coil. The coil can then be slipped off its mounting stud for replacement.

To replace the entire solenoid valve follow the steps involved when changing a filter-drier.

# Remote Evaporator (AGZ-BM Only)

The evaporator is the direct expansion, shell-and-tube type with refrigerant flowing through the tubes and water flowing through the shell over the tubes. The tubes are internally finned to provide extended surface as well as turbulent flow of refrigeration through the tubes. Models AGZ 070BM or smaller have a stainless steel brazed-plate type evaporator. Other than cleaning and testing, no service work should be required on the evaporator.

# Refrigerant Charging

Units are shipped with a holding charge of refrigerant and the system must be charged at the job site. Follow these recommendations when field charging. Refer to the unit operating charge found in the Physical Data Tables.

Unit charging can be done at any steady load condition (preferably at 75 to 100% load), and at any outdoor temperature (preferably higher than 70°F (21.1°C). Unit must be allowed to run 5 minutes or longer so that the condenser fan staging is stabilized at normal operating discharge pressure. For best results charge with two or more condenser fans operating on each refrigerant circuit.

The ACZ/AGZ units have a condenser coil design with approximately 15% of the coil tubes located in a subcooler section of the coil. This results in liquid cooling to within 5°F (3°C) of the outdoor air temperature when all condenser fans are operating. This is equal to about 15°F-20°F (8.3°C-11.1°C) subcooling below the saturated condensing temperature when the pressure is read at the liquid valve between the condenser coil and the liquid line filter-drier. Once the subcooler is filled, extra charge will not lower the liquid temperature and does not help system capacity or efficiency.

**One of the following three scenarios will be experienced with an undercharged unit:**

1. If the unit is slightly undercharged, the unit will show bubbles in the sight glass. Recharge the unit as described in the charging procedure below.
2. .If the unit is moderately undercharged, it will normally trip on freeze protection. Recharge the unit as described in the charging procedure below. However, freezestat trips can also be an indication of low flow or poor heat transfer in the system evaporator.
3. If the unit is severely undercharged, the unit will trip due to lack of liquid flow to the expansion valve. In this case, either remove the remaining charge by means of a proper reclamation system and recharge the unit with the proper amount of refrigerant as stamped on the unit nameplate, or add refrigerant through the suction valve on the compressor. If the unit is severely undercharged, the unit can nuisance trip during this charging procedure. If this happens, operate the unit at minimum load, adding charge until the sight glass is clear. Once the unit has enough charge so that it does not trip out, continue with step 2 of the charging procedure below.

**Procedure to charge a moderately undercharged ACZ/AGZ unit:**

1. If a unit is low on refrigerant, you must first determine the cause before attempting to recharge the unit. Locate and repair any refrigerant leak. Evidence of oil is a good indicator of leakage, however, oil can not be visible at all leaks. Liquid leak detector fluids work well to show bubbles at medium sized leaks, but electronic leak detectors can be needed to locate small leaks.
2. Add the charge to the system through the suction shutoff valve or through the Schrader fitting on the tube entering the evaporator between the compressor and the evaporator head.
3. The charge can be added at any load condition between 25-100% load per circuit but at least two fans should be operating per refrigerant circuit if possible. The suction superheat should be in the 8 to 12 degree F (4.4°C - 6.6°C) range.
4. Add sufficient charge to clear the liquid line sight glass and until all flashing stops in the sight glass.

5. Check the unit subcooling value by reading the liquid line pressure and temperature at the liquid line near the filter-drier. The subcooling values should be between 15 and 20 degrees F (8.3 and 11.1 degrees C).
6. With outdoor temperatures above 60°F (15.6°C) all condenser fans should be operating and the liquid line temperature should be within 5°F-10°F (2.8°C-5.6°C) of the outdoor air temperature. At 25-50% load the liquid line temperature should be within 5°F (2.8°C) of outdoor air temperature with all fans on. At 75-100% load the liquid line temperature should be within 10°F (5.6°C) of outdoor air temperature with all fans on.
7. Overcharging of refrigerant will raise the compressor discharge pressure due to filling of the condenser tubes with excess refrigerant.

# Warranty Statement

### Limited Warranty

Consult your local McQuay Representative for warranty details. Refer to Form 933-43285Y. To find your local McQuay Representative, go to www.mcquay.com.

