Catalog

CAT AGZC

Air-Cooled Scroll Compressor Chiller

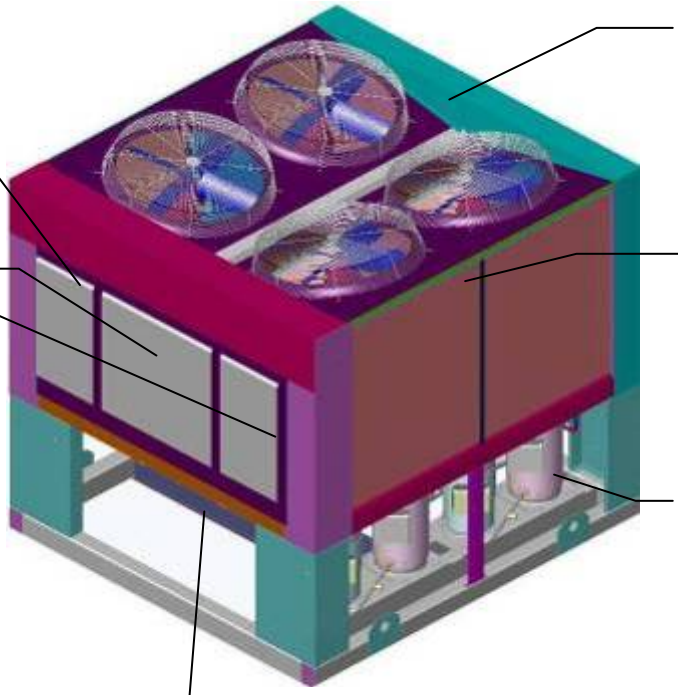
AGZ 030CH – AGZ 180CH, Packaged Chiller
AGZ 030CB – AGZ 180CB, Chiller with Remote Evaporator
30 to 180 tons
60 Hertz, R-410A

McQuay Air Conditioning

Engineered for flexibility and performance. ™

Model AGZ 030C through AGZ 180C Two-Circuit Chiller

(4-Fan Model Illustrated)



Canted Fan Deck
- Improved Efficiency
- Reduced Recirculation

Control Panel

Power Panels

"W" Shaped Coil
- High Efficiency
- Service Headroom

4 or 6 Scroll Compressors
- Low Sound Levels
- High Efficiency
- Two Refrigerant Circuits

Brazed-Plate Evaporator on 30-100 Tons
Shell-and-Tube Evaporator on 110-180 tons
- Efficient
- Compact

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Cover Picture: Model AGZ 180C, nominal 180-ton capacity, shown with optional coil louvers installed.

Table of Contents

*Unit Controllers are LONMARK certified with an optional LONWORKS communication module

Manufactured in an ISO certified facility

Introduction

The AGZ-C family of air-cooled scroll chillers offers a wide selection of units from 30 to 180 tons with dual refrigerant circuits and either two or three scroll compressors per circuit. Remote evaporators are available as an option.

The AGZ series of air-cooled scroll chillers continues McQuay's legacy of high quality, high efficiency, latest technology and quiet operation. These features make the AGZ family the best overall value in air-cooled packaged chillers available today.

Efficient Operation

The AGZ units utilize environmentally acceptable R-410A refrigerant and meet the performance requirements of ASHRAE Standard 90.1 for efficiency. With either two or three scroll compressors per refrigerant circuit, excellent part-load performance is achieved.

Latest Control Technology

These units have the latest control technology through utilization of McQuay's MicroTech II® microprocessor. Integrating with your building automation system is easy with the Open Choice™ feature using LonTalk®, BACnet® or Modbus® network communication, requiring only the factory or field mounting of a small communication module to the unit controller.

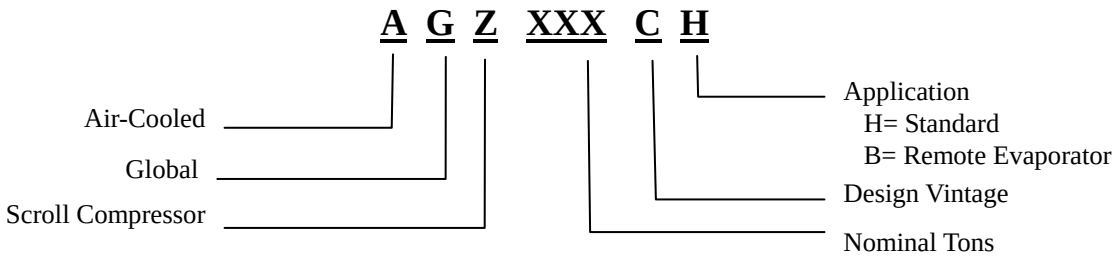
Compact Size

Our reputation for compact designs with small footprints to minimize space requirements continues to be a primary feature.

Quiet Operation

The AGZ units further enhance McQuay's reputation for low operating sound levels to make these chillers "neighborhood friendly".

Nomenclature



HAZARD IDENTIFICATION INFORMATION

⚠ DANGER

Dangers indicate a hazardous situation which will result in death or serious injury if not avoided.

⚠ WARNING

Warnings indicate potentially hazardous situations, which can result in property damage, severe personal injury, or death if not avoided.

⚠ CAUTION

Cautions indicate potentially hazardous situations, which can result in personal injury or equipment damage if not avoided.

Features and Benefits

AGZ-C Chillers
Dual Circuits, 30 - 180 Tons

The AGZ-C units with dual refrigerant circuits from 30 to 180 tons offer outstanding benefits that make this product effective for a variety of applications.

High Efficiency Full Load Operation = Lower Energy Costs for High Loads

Utilizing new R410A scroll compressor technology, the AGZ-C chillers meet or exceed the performance requirements of ASHRAE Standard 90.1. All system components are selected for optimum performance, including the large condenser coil areas and large evaporator sizes. Full load EER ranges from 9.6 to 10.3.

Excellent Part-load Performance = Lower Energy Costs Most of the Year

By using either four or six compressors on each chiller, unloading characteristics and part-load performance are outstanding. The IPLV part-load values for the scroll units range from 13.9 to 14.7 EER.

Integrated part-load value (IPLV) is a part-load performance indicator as outlined in ARI Standard 550/590-2003. The IPLV rating compares the performance of different chillers under identical conditions. When the IPLV is listed in EER (Energy Efficiency Ratio), a higher EER will indicate that the chiller's overall performance is better.

Compact Design & Small Footprint = Installation Flexibility and Lower Cost

McQuay AGZ-C series chillers have a reputation for a compact design and small footprint. A small footprint can save installation costs by minimizing the size of the concrete mounting pad or reduces the amount of structural steel if the unit is mounted on the roof.

"Neighborhood friendly" Quiet Operation = Installation Flexibility

The AGZ chillers are designed with quiet scroll compressors. Fans are selected for good performance and lower sound levels. The attention to detail with sound is critical in the design. Details such as refrigerant piping, supports for piping, securing components to the structure are all important to making a quiet product. We proudly publish our sound performance, starting on page 30.

MicroTech II® Superior Controls = Efficient, Reliable Operation

Once again, McQuay has provided the latest technology in controlling the AGZ-C chillers. The new MicroTech II controller provides a "user-friendly" environment for the operator. The control logic is designed to provide maximum efficiency, to help provide continuing operation in unusual operating conditions through proactive controls, and to provide a history of conditions to aid in problem resolution.

Perhaps the greatest benefit is McQuay's Open Choice™ feature for integrating with your building automation system (BAS). MicroTech II interfaces with the BAS using open-standard protocols through LonTalk® BACnet® or Modbus®. See the complete control description on page 9 in this catalog.

Compare with Screw Compressor Chillers

Why Is Compressor Type Important?

The important issues for selecting the best chiller are the tangible benefits that have a direct impact on the owner and installer. These benefits include full-load efficiency, part-load performance, quiet operation and cost. Other important issues include compact sizing for reduced installation costs, superior control with the latest control technology and the Open Choices™ feature for easy integration with a building automation system.

Superior Part-load Performance

Perhaps the biggest benefit of AGZ compared to a typical screw compressor chiller is part-load efficiency. Almost all operating hours are at part-load conditions. Our engineers have designed our AGZ scroll compressor chillers for best performance at reduced load conditions.

Our advantage is simple: the AGZ uses either four or six compressors. When reduced capacity is needed, compressors are cycled off to meet the load. Conversely, screw compressor chillers in this size range typically have only two compressors. A screw compressor relies on slide valves to reduce its capacity to meet a part-load situation. Therefore, it is reasonable to expect the scroll compressor chiller with compressors cycled "off" to be more efficient at part-load than a large screw compressor operating unloaded. (Refer to the IPLV discussion on the 'Features and Benefits' page for part-load efficiency comparisons. The AGZ-B offers superior part-load performance compared to equally-sized screw chillers.

High Efficiency Operation

Due to the optimized selection of chiller components and the large condenser coils, the full load efficiency for AGZ-C is comparable to the full load performance of other screw compressor chillers. One must remember that very few operating hours are typically at full load. The ARI Standard 550/590-1998 recognizes full load operation as ONLY 1% of the operating hours.

Quiet Operation – Neighborhood friendly

McQuay's single main rotor screw compressor design has a widely acknowledged reputation for quiet operation. In contrast, dual-rotor screw compressors offered by others are notoriously noisy. The AGZ-C sound levels are low and sound data is proudly displayed in this catalog, beginning on page 30. Except for McQuay's screw chiller designs, it is difficult to find published sound data from other manufacturers for their air-cooled chillers.

Lower installation costs - Compact design and small footprint

The AGZ-C chillers are generally smaller than comparable screw chillers. The AGZ-C's small footprint allows for smaller mounting pads and structural steel for roof mounting applications that can reduce installation costs.

Superior Control

The AGZ-C control system utilizing the MicroTech II controller has the control functions expected of the most sophisticated screw chillers. Integrating a BAS system with AGZ-C chillers is more flexible than most screw chiller packages, with a choice of open standard protocols including LonTalk, BACnet or Modbus. Refer to page 10 for a complete description of the control capabilities and benefits.

Simplicity & Lower Maintenance Costs

Lower maintenance cost for the AGZ unit is a result of the simple design. General Service Technicians can typically service the simple scroll compressors. Conversely, screw compressor chillers are complex and require highly trained service technicians for service and repair. Therefore, the owner can have lower maintenance cost with AGZ for the life of the unit.

Summary

The decision to use AGZ Scroll Chillers over screw compressor chillers in the 75 - 180 ton range should consider the aforementioned points. The AGZ provides great performance, leading technology, quiet operation, superior control and easy BAS integration. Installers appreciate the smaller footprints. All of these benefits are provided in a simple design with lower maintenance costs.

Design Features

McQuay AGZ Air-Cooled Chillers are a product of the McQuay commitment to offer quiet, reliable, energy efficient equipment--an approach incorporating high quality compressors, state-of-the-art coil design, and innovative packaging.

Construction

AGZ chillers are factory-assembled and mounted on a heavy-gauge steel base. The base rails, supports and cabinetry are powder-coat painted. The base distributes the unit weight for roof loading. Varied and convenient installation is made possible by virtue of the unit's small footprint.

Compressors

Copeland's Compliant Scroll® tandem or triple compressors are used. These rugged hermetic compressors are constructed with an integral cast iron frame, cast iron scrolls, three Teflon® impregnated bearings, and three oil filtration devices for each compressor.

Using Copeland's Compliant Scroll tandems and triples provides four to six steps of capacity modulation depending on model size. One to six compressors can run, depending on the load of the system, resulting in excellent part-load efficiency. Each refrigerant circuit has specially designed oil and gas equalization lines to control oil migration.

The design also offers radial and axial compliance (no tip seals), a large internal volume for liquid handling, a removable suction screen, and a rotary dirt trap and oil screen. In addition, the compressor is self-compensating for wear, handles moderate liquid slugging, and inherently yields high efficiency.

This well protected compressor includes a solid-state motor protection module, 4 individual motor-winding sensors, a patented internal discharge temperature probe, and a patented shutdown feature that prevents reverse rotation. An internal discharge check valve helps prevent shutdown noise and comes standard with high and low pressure taps with Schrader valves, a sight glass, an oil level adjustment valve, and an off cycle crankcase heater.

Units are available in 60 Hertz with voltage configurations from 208 to 575 volts (depending on size), operating at 3550 rpm.

Condenser Coils

Condenser coils have internally enhanced seamless copper tubes arranged in a staggered row pattern. The coils are mechanically expanded into McQuay lanced and rippled aluminum fins with full fin collars. A variety of optional coil material and coatings are available for corrosive atmospheres, including copper fins, black fin and *ElectroFin*® coating; see page 87 for description of options. An integral subcooler circuit provides subcooling to greatly reduce the possibility of liquid flashing. The external condenser coils are fitted with a protective wire mesh guard.

Condenser Fans and Motors

Multiple direct drive dynamically balanced propeller fans operate in formed venturi openings at low tip speeds for maximum efficiency and minimum noise and vibration. A heavy-gauge vinyl-coated fan guard protects each fan.

Each condenser fan motor (including the optional VFD fan motor) is Totally Enclosed Air Over (TEAO), heavy-duty, 3-phase with permanently lubricated ball bearings and inherent overload protection.

Figure 1- AGZ 130C with Optional Full Louver Package

Evaporator

Models AGZ-030 through -130

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 combination provides freeze protection down to -20° F (-29° C) ambient air temperature. The suction line is insulated from the evaporator to the split at the compressors.

The water side working pressure is 653 psig (4502 kPa). Evaporators are designed and constructed according to, and listed by, Underwriters Laboratories (UL).

Models AGZ-140 through -180

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.

Refrigerant heads are carbon steel with multi-pass baffles to provide oil return and are removable to permit access to the tubes from either end. For water removal, 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 ºF at 75° F.

The refrigerant (tube) side maximum working pressure is 450 psig (3103 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.

On Model AGZ-CB units the evaporator is shipped separately for field mounting and piping to the outdoor unit. The refrigeration piping specialties shown in Figure 2 are furnished by McQuay and installed by the installing contractor.

⚠ CAUTION

A water flow switch, or both water flow switch and water pump starter interlock, must be field installed and wired to protect against serious equipment damage from evaporator freeze-up under low water flow conditions.

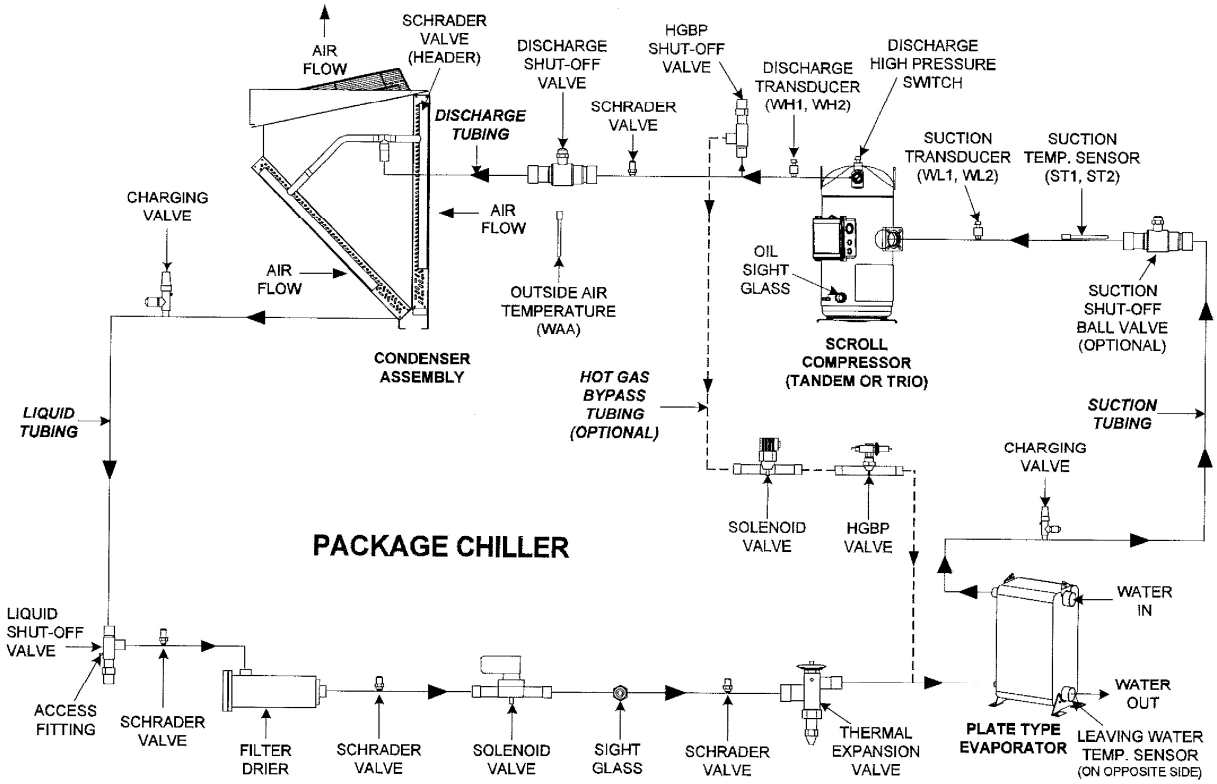
Piping, Valves, and Specialties

Table 1, Piping Components Availability

UNIT	Liquid Line Shut-off	Discharge Shut-off	Suction Shut-off	Hot Gas Bypass & Shut-of Valves	LLSV, SG, TXV, F-D	
					Supplied By	Installed By
AGZ-C, Packaged	Standard	Optional	Optional	Opt. (Factory Mtd).	McQuay	McQuay
AGZ-CB, Remote Evaporator	Standard	Not Avail.	Standard	Opt. (Factory Mtd).	McQuay	Others

NOTE: LLSV=Liquid Line Solenoid Valve, SG=Sight Glass, TXV=Thermo-Expansion Valve, F-D=Filter-Drier

Figure 2, AGZ-CB, Package Unit Piping Schematic (one circuit shown)



NOTES:
1. Evaporator is brazed-plate on AGZ 030–130 and shell-and-tube on AGZ 140-180.
2. Hot gas bypass is an option. The controls are factory installed and field piping is required.
3. The filter, solenoid valve, sight glass, and expansion valve must be located as close as possible to the evaporator.

Electrical Control Center

Operating and equipment protection controls and motor starting components are separately housed in a centrally located, weather resistant control panel with hinged and tool-locked doors. In addition to the MicroTech II controller described in the next sections, the following components are housed in the panel:

- Power terminal block, single point connection standard
- Control, input, and output terminal block
- Control transformer
- Optional disconnect switch with through-the-door handle
- Compressor motor inherent thermal and overload protection is standard.
- Optional phase voltage monitor with under/over voltage and phase reversal protection.
- Fan contactors with short circuit protective devices.
- Optional ground fault protection.
- The standard FanTrol® head pressure control system controls fan staging for control of refrigerant discharge pressure. The FanTrol system cycles condenser fans based on discharge pressure and outdoor temperature and is designed for operation down to 35° F (1.7° C). An optional fan VFD for operation between 35ºF and 0ºF (1.7ºC and -18ºC) is available.
- Mechanical high pressure cutout
- Power connections are per the following table:

Table 2, Power Connections

Power Connection	Power Block	Disc. Swt.	Comp Circuit Breakers	Circuit Breakers w/ High Interr. Capacity	Panel High Short Circuit Current Rating
AGZ 030-180, Single Point, (Opt)	Std	Opt.	Std	Opt.	Opt
AGZ 030-180, Multi-Point, (Std.)	Std	Opt.	Not Avail.	Opt.	Opt.