# ACZ/AGZ Troubleshooting Chart

| PROBLEM | POSSIBLE CAUSES | POSSIBLE CORRECTIVE STEPS |
|---|---|---|
| **Compressor Will Not Run** | 1. Main Switch.<br>2. Fuse Blown. Circuit breakers open<br>3. Thermal overloads tripped<br>4. Defective contactor or coil.<br>5. System Shutdown by equipment protection devices<br>6. No cooling required<br>7. Liquid line solenoid will not open<br>8. Motor electrical trouble<br>9. Loose wiring | 1. Close Switch.<br>2. Check electrical circuits and motor windings for shorts or grounds. Investigate for possible overloading. Replace fuse or reset breakers after fault is corrected. Check for loose or corroded connections.<br>3. Overloads are auto-reset Check unit closely when unit comes back on line. Allow time for auto-reset.<br>4. Repair or replace<br>5. Determine type and cause of shutdown and correct it before resetting equipment protection switch<br>6. None. Wait until unit class for cooling<br>7. Repair or replace solenoid coil. Check wiring<br>8. Check motor for opens, shorts, or burnout<br>9. Check all wire junctions. Tighten all terminal screws |
| **Compressor Noisy Or Vibrating** | 1. Low or no refrigerant charge<br>2. Compressor running in reverse<br>3. Improper piping support on suction or discharge<br>4. Worn compressor isolator bushing<br>5. Worn Compressor | 1. Repair and recharge<br>2. Check unit and compressor for correct phasing<br>3. Relocate, add, or remove hangers<br>4. Replace<br>5. Replace |
| **High Discharge Pressure** | 1. Noncondensables in system<br>2. System overcharged with refrigerant<br>3. Optional discharge shutoff valve partially closed<br>4. FanTrol wiring not correct<br>5. Fan not running<br>6. Dirty condenser coil<br>7. Air recirculation | 1. Extract the noncondensables with approved procedures<br>2. Remove excess, check liquid subcooling<br>3. Open valve<br>4. Check FanTrol wiring<br>5. Check electrical circuit, Check fan motor<br>6. Clean coil<br>7. Correct |
| **Low Discharge Pressure** | 1. Refrigerant flood back<br>2. Wind blowing into coil at low ambient<br>3. Faulty condenser temperature regulation<br>4. Insufficient refrigerant in system<br>5. Low suction pressure<br>6. Only one compressor operating | 1. Correct<br>2. Shield coil from direct wind<br>3. Check condenser control operation<br>4. Check for leaks. Repair and add charge<br>5. See corrective steps for Low Suction Pressure<br>6. See corrective steps for Compressor Will Not Stage Up |
| **High Suction Pressure** | 1. Excessive water temperature<br>2. Excessive load<br>3. Expansion valve overfeeding<br>4. Compressors running in reverse | 1. Check control settings<br>2. Reduce load or add additional equipment<br>3. Check remote bulb. Regulate superheat<br>4. Check for proper phasing |
| **Low Suction Pressure** | 1. Rapid load swings<br>2. Lack of refrigerant<br>3. Clogged liquid line filter-drier<br>4. Expansion valve malfunctioning<br>5. Condensing temperature to low<br>6. Compressor will not unload<br>7. Insufficient water flow<br>8. Evaporator head ring gasket slippage<br>9. Evaporator dirty<br>10. Rapid load swings | 1. Stabilize load<br>2. Check for leaks, repair, add charge. Check liquid sight glass<br>3. Check pressure drop across filter-drier. Replace<br>4. Check and reset for proper superheat<br>5. Check means for regulating condenser temperature<br>6. See corrective steps for Compressor Staging Intervals Too Low<br>7. Adjust flow<br>8. Take pressure drop across vessel and contact factory to obtain design pressure drop for that vessel<br>9. Clean chemically<br>10. Stabilize load |

Continued next page.

| PROBLEM | POSSIBLE CAUSES | POSSIBLE CORRECTIVE STEPS |
|---|---|---|
| **Compressor Will Not Stage Up** | 1. Defective capacity control<br>2. Faulty thermostat stage or broken wire<br>3. Stages not set for application | 1. Replace<br>2. Replace<br>3. Reset thermostat setting for application |
| **Compressor Staging Intervals Too Short** | 1. Thermostat control band not set properly<br>2. Erratic water thermostat<br>3. Insufficient water flow<br>4. Rapid load swings | 1. Set control band wider<br>2. Replace<br>3. Adjust flow<br>4. Stabilize load |
| **Compressor Oil Level Too High Or Too Low** | 1. Oil hang-up in piping<br>2. Low oil level<br>3. Loose fitting on oil line<br>4. Level too high<br>5. Insufficient water flow - Level too high<br>6. Excessive liquid in crankcase - Level too high<br>7. Short cycling | 1. Review refrigerant piping and correct<br>2. Check and add oil<br>3. Check and tighten system<br>4. Adjust thermal expansion valve<br>5. Adjust flow<br>6. Check crankcase heater. Reset expansion valve for higher superheat. Check liquid line solenoid valve operation.<br>7. Stabilize load or increase staging interval |
| **Compressor Loses Oil** | 1. Lack of refrigerant<br>2. Excessive compression ring blow-by<br>3. Suction superheat too high<br>4. Crankcase heater burnout | 1. Check for leaks and repair. Add refrigerant<br>2. Replace compressor<br>3. Adjust superheat<br>4. Replace crankcase heater |
| **Motor Overload Relays Or Circuit Breakers Open** | 1. Low voltage during high load conditions<br>2. Defective or grounded wiring in motor<br>3. Loose power wiring or burnt contactors<br>4. High condenser temperature<br>5. Power line fault causing unbalanced voltage | 1. Check supply voltage for excessive line drop<br>2. Replace compressor motor<br>3. Check all connections and tighten<br>4. See corrective steps for High Discharge Pressure<br>5. Check supply voltage. Notify power company. Do not start until fault is corrected. |
| **Compressor Thermal Protection Switch Open** | 1. Operating beyond design conditions<br>2. Discharge valve partially shut<br>3. Blown compressor internal gasket<br>4. Voltage range or imbalance<br>5. High superheat<br>6. Compressor bearing failure | 1. Add facilities so conditions are within allowable limits<br>2. Open valve<br>3. Replace gasket<br>4. Check and correct<br>5. Adjust to correct superheat<br>6. Replace compressor |

This document contains the most current product information as of this printing. For the most up-to-date product information, please go to **www.mcquay.com.**