Definitions:

1. **Power Block**, An electrical device to directly accept field wiring without any disconnecting means.
2. **Disconnect Switch,** A molded case switch that accepts field wiring and disconnects main power to the entire unit or each main power supply if the multi-point power supply option is selected. This option does not provide overcurrent protection.
3. **Compressor Circuit Breakers,** A manually reset circuit breaker for each compressor, providing compressor only protection and located ahead of the contactor. Provides overcurrent protection for each compressor.
4. **Disconnect Switch with High Interrupting Capacity,** A molded case switch with high short circuit current rating with one circuit breaker provided with each electrical circuit. The circuit breaker provides overcurrent protection for each power supply.
5. **Control Panel High Short Circuit Current Rating,** (Previously known as "withstand rating"). The entire control panel is designed for short circuit current rating as shown on page 88. In the event of a short circuit, the damage is contained within the control panel enclosure.

Control System

The MicroTech II advanced DDC chiller controller surpasses all other microprocessor-based chiller control systems available today. This powerful, user-friendly control system provides the flexibility and performance needed for either stand-alone unit operation or the controller can be easily tied into your building automation system of choice using McQuay's Open Choices feature. Open Choices allows you to choose from open standard protocols such as BACnet®, Modbus® and LonTalk® to communicate easily with the building automation system that best meets your facility requirements. These optional communications modules are available factory installed or can be easily field installed.

MicroTech II control's state-of-the-art design will not only permit the chiller to run more efficiently, but will also simplify troubleshooting if a system failure occurs. Every MicroTech II controller is programmed and tested prior to shipment to help provide a trouble-free start-up.

Operator-friendly

The MicroTech II control menu structure is separated into four distinct categories that provide the operator or service technician with a full description of current unit status, control parameters, and alarms. Security protection helps prevent unauthorized changing of the setpoints and unit control parameters.

MicroTech II control continuously performs important self-diagnostic checks while monitoring system temperatures, pressures and protection devices. It will automatically shutdown a compressor, a refrigerant circuit or the entire unit if a fault occurs. The cause of the shutdown will be retained in memory and can be easily displayed in plain English or metric units for operator review. The MicroTech II chiller controller can also retain and display the time the fault occurred and the operating conditions that were present at the time of the fault, which is an extremely useful feature for troubleshooting. In addition to displaying alarm diagnostics, the MicroTech II chiller controller also provides the operator with a warning of pre-alarm conditions. Alarm notification data can also be passed to your BAS through an optional communications module.

Staging

The scroll compressors are staged on and off as a function of leaving chilled water temperature. Lead/lag is automatic and switched based on starts and operating hours.

Equipment Protection

The unit is protected in two ways: (1) by alarms that shut the unit down and require manual reset to restore unit operation and (2) by limit alarms that reduce unit operation in response to some out-of-limit condition. Shut down alarms activate an alarm signal that can be exported to a remote location. Limit alarms activate a light on the controller and do not trigger a remote alarm.

Shutdown Type Alarms

- No evaporator water flow
- Low evaporator pressure
- High condenser pressure
- Motor protection system
- Ground fault protection
- Sensor failures
- Phase voltage protection
- Evaporator freeze protection
- Outside ambient temperature

Limit Type Alarms

- Condenser pressure stage down, unloads unit at high discharge pressures
- Low ambient lockout, shuts off unit at low ambient temperatures
- Low evaporator pressure hold, holds stage #1 until pressure rises
- Low evaporator pressure unload, shuts off stage #2

Unit Enable Selection

Enables unit operation from either local keypad, digital input, or BAS

Unit Mode Selection

Selects standard cooling, ice, glycol, or test operation mode

Analog Inputs

Reset leaving water temperature, 4-20 mA

Demand limit

Digital Inputs

- Unit off switch
- Remote start/stop
- Flow switch
- Ice mode switch, converts control operation and setpoints for ice production
- Motor protection

Digital Outputs

Shutdown alarm; field wired, activates on an alarm condition, off when alarm is cleared

Evaporator pump; field wired, starts pump when unit is set to start

Condenser fan control

The MicroTech II controller provides control of the condenser fans. The controller steps condenser fans based on discharge pressure.

Building Automation System (BAS) Interface

The following BAS protocols are supported:

BACnet/IP
BACnet MS/TP
BACnet Ethernet
LonTalk (FTT-10A)
Modbus

The following functions are generally available depending on the application and protocol in use:

Enable/disable operation

Describe each alarm when it occurs

Select operating mode

Set chilled water setpoint

Set the network limit variable

Read operating mode and status

Read digital and analog inputs and outputs

Keypad/Display

A 4-line-by-20-character/line liquid crystal display and 6-key keypad is mounted on the unit controller. Its layout is shown below.

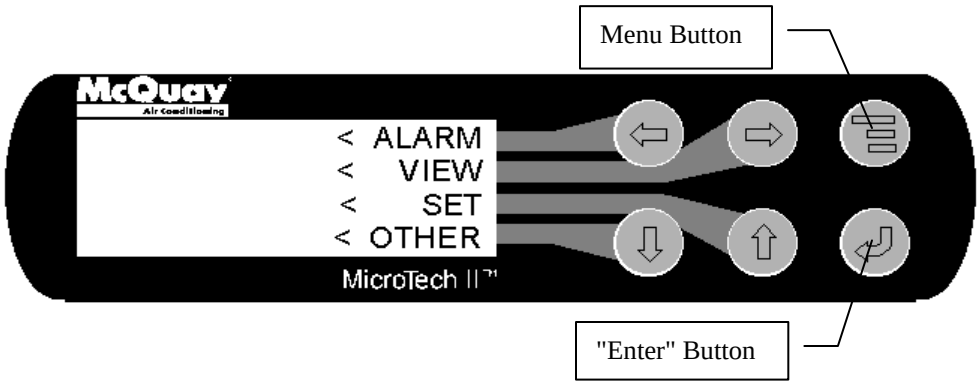


Figure 3, AGZ-C Control Panel and Power Panel

Optional Remote Interface Panel

In addition to the unit-mounted user interface provided with MicroTech II controls, the AGZ chillers can be individually equipped with a remote user interface. It provides convenient access to unit diagnostics and control adjustments, without having to access a rooftop or outdoor location. A separate remote panel is required for each chiller on a job site.

Each remote user interface is similar to its unit-mounted counterpart and offers the same functionality, including:

- Touch-sensitive keypad with a 4 line by 20-character display format.
- Digital display of messages in English language.
- All operating conditions, system alarms, control parameters and schedules are monitored.

Features

- Can be wired up to 1,640 feet (500 meters) from the unit for flexibility in placing each remote user interface within your building.

- The main control is isolated from the remote user interface wiring so that wiring problems are less likely to damage the unit user interface.

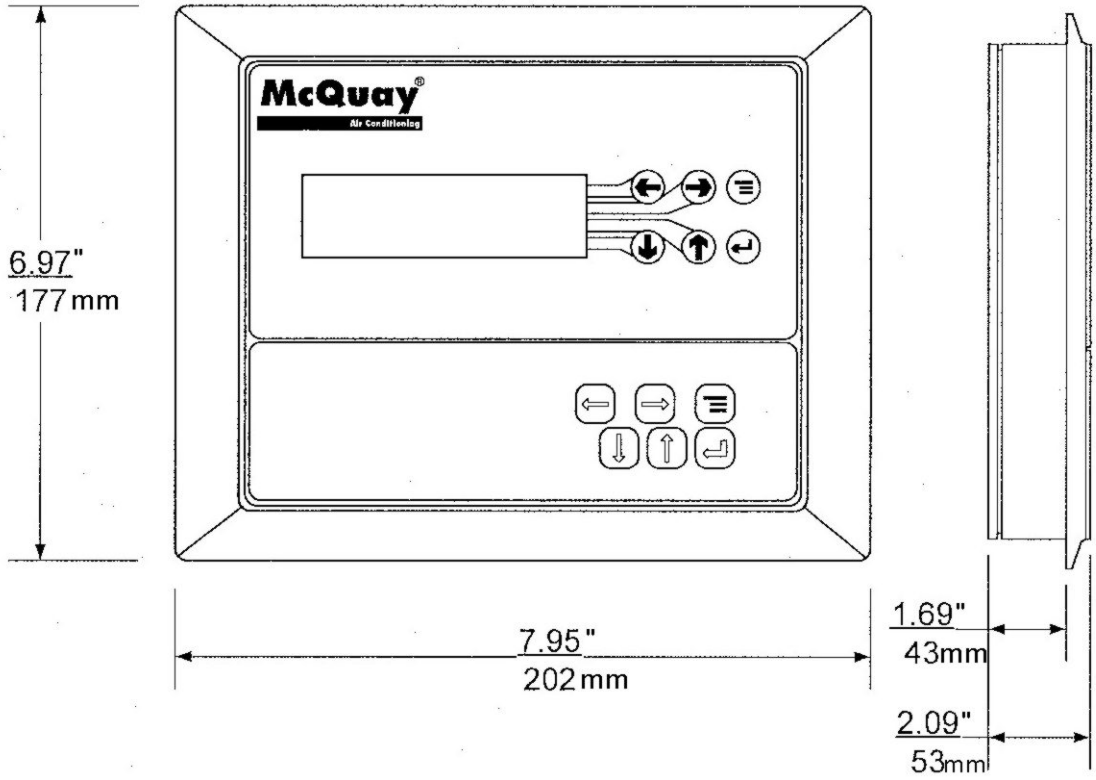
Benefits

- Allows you to access the user interface for each unit from one location, inside the building.
- Users need to learn one format because the remote user interface is identical to the unit-mounted version.
- No additional field commissioning is required for the remote user interface.
- Can be retrofit after unit installation.
- Is fully compatible with the optional BAS communication modules.

Cable and Wiring Recommendations

No more than 1,640 feet (500 meters) of wiring can be used to connect the remote user interface to the unit. Power: AWG 22 twisted pair cable. Communications: Belden 9841 or equal AWG 22 twisted pair. See McQuay manual *IOM MT II Remote Panel* for wiring and installation information.

Figure 4, Remote Interface Panel Dimensions



Selection Procedure

Packaged Chiller

Inch-Pound (I-P) units

Table 14 on page 21 covers the range of leaving evaporator water temperatures and outside ambient temperatures included under ARI 550/590-2003. The tables are based on a 10 degree F (5.5 degree C) temperature drop through the evaporator. Adjustment factors for applications having other than a 10 degree F (5.5 degree C) drop can be found in Table 7 or Table 8. The minimum leaving chilled water temperature setpoint without glycol is 40° F (4ºC). For brine selections, see Table 3 through Table 6 for glycol adjustment factors. Ratings are based on a 0.0001 ft^2 x hr x ºF/Btu fouling factor in the evaporator at sea level operation. For other fouling factors, different Delta-Ts, or altitude correction factors see Table 7 or Table 8. For applications outside the catalog ratings, please contact your local McQuay sales representative.

Selection example

Given:
50 tons minimum
95° F ambient temperature
120 gpm, 54ºF to 44° F chilled water
0.0001 evaporator fouling factor

1. From Table 14, an AGZ 055C at the given conditions will produce 51.4 tons with a unit kW input of 62.9 and a unit EER of 9.8.
2. Use the following formula to calculate any unknown elements.

$$\frac{tons \times 24}{°F} = \text{gpm} \qquad \text{(water only)}$$

3. Determine the evaporator pressure drop. Using Figure 8, enter at 120 gpm and follow up to the AGZ 055B line intersect. Read horizontally to obtain an evaporator pressure drop of 11.4 feet of water.

Selection example using ethylene glycol

Given:
44 tons minimum
95° F ambient air temperature
54° F - 44° F chilled water temperature
0.0001 evaporator fouling factor
Protect from freezing down to 0° F

1. From Table 3, select an ethylene glycol concentration of 40% to protect against freezing at 0° F.
2. At 40% ethylene glycol, the adjustment factors are: Capacity = 0.980, kW = 0.992,
3. GPM = 1.132, Pressure Drop = 1.557
4. Select the AGZ 050C from Table 14 and correct with 40% ethylene glycol factors.
5. Correct capacity = 0.980 X 47.6 tons = 46.6 tons.
6. Correct compressor kW = 0.992 X 56.6 kW = 56.1 kW
7. Calculate chilled water flow:

$$\text{Water flow (at corrected capacity)} = \frac{46.6\,tons \times 24}{10°F} = 111.8\ \text{gpm}$$

Glycol flow (at 40% solution) = 1.132 X 111.8 gpm = 126.6 gpm
Determine the evaporator pressure drop. Using Figure 8, enter at 111.8 gpm (water) and follow up to the AGZ 050B line intersect. Read horizontally to obtain an evaporator pressure drop of 11.5 feet. Correct the pressure drop for 40% solution = 1.557 x 11.5 feet = 17.9 feet for ethylene glycol.

Selection with SI units

Use the SI tables and the same procedures as with I-P units. Use the following formula to calculate any missing elements (water only):
kW/4.18 x Delta-T degrees C = L/s

Remote Evaporator (AGZ-CB)

Inch-Pound (I-P) Units

Since the AGZ-CB remote evaporator units always include the same evaporator that the packaged arrangement does, the ratings are based on the packaged unit leaving chilled water temperature and ambient air temperature but with corrections for interconnecting refrigerant piping pressure drop.
Table 14 on page 21 covers the range of leaving evaporator water temperatures and outside ambient temperatures included under ARI 550/590-2003. The tables are based on a 10 degree F (5.5 degree C) temperature drop through the evaporator. Adjustment factors for applications having other than a 10 degree F (5.5 degree C) drop can be found in Table 7 or Table 8. The minimum leaving chilled water temperature setpoint without glycol is 40° F (4ºC). For brine selections, see Table 3 through Table 6 for glycol adjustment factors. Ratings are based on a 0.0001 ft^2 x hr x ºF/Btu fouling factor in the evaporator at sea level operation. For other fouling factors, different Delta-Ts, or altitude correction factors see Table 7 or Table 8. For applications outside the catalog ratings contact your local McQuay sales representative.
The length and configuration of the field installed interconnecting refrigerant piping will affect the

system capacity. Derates based on equivalent length of line are given in Table 13.

The steps for selecting an AGZ-CB are as follows:

1. Add 3% to the required cooling capacity (to approximate the effect of the correction factors to be determined) and make a preliminary unit selection from Table 14.
2. Divide the required capacity by the appropriate capacity correction factors: glycols from Table 3 through Table 6, altitude, chilled water Delta T, or fouling factor from or Table 8, and refrigerant piping derate from Table 13 as explained in step 3 below.
3. Determine the suction line size by first summing the equivalent feet (from Table 9) of all the fittings (use a sketch of the piping layout) and adding the sum of these fitting losses to the actual linear feet of tubing. This will equal the total equivalent feet. (To use the equivalent feet Table 9, start with the unit suction connection size from Table 12 and correct if required.)
4. If the unit rated capacity in the tables is less than the corrected required capacity, redo the selection with the next larger unit. In most cases the line size will be the unit connection size. If the selection is satisfactory, correct the power (if applicable) and determine water pressure drop.

Selection example, English Units

Given:
40 tons required capacity
95° F ambient temperature
Cool 100 gpm from 54ºF to 44° F
0.0001 evaporator fouling factor
2,000 foot altitude

1. Add 3% to the required capacity for the approximate derate: 40 x 1.03 = 41.2 tons. From Table 13 an AGZ-045C at the given conditions will produce 42.1 tons with a unit kW input of 50.5 and a unit EER of 10.0.
2. Determine derate factors:
   Altitude correction from Table 7:
   0.998 Capacity, 1.009 Power
3. Piping correction:
   Assume 1 5/8” suction line based on connection size in Table 11.

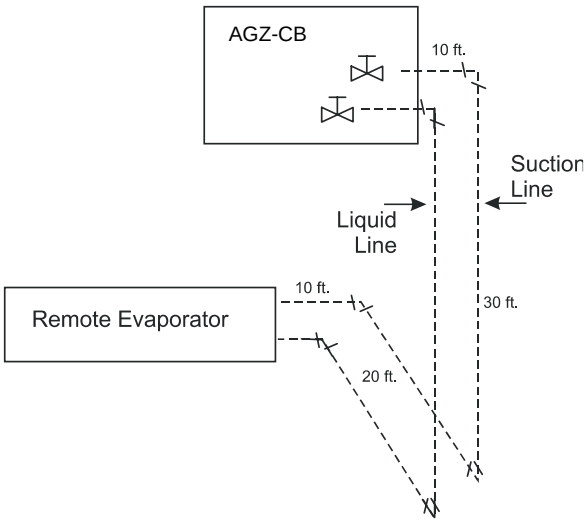
(3) 90º Standard ells	3 x 4 ft =12 ft
Plus actual linear feet	70 ft
Total Equivalent Feet	82 ft

1. Check
   Table 10 and find that 2 1/8” is maximum size for oil carry. This means that the 1 5/8” riser will be satisfactory.
   The capacity correction factor from Table 13 is 0.980.
4. The corrected capacity of the AGZ is: 42.1 tons x 0.998{altitude} x 0.98{piping} = 41.2 tons. This satisfies the 40 ton requirement.
5. Correct the unit power required: 50.5 kW x 1.009{altitude} = 51.0 kW.
6. Calculate the unit EER based on the correct capacity and power:
   EER = (41.2 tons x 12,000)/ (51.0 kW x 1,000) = 9.7
7. Determine the evaporator pressure drop. Enter the pressure drop curves (Table 9) at 100 gpm and read up to AGZ 045, read over to pressure drop of 10.2 ft.

Selection example, SI Units

The selection procedure for Metric units is identical to English, except that metric data and tables are used.

Figure 5, Sample Piping Layout



Application Adjustment Factors

NOTE: Due to different performance characteristics, the application factors shown in the following tables are separated into brazed-plate evaporators (Models AGZ 0030C through 100CB) and shell-and-tube evaporators (Models 130C through 180C).

Ethylene & Propylene Glycol Factors

AGZ units can operate with a leaving chilled fluid temperature range of 20° F (-6° C) to 60° F (10° C). A glycol solution is required when leaving chilled fluid temperature is below 40° F (4.6° C). The use of glycol will reduce the performance of the unit depending on concentration.

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 7.

Evaporator Temperature Drop Factors

Performance tables are based on a 10° F (5° C) temperature drop through the evaporator. Adjustment factors for applications with temperature ranges from 6° F to 16° F (3.3° C to 8.9° C) are in Table 7. Temperature drops outside this 6° F to 16° F (3.3° C to 8.9° C) range can affect the control system's capability to maintain acceptable control and are not recommended.

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

Table 3, Ethylene Glycol Factors for Models AGZ 030C to 100C

% 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 4, Propylene Glycol Factors for Models AGZ 030C to 100C

% 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

NOTE: Ethylene and propylene glycol ratings are outside the scope of ARI Standard 550/590-98 certification program.

Table 5, Ethylene Glycol Factors for Models AGZ 110C to 180C

% 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 6, Propylene Glycol Factors for Models AGZ 110C to 180C

% 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

NOTE: Ethylene and propylene glycol ratings are outside the scope of ARI Standard 550/590-98 certification program.

Fouling Factor

Performance tables are based (per ARI 550/590-98) on water with a fouling factor of:

$0.0001\,ft^2 \times hr \times °F / BTU \quad or \quad (0.0176 m^2 \times °C / kW)$

As fouling is increased, performance decreases. For performance at other than 0.0001 (0.0176) fouling factor refer to Table 7 or Table 8. 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 7, Capacity and Power Derates, Models AGZ 030 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	0.978	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

Table 8, Capacity and Power Derates, Models AGZ 140 to 180

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

Table 9, Equivalent Feet for Fittings

Fitting Type	7/8	1 1/8	1 3/8	1 5/8	2 1/8	2 5/8	3 1/8
Elbows							
90º Standard	2.0	2.6	3.3	4.0	5.0	6.0	7.5
90º Long Radius	1.4	1.7	2.3	2.6	3.3	4.1	5.0
90º Street	3.2	4.1	5.6	6.3	8.2	10	12
45º Standard	0.9	1.3	1.7	2.1	2.6	3.2	4.0
45º Street	1.5	2.1	3.0	3.4	4.5	5.2	6.4
180º Bend	3.2	4.1	5.6	6.3	8.2	10	12
Tees							
Full Size	1.4	1.7	2.3	2.6	3.3	4.1	5.0
Reducing	2.0	2.6	3.3	4.0	5.0	6.0	7.5
Valves							
Globe Valve, Open	22	29	38	43	55	69	84
Gate Valve, Open	0.9	1.0	1.5	1.8	2.3	2.8	3.2
Angle Valve, Open	9.0	12	15	18	24	29	35

Table 10, Maximum Line Size for Oil Carry Up a Suction Riser, R-410A

Unit Size	AGZ 030	AGZ 035	AGR 040	AGZ 045	AGZ 050	AGZ 055	AGZ 060	AGZ 065	AGZ 070	AGZ 075
Line Size	1 5/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8

Unit Size	AGZ 080	AGZ 090	AGZ 100	AGZ 110	AGZ 125	AGZ 130	AGZ 140	AGZ 160	AGZ 180
Line Size	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8

Table 11, Recommended Liquid Line Size, R-410A

Unit Model AGZ-CB	Connection Size At Unit	Recommended Liquid Line Size				
		Up to 50 Equiv. Ft	Up to 75 Equiv. Ft	Up to 100 Equiv. Ft	Up to 125 Equiv. Ft	Up to 150 Equiv. Ft
AGZ 030	7/8"	7/8 "	7/8 "	7/8 "	7/8 "	7/8 "
AGZ 035	7/8"	7/8 "	7/8 "	7/8 "	7/8 "	1 1/8 "
AGZ 040	7/8"	7/8 "	7/8 "	7/8 "	1 1/8 "	1 1/8 "
AGZ 045	7/8"	7/8 "	7/8 "	1 1/8 "	1 1/8 "	1 1/8 "
AGZ 050	7/8"	7/8 "	7/8 "	1 1/8 "	1 1/8 "	1 1/8 "
AGZ 055	7/8"	7/8 "	7/8 "	1 1/8 "	1 1/8 "	1 1/8 "
AGZ 060	7/8"	7/8 "	7/8 "	1 1/8 "	1 1/8 "	1 1/8 "
AGZ 065	7/8"	7/8 "	1 1/8 "	1 1/8 "	1 1/8 "	1 1/8 "
AGZ 070	7/8"	7/8 "	1 1/8 "	1 1/8 "	1 1/8 "	1 3/8"
AGZ 075	1 1/8"	1 1/8 "	1 1/8 "	1 1/8 "	1 3/8"	1 3/8"
AGZ 085	1 1/8"	1 1/8 "	1 1/8 "	1 3/8"	1 3/8"	1 3/8"
AGZ 090	1 1/8"	1 1/8 "	1 1/8 "	1 3/8"	1 3/8"	1 3/8"
AGZ 100	1 1/8"	1 1/8 "	1 1/8 "	1 3/8"	1 3/8"	1 3/8"
AGZ 110	1 1/8"	1 1/8 "	1 1/8 "	1 3/8"	1 3/8"	1 3/8"
AGZ 125	1 1/8"	1 1/8 "	1 3/8"	1 3/8"	1 3/8"	1 5/8"
AGZ 130	1 1/8"	1 1/8 "	1 3/8"	1 3/8"	1 3/8"	1 5/8"
AGZ 140	1 3/8"	1 3/8"	1 1/8 "	1 3/8"	1 5/8"	1 5/8"
AGZ 160	1 3/8"	1 3/8"	1 1/8 "	1 3/8"	1 5/8"	1 5/8"
AGZ-180	1 3/8"	1 3/8"	1 1/8 "	1 5/8"	1 5/8"	1 5/8"

Table 12, Recommended Horizontal or Downflow Suction Line Size, R-410A

Unit Model AGZ-CB	Connection Size At Unit	Recommended Suction Line Sizes				
		Up to 50 Equiv. Ft	Up to 75 Equiv. Ft	Up to 100 Equiv. Ft	Up to 125 Equiv. Ft	Up to 150 Equiv. Ft
AGZ 030	1 5/8"	1 3/8"	1 3/8"	1 5/8"	1 5/8"	1 5/8"
AGZ 035	1 5/8"	1 3/8"	1 3/8"	1 5/8"	1 5/8"	2 1/8"
AGZ 040	1 5/8"	1 3/8"	1 3/8"	1 5/8**"**	1 5/8**"**	2 1/8"
AGZ 045	1 5/8"	1 3/8"	1 5/8"	1 5/8**"**	1 5/8**"**	2 1/8"
AGZ 050	1 5/8"	1 5/8"	1 5/8**"**	1 5/8"	2 1/8"	2 1/8"
AGZ 055	1 5/8"	1 5/8**"**	1 5/8**"**	2 1/8"	2 1/8"	2 1/8"
AGZ 060	1 5/8"	1 5/8**"**	1 5/8"	2 1/8"	2 1/8"	2 1/8"
AGZ 065	1 5/8"	1 5/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"
AGZ 070	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"
AGZ 075	2 5/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 5/8"
AGZ 085	2 5/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 5/8"
AGZ 090	2 5/8'	2 1/8"	2 1/8"	2 1/8"	2 5/8"	2 5/8"
AGZ 100	2 5/8"	2 1/8"	2 1/8"	2 1/8"	2 5/8"	2 5/8"
AGZ 110	2 5/8"	2 1/8"	2 1/8"	2 5/8"	2 5/8"	2 5/8"
AGZ 125	2 5/8"	2 1/8"	2 1/8"	2 5/8"	2 5/8"	3 1/8"
AGZ 130	2 5/8"	2 1/8"	2 5/8"	2 5/8"	2 5/8"	3 1/8"
AGZ 140	2 5/8"	2 1/8"	2 5/8"	2 5/8"	2 5/8"	3 1/8"
AGZ 160	2 5/8"	2 5/8"	2 5/8"	2 5/8"	3 1/8"	3 1/8"
AGZ 180	2 5/8"	2 5/8"	2 5/8"	2 5/8"	3 1/8"	3 1/8"

Note: For horizontal and vertical downflow only.

Table 13, Refrigerant Piping Derates

Unit Model	Capacity Loss Factor Due to Refrigerant Piping					
	At Unit	50 Equiv. Ft	75 Equiv. Ft	100 Equiv. Ft	125 Equiv. Ft	150 Equiv. Ft
AGZ 030C	1.0	0.98	0.97	0.97	0.96	**0.98**
AGZ 035C	1.0	0.97	0.96	**0.99**	**0.98**	**0.98**
AGZ 040C	1.0	0.97	0.96	**0.98**	**0.98**	**0.98**
AGZ 045C	1.0	0.96	**0.98**	**0.98**	**0.97**	**0.97**
AGZ 050C	1.0	0.96	**0.98**	**0.97**	**0.97**	**0.96**
AGZ 055C	1.0	**0.98**	**0.98**	**0.97**	0.98	0.97
AGZ 060C	1.0	**0.97**	**0.97**	**0.96**	0.97	0.97
AGZ 065C	1.0	**0.97**	**0.96**	0.97	0.96	0.96
AGZ 070C	1.0	0.98	0.97	0.96	0.95	0.95
AGZ 075C	1.0	0.98	0.97	0.96	0.96	0.95
AGZ 085C	1.0	0.98	0.97	0.97	0.96	0.96
AGZ 090C	1.0	0.98	0.97	0.97	0.97	0.96
AGZ 100C	1.0	0.98	0.98	0.97	0.96	**0.97**
AGZ 110C	1.0	0.98	0.98	0.97	**0.98**	**0.97**
AGZ 120C	1.0	0.98	0.98	**0.97**	**0.97**	**0.96**
AGZ 130C	1.0	0.98	**0.98**	**0.97**	**0.96**	**0.95**
AGZ 140C	1.0	0.98	**0.98**	**0.97**	**0.96**	**0.95**
AGZ 160C	1.0	0.98	**0.98**	**0.97**	**0.96**	**0.95**
AGZ 180C	1.0	0.98	**0.98**	**0.97**	**0.96**	**0.95**

Performance Data

I-P Units

Table 14, Performance, AGZ 030C – AGZ 180C

AGZ Unit Size	Fan & Control Power (kW)	LWT (^{0}F)	75^{0}F			85^{0}F			95^{0}F			105^{0}F			115^{0}F		
			Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER
030C	5.6	40.0	33.1	31.6	12.6	31.4	34.9	10.8	29.6	38.8	9.2	27.7	43.1	7.7	25.6	47.9	6.4
		42.0	34.2	31.9	12.9	32.4	35.2	11.0	30.6	39.1	9.4	28.6	43.4	7.9	26.4	48.3	6.6
		44.0	35.2	32.2	13.1	33.5	35.5	11.3	31.5	39.4	9.6	29.5	43.8	8.1	27.2	48.7	6.7
		46.0	36.4	32.5	13.4	34.5	35.9	11.5	32.5	39.7	9.8	30.3	44.2	8.2	28.1	49.1	6.9
		48.0	37.4	32.9	13.6	35.5	36.2	11.8	33.5	40.1	10.0	31.3	44.5	8.4	28.9	49.5	7.0
		50.0	38.5	33.3	13.9	36.5	36.6	12.0	34.4	40.5	10.2	32.2	44.9	8.6	29.8	50	7.1
035C	5.6	40.0	35.9	34.2	12.6	34.0	37.8	10.8	32.1	41.9	9.2	30.0	46.6	7.7	27.8	51.8	6.4
		42.0	37.0	34.5	12.9	35.1	38.1	11.1	33.1	42.3	9.4	30.9	46.9	7.9	28.6	52.2	6.6
		44.0	38.2	34.8	13.1	36.2	38.4	11.3	34.1	42.6	9.6	31.9	47.3	8.1	29.5	52.7	6.7
		46.0	39.4	35.2	13.4	37.3	38.8	11.5	35.2	42.9	9.8	32.8	47.8	8.3	30.4	53.1	6.9
		48.0	40.5	35.6	13.7	38.4	39.1	11.8	36.2	43.4	10.0	33.9	48.1	8.4	31.3	53.5	7.0
		50.0	41.7	36.0	13.9	39.6	39.5	12.0	37.3	43.8	10.2	34.9	48.5	8.6	32.2	54.1	7.2
040C	5.6	40.0	39.0	36.5	12.8	37.0	40.3	11.0	34.9	44.7	9.4	32.6	49.6	7.9	30.2	55.2	6.6
		42.0	40.3	36.8	13.1	38.2	40.6	11.3	36.0	45.0	9.6	33.6	50.0	8.1	31.1	55.7	6.7
		44.0	41.5	37.1	13.4	39.4	41.0	11.5	37.1	45.4	9.8	34.7	50.4	8.3	32.1	56.1	6.9
		46.0	42.8	37.5	13.7	40.6	41.4	11.8	38.3	45.8	10.0	35.7	50.9	8.4	33.1	56.6	7.0
		48.0	44.1	37.9	14.0	41.8	41.7	12.0	39.4	46.2	10.2	36.8	51.3	8.6	34.1	57.1	7.2
		50.0	45.4	38.4	14.2	43.0	42.1	12.3	40.6	46.7	10.4	37.9	51.7	8.8	35.1	57.6	7.3
045C	5.7	40.0	44.3	40.6	13.1	42.0	44.8	11.3	39.6	49.7	9.6	37.0	55.2	8.0	34.3	61.4	6.7
		42.0	45.7	40.9	13.4	43.3	45.1	11.5	40.8	50.1	9.8	38.2	55.7	8.2	35.3	61.9	6.8
		44.0	47.1	41.3	13.7	44.7	45.6	11.8	42.1	50.5	10.0	39.4	56.1	8.4	36.4	62.4	7.0
		46.0	48.6	41.7	14.0	46.1	46.0	12.0	43.4	50.9	10.2	40.5	56.6	8.6	37.6	62.9	7.2
		48.0	50.0	42.2	14.2	47.4	46.4	12.3	44.7	51.4	10.4	41.8	57.1	8.8	38.6	63.5	7.3
		50.0	51.5	42.7	14.5	48.8	46.9	12.5	46.0	51.9	10.6	43.0	57.5	9.0	39.8	64.1	7.4
050C	5.7	40.0	50.1	45.4	13.2	47.5	50.2	11.4	44.7	55.7	9.6	41.8	61.9	8.1	38.7	68.8	6.8
		42.0	51.6	45.8	13.5	49.0	50.6	11.6	46.2	56.1	9.9	43.2	62.4	8.3	39.9	69.4	6.9
		44.0	53.3	46.3	13.8	50.6	51.05	11.9	47.6	56.6	10.1	44.5	62.9	8.5	41.2	70	7.1
		46.0	54.9	46.8	14.1	52.1	51.6	12.1	49.1	57.1	10.3	45.8	63.4	8.7	42.5	70.5	7.2
		48.0	56.5	47.3	14.4	53.6	52.0	12.4	50.6	57.6	10.5	47.3	64.0	8.9	43.7	71.1	7.4
		50.0	58.2	47.8	14.6	55.2	52.5	12.6	52.0	58.2	10.7	48.6	64.5	9.1	45.0	71.8	7.5
055C	5.7	40.0	54.1	50.5	12.8	51.3	55.8	11.0	48.3	61.9	9.4	45.2	68.7	7.9	41.8	76.4	6.6
		42.0	55.8	50.9	13.1	52.9	56.2	11.3	49.9	62.4	9.6	46.6	69.3	8.1	43.1	77.1	6.7
		44.0	57.5	51.5	13.4	54.6	56.7	11.5	51.4	62.9	9.8	48.1	69.9	8.3	44.5	77.7	6.9
		46.0	59.3	52.0	13.7	56.2	57.3	11.8	53.0	63.4	10.0	49.5	70.5	8.4	45.8	78.4	7.0
		48.0	61.1	52.5	14.0	57.9	57.8	12.0	54.6	64.0	10.2	51.0	71.1	8.6	47.2	79.1	7.2
		50.0	62.9	53.2	14.2	59.6	58.4	12.3	56.2	64.7	10.4	52.5	71.6	8.8	48.6	79.8	7.3
060C	5.7	40.0	58.0	55.1	12.6	55.0	60.8	10.8	51.8	67.5	9.2	48.4	75.0	7.8	44.9	83.3	6.5
		42.0	59.8	55.6	12.9	56.7	61.3	11.1	53.4	68.1	9.4	50.0	75.6	7.9	46.2	84.1	6.6
		44.0	61.7	56.1	13.2	58.5	61.9	11.3	55.1	68.6	9.6	51.5	76.2	8.1	47.7	84.8	6.7
		46.0	63.6	56.7	13.5	60.3	62.5	11.6	56.8	69.1	9.9	53.1	76.9	8.3	49.1	85.5	6.9
		48.0	65.5	57.3	13.7	62.1	63.0	11.8	58.5	69.8	10.1	54.7	77.5	8.5	50.6	86.2	7.0
		50.0	67.4	58.0	14.0	63.9	63.7	12.0	60.2	70.5	10.2	56.3	78.1	8.6	52.1	87.1	7.1

Continued next page

AGZ Unit Size	Fan & Control Power (kW)	LWT (^{0}F)	Ambient Air Temp														
			75^{0}F			85^{0}F			95^{0}F			105^{0}F			115^{0}F		
			Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER
065C	7.3	40.0	60.1	53.4	13.5	57.0	59.0	11.6	53.7	65.4	9.8	50.2	72.7	8.3	46.5	80.8	6.9
		42.0	62.0	53.9	13.8	58.8	59.5	11.9	55.4	66.0	10.1	51.8	73.3	8.5	47.9	81.5	7.1
		44.0	63.9	54.4	14.1	60.6	60.0	12.1	57.1	66.5	10.3	53.4	73.9	8.7	49.4	82.2	7.2
		46.0	65.9	54.9	14.4	62.5	60.6	12.4	58.9	67.0	10.5	55.0	74.5	8.9	50.9	82.9	7.4
		48.0	67.8	55.5	14.7	64.4	61.1	12.6	60.6	67.7	10.7	56.7	75.1	9.1	52.4	83.6	7.5
		50.0	69.8	56.2	14.9	66.2	61.7	12.9	62.4	68.4	11.0	58.4	75.7	9.2	54	84.4	7.7
070C	7.3	40.0	65.5	62.6	12.6	62.2	69.1	10.8	58.6	76.7	9.2	54.8	85.1	7.7	50.7	94.6	6.4
		42.0	67.6	63.1	12.9	64.1	69.6	11.0	60.4	77.3	9.4	56.5	85.8	7.9	52.3	95.5	6.6
		44.0	69.7	63.7	13.1	66.2	70.3	11.3	62.3	77.9	9.6	58.3	86.5	8.1	53.9	96.3	6.7
		46.0	71.9	64.3	13.4	68.2	71.0	11.5	64.2	78.5	9.8	60.0	87.3	8.2	55.6	97.1	6.9
		48.0	74.0	65.0	13.7	70.2	71.6	11.8	66.2	79.3	10.0	61.9	88.0	8.4	57.2	97.9	7.0
		50.0	76.2	65.8	13.9	72.3	72.3	12.0	68.1	80.1	10.2	63.7	88.7	8.6	58.9	98.9	7.1
075C	10.9	40.0	75.2	72.9	12.4	71.5	79.5	10.8	67.3	87.2	9.3	62.9	95.8	7.9	58.2	105.3	6.6
		42.0	77.6	73.5	12.7	73.7	80.3	11.0	69.5	87.8	9.5	64.9	96.5	8.1	60.1	106.1	6.8
		44.0	80.0	74.2	12.9	76.0	81.0	11.3	71.6	88.6	9.7	66.9	97.3	8.3	61.9	106.9	6.9
		46.0	82.6	74.9	13.2	78.3	81.7	11.5	73.8	89.4	9.9	69.0	98.1	8.4	63.8	107.9	7.1
		48.0	85.1	75.5	13.5	80.7	82.4	11.8	76.0	90.1	10.1	71.1	98.8	8.6	65.7	108.8	7.2
		50.0	87.7	76.2	13.8	83.3	82.9	12.0	78.3	90.9	10.3	73.1	99.8	8.8	67.7	109.7	7.4
080C	10.9	40.0	83.5	81.8	12.2	79.3	89.2	10.7	74.7	97.8	9.2	69.8	107.5	7.8	64.6	118.2	6.6
		42.0	86.2	82.5	12.5	81.8	90.1	10.9	77.1	98.5	9.4	72.0	108.2	8.0	66.7	119.1	6.7
		44.0	88.9	83.3	12.8	84.3	90.9	11.1	79.5	99.4	9.6	74.3	109.1	8.2	68.8	120.0	6.9
		46.0	91.7	84.0	13.1	87.0	91.6	11.4	82.0	100.3	9.8	76.6	110.0	8.3	70.8	121.1	7.0
		48.0	94.5	84.7	13.4	89.6	92.4	11.6	84.4	101.1	10.0	78.9	110.8	8.5	72.9	122.1	7.2
		50.0	97.4	85.5	13.7	92.5	93.0	11.9	87.0	102.0	10.2	81.2	111.9	8.7	75.1	123.1	7.3
090C	10.9	40.0	90.6	88.8	12.3	86.1	96.8	10.7	81.1	106.2	9.2	75.8	116.6	7.8	70.2	128.3	6.6
		42.0	93.5	89.6	12.5	88.8	97.8	10.9	83.7	106.9	9.4	78.2	117.5	8.0	72.4	129.3	6.7
		44.0	96.5	90.4	12.8	91.6	98.6	11.1	86.3	107.9	9.6	80.7	118.5	8.2	74.6	130.2	6.9
		46.0	99.5	91.2	13.1	94.4	99.5	11.4	89.0	108.9	9.8	83.1	119.4	8.4	76.9	131.4	7.0
		48.0	102.6	91.9	13.4	97.3	100.3	11.6	91.7	109.7	10.0	85.7	120.3	8.6	79.1	132.5	7.2
		50.0	105.7	92.8	13.7	100.4	101.0	11.9	94.4	110.7	10.2	88.1	121.5	8.7	81.6	133.6	7.3
100C	10.9	40.0	102.7	100.7	12.2	97.6	109.7	10.7	91.9	120.3	9.2	85.9	132.2	7.8	79.5	145.4	6.6
		42.0	106.0	101.5	12.5	101.0	110.8	10.9	94.9	121.2	9.4	88.6	133.2	8.0	82.1	146.5	6.7
		44.0	109.3	102.5	12.8	103.8	111.8	11.1	97.8	122.3	9.6	91.4	134.3	8.2	84.6	147.6	6.9
		46.0	112.8	103.3	13.1	107.0	112.8	11.4	100.8	123.4	9.8	94.2	135.4	8.3	87.1	149.0	7.0
		48.0	116.3	104.2	13.4	110.2	113.7	11.6	103.9	124.4	10.0	97.1	136.4	8.5	89.7	150.2	7.2
		50.0	119.8	105.2	13.7	113.7	114.5	11.9	107.0	125.5	10.2	99.9	137.7	8.7	92.4	151.4	7.3
110C	14.5	40.0	109.4	107.2	12.2	104.0	116.9	10.7	97.9	128.2	9.2	91.5	140.9	7.8	84.7	154.9	6.6
		42.0	113.0	108.1	12.5	107	118.1	10.9	101.1	129.1	9.4	94.4	141.9	8.0	87.4	156.1	6.7
		44.0	116.5	109.2	12.8	110.6	119.1	11.1	104.2	130.3	9.6	97.4	143.1	8.2	90.1	157.3	6.9
		46.0	120.1	110.1	13.1	114.0	120.1	11.4	107.4	131.5	9.8	100.3	144.2	8.3	92.8	158.7	7.0
		48.0	123.9	111.0	13.4	117.4	121.2	11.6	110.7	132.5	10.0	103.5	145.3	8.5	95.6	160.0	7.2
		50.0	127.6	112.1	13.7	121.2	122.0	11.9	114.0	133.7	10.2	106.4	146.7	8.7	98.5	161.3	7.3

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AGZ Unit Size	Fan & Control Power (kW)	LWT (^{0}F)	Ambient Air Temp (^{0}F)														
			75^{0}F			85^{0}F			95^{0}F			105^{0}F			115^{0}F		
			Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER	Unit Tons	PWR kWi	Unit EER
125C	14.5	40.0	120.0	117.6	12.2	114.1	128.2	10.7	107.4	140.6	9.2	100.4	154.5	7.8	92.9	169.9	6.6
		42.0	123.9	118.6	12.5	117.6	129.5	10.9	110.9	141.6	9.4	103.6	155.6	8.0	95.9	171.2	6.7
		44.0	127.8	119.8	12.8	121.3	130.6	11.1	**114.3**	**142.9**	**9.6**	106.9	156.9	8.2	98.9	172.5	6.9
		46.0	131.8	120.8	13.1	125.0	131.8	11.4	117.8	144.2	9.8	110.1	158.2	8.3	101.8	174.1	7.0
		48.0	135.9	121.8	13.4	128.8	132.9	11.6	121.4	145.3	10.0	113.5	159.3	8.5	104.8	175.5	7.2
		50.0	140.0	122.9	13.7	132.9	133.8	11.9	125.0	146.6	10.2	116.7	160.9	8.7	108.0	176.9	7.3
130C	14.5	40.0	130.9	128.3	12.2	124.5	139.8	10.7	117.2	153.4	9.2	109.5	168.5	7.8	101.4	185.4	6.6
		42.0	135.2	129.4	12.5	128.3	141.2	10.9	121.0	154.5	9.4	113.0	169.8	8.0	104.6	186.8	6.7
		44.0	139.4	130.6	12.8	132.3	142.5	11.1	**124.7**	**155.9**	**9.6**	116.6	171.2	8.2	107.9	188.2	6.9
		46.0	143.8	131.7	13.1	136.4	143.7	11.4	128.6	157.3	9.8	120.1	172.6	8.3	111.1	189.9	7.0
		48.0	148.3	132.8	13.4	140.5	145.0	11.6	132.4	158.6	10.0	123.8	173.8	8.5	114.3	191.4	7.2
		50.0	152.8	134.1	13.7	145.0	145.9	11.9	136.4	160.0	10.2	127.3	175.5	8.7	117.8	193.0	7.3
140C	18.2	40.0	140.4	133.4	12.6	133.4	145.4	11.0	125.7	159.5	9.5	117.4	175.2	8.0	108.7	192.7	6.8
		42.0	144.9	134.5	12.9	137.6	146.9	11.2	129.7	160.6	9.7	121.1	176.5	8.2	112.2	194.2	6.9
		44.0	149.5	135.8	13.2	141.9	148.2	11.5	**133.7**	**162.1**	**9.9**	125.0	178.0	8.4	115.7	195.7	7.1
		46.0	154.2	137.0	13.5	146.3	149.5	11.7	137.8	163.6	10.1	128.8	179.4	8.6	119.1	197.4	7.2
		48.0	159.0	138.1	13.8	150.7	150.8	12.0	142.0	164.9	10.3	132.8	180.7	8.8	122.6	199.1	7.4
		50.0	163.8	139.4	14.1	155.5	151.7	12.3	146.3	166.3	10.6	136.5	182.5	9.0	126.3	200.7	7.6
160C	18.2	40.0	159.1	154.2	12.4	151.2	168.1	10.8	142.4	184.4	9.3	133.0	202.6	7.9	123.2	222.8	6.6
		42.0	164.2	155.5	12.7	155.9	169.8	11.0	147.0	185.7	9.5	137.3	204.1	8.1	127.1	224.5	6.8
		44.0	169.4	157.0	12.9	160.7	171.3	11.3	**151.5**	**187.4**	**9.7**	141.7	205.8	8.3	131.0	226.2	7.0
		46.0	174.7	158.4	13.2	165.7	172.8	11.5	156.2	189.1	9.9	145.9	207.5	8.4	135.0	228.3	7.1
		48.0	180.1	159.7	13.5	170.7	174.3	11.8	160.9	190.6	10.1	150.4	209.0	8.6	138.9	230.1	7.2
		50.0	185.6	161.2	13.8	176.2	175.4	12.1	165.7	192.3	10.3	154.7	211.0	8.8	143.2	232.0	7.4
180C	18.2	40.0	177.8	174.1	12.2	169.0	189.8	10.7	159.1	208.2	9.2	148.6	228.7	7.8	137.6	251.6	6.6
		42.0	183.5	175.6	12.5	174.2	191.7	10.9	164.2	209.7	9.4	153.4	230.4	8.0	142.0	253.5	6.7
		44.0	189.3	177.3	12.8	179.6	193.4	11.1	**169.3**	**211.6**	**9.6**	158.3	232.3	8.2	146.4	255.4	6.9
		46.0	195.2	178.8	13.1	185.2	195.1	11.4	174.5	213.5	9.8	163.0	234.2	8.4	150.8	257.7	7.0
		48.0	201.3	180.3	13.4	190.8	196.8	11.6	179.8	215.2	10.0	168.1	235.9	8.6	155.2	259.8	7.2
		50.0	207.4	182.0	13.7	196.9	198.1	11.9	185.2	217.1	10.2	172.9	238.3	8.7	160.0	262.0	7.3

NOTES:
1. Ratings in accordance with ARI Standard 550/590-2003. Shaded and bold ratings are at ARI standard conditions.
2. Ratings based on R-410A, evaporator fouling factor of 0.0001, evaporator water flow of 2.4 gpm/ton and sea level altitude.
3. KW input is for the entire unit including compressors, fan motors and control power.
4. Interpolation is allowed; extrapolation is not permitted. Consult McQuay for performance outside the cataloged ratings.
5. For LWT below 40° F please refer to the Application Considerations section.

SI Units

Table 15, AGZ 030C – AGZ 180C

AGZ Unit Size	Fan & Control Power (kW)	LWT (^{0}F)	Ambient Air Temperature (^{o}C)														
			25			30			35			40			45		
			Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP
030C	5.6	5.0	117.2	32.6	3.6	111.6	35.5	3.1	105.8	38.9	2.7	98.8	42.8	2.3	91.6	47.2	1.9
		6.0	120.4	32.8	3.7	114.8	35.8	3.2	108.7	39.2	2.8	101.6	43.2	2.4	94.1	47.6	2.0
		7.0	123.8	33.0	3.8	118.0	36.0	3.3	111.8	39.5	2.8	104.5	43.4	2.4	96.8	47.9	2.0
		8.0	127.2	33.3	3.8	121.2	36.3	3.3	114.8	39.8	2.9	107.4	43.8	2.5	99.4	48.3	2.1
		9.0	130.6	33.6	3.9	124.5	36.6	3.4	117.9	40.2	2.9	110.2	44.2	2.5	102.1	48.7	2.1
		10.0	134.1	33.9	4.0	127.7	36.9	3.5	121.0	40.5	3.0	113.1	44.5	2.5	104.8	49.1	2.1
035C	5.6	5.0	126.9	35.2	3.6	120.9	38.4	3.1	114.5	42.1	2.7	107.0	46.3	2.3	99.1	51.0	1.9
		6.0	130.4	35.5	3.7	124.2	38.7	3.2	117.7	42.4	2.8	110.0	46.7	2.4	101.9	51.4	2.0
		7.0	134.0	35.7	3.8	127.7	38.9	3.3	121.0	42.7	2.8	113.1	47.0	2.4	104.8	51.8	2.0
		8.0	137.7	36.0	3.8	131.3	39.3	3.3	124.3	43	2.9	116.2	47.3	2.5	107.6	52.2	2.1
		9.0	141.4	36.3	3.9	134.8	39.6	3.4	127.7	43.4	2.9	119.3	47.7	2.5	110.5	52.6	2.1
		10.0	145.1	36.6	4.0	138.3	39.9	3.5	131.0	43.8	3.0	122.4	48.1	2.5	113.4	53.1	2.1
040C	5.6	5.0	138.0	37.5	3.7	131.5	40.9	3.2	124.6	44.9	2.8	116.4	49.3	2.4	107.8	54.4	2.0
		6.0	141.8	37.8	3.8	135.2	41.2	3.3	128.0	45.2	2.8	119.6	49.7	2.4	110.8	54.8	2.0
		7.0	145.8	38.0	3.8	139.0	41.5	3.3	131.7	45.5	2.9	123.1	50.0	2.5	114.0	55.2	2.1
		8.0	149.8	38.4	3.9	142.8	41.8	3.4	135.3	45.9	2.9	126.4	50.5	2.5	117.1	55.6	2.1
		9.0	153.9	38.7	4.0	146.6	42.2	3.5	138.9	46.3	3.0	129.8	50.9	2.6	120.2	56.1	2.1
		10.0	157.9	39.0	4.0	150.4	42.5	3.5	142.5	46.7	3.1	133.2	51.3	2.6	123.4	56.6	2.2
045C	5.7	5.0	156.6	41.7	3.8	149.2	45.5	3.3	141.4	49.9	2.8	132.1	54.9	2.4	122.4	60.5	2.0
		6.0	160.9	42.1	3.8	153.4	45.9	3.3	145.3	50.3	2.9	135.8	55.3	2.5	125.8	61.0	2.1
		7.0	165.5	42.3	3.9	157.7	46.1	3.4	149.4	50.6	3.0	139.6	55.7	2.5	129.3	61.4	2.1
		8.0	170.0	42.7	4.0	162.0	46.5	3.5	153.5	51	3.0	143.5	56.1	2.6	132.9	61.9	2.1
		9.0	174.6	43.0	4.1	166.4	46.9	3.5	157.6	51.5	3.1	147.3	56.6	2.6	136.4	62.4	2.2
		10.0	179.2	43.4	4.1	170.7	47.3	3.6	161.7	51.9	3.1	151.1	57.1	2.6	140.0	62.9	2.2
050C	5.7	5.0	177.1	46.8	3.8	168.7	51.0	3.3	159.8	55.9	2.9	149.4	61.5	2.4	138.4	67.8	2.0
		6.0	182.0	47.1	3.9	173.4	51.4	3.4	164.3	56.4	2.9	153.5	62.0	2.5	142.2	68.4	2.1
		7.0	187.1	47.4	3.9	178.3	51.7	3.4	168.9	56.7	3.0	157.9	62.4	2.5	146.2	68.8	2.1
		8.0	192.3	47.8	4.0	183.2	52.1	3.5	173.5	57.2	3.0	162.2	62.9	2.6	150.2	69.3	2.2
		9.0	197.4	48.2	4.1	188.1	52.6	3.6	178.2	57.7	3.1	166.6	63.4	2.6	154.3	69.9	2.2
		10.0	202.6	48.6	4.2	193.0	53.0	3.6	182.8	58.2	3.1	170.9	64.0	2.7	158.3	70.5	2.2
055C	5.7	5.0	191.2	52.0	3.7	182.2	56.7	3.2	172.6	62.2	2.8	161.3	68.4	2.4	149.4	75.4	2.0
		6.0	196.5	52.4	3.8	187.3	57.1	3.3	177.4	62.6	2.8	165.8	68.9	2.4	153.5	76.0	2.0
		7.0	202.1	52.7	3.8	192.5	57.5	3.3	182.4	63	2.9	170.5	69.3	2.5	157.9	76.4	2.1
		8.0	207.6	53.1	3.9	197.8	58.0	3.4	187.4	63.6	2.9	175.2	69.9	2.5	162.2	77.1	2.1
		9.0	213.2	53.6	4.0	203.1	58.4	3.5	192.4	64.1	3.0	179.8	70.5	2.6	166.6	77.7	2.1
		10.0	218.8	54.0	4.0	208.4	58.9	3.5	197.4	64.6	3.1	184.5	71.1	2.6	171.0	78.4	2.2
060C	5.7	5.0	205.0	56.7	3.6	195.3	61.8	3.2	185.0	67.8	2.7	172.9	74.6	2.3	160.2	82.2	1.9
		6.0	210.6	57.1	3.7	200.7	62.3	3.2	190.1	68.3	2.8	177.7	75.1	2.4	164.6	82.8	2.0
		7.0	216.6	57.5	3.8	206.4	62.7	3.3	195.5	68.8	2.8	182.8	75.6	2.4	169.3	83.4	2.0
		8.0	222.5	58.0	3.8	212.1	63.2	3.4	200.9	69.3	2.9	187.8	76.2	2.5	173.9	84.1	2.1
		9.0	228.5	58.4	3.9	217.8	63.7	3.4	206.3	69.9	3.0	192.8	76.9	2.5	178.6	84.8	2.1
		10.0	234.5	58.9	4.0	223.4	64.3	3.5	211.6	70.5	3.0	197.8	77.5	2.6	183.3	85.5	2.1

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AGZ Unit Size	Fan & Control (kW)	LWT (^{0}F	25ºC			30ºC			35ºC			40ºC			45ºC		
			Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP
065C	7.3	5.0	212.4	54.9	3.9	202.4	59.9	3.4	191.7	65.7	2.9	179.2	72.3	2.5	166.0	79.7	2.1
		6.0	218.3	55.4	3.9	208.0	60.4	3.4	197.0	66.2	3.0	184.1	72.8	2.5	170.6	80.3	2.1
		7.0	224.5	55.7	4.0	213.9	60.8	3.5	202.6	66.6	3.0	189.4	73.3	2.6	175.4	80.8	2.2
		8.0	230.6	56.2	4.1	219.8	61.3	3.6	208.2	67.2	3.1	194.6	73.9	2.6	180.2	81.5	2.2
		9.0	236.8	56.7	4.2	225.7	61.8	3.7	213.8	67.8	3.2	199.8	74.5	2.7	185.1	82.2	2.3
		10.0	243.0	57.1	4.3	231.5	62.3	3.7	219.3	68.3	3.2	205.0	75.2	2.7	189.9	82.9	2.3
070C	7.3	5.0	231.8	64.4	3.6	220.8	70.2	3.1	209.2	77.0	2.7	195.5	84.7	2.3	181.1	93.4	1.9
		6.0	238.2	64.9	3.7	227.0	70.7	3.2	215.0	77.6	2.8	200.9	85.3	2.4	186.1	94.1	2.0
		7.0	244.9	65.3	3.8	233.4	71.2	3.3	221.1	78.1	2.8	206.6	85.9	2.4	191.4	94.7	2.0
		8.0	251.6	65.8	3.8	239.8	71.8	3.3	227.1	78.7	2.9	212.3	86.6	2.5	196.6	95.4	2.1
		9.0	258.4	66.4	3.9	246.2	72.4	3.4	233.3	79.4	2.9	218.0	87.3	2.5	201.9	96.3	2.1
		10.0	265.1	66.9	4.0	252.6	73.0	3.5	239.3	80.1	3.0	223.7	88.0	2.5	207.2	97.1	2.1
075C	10.9	5.0	266.4	73.2	3.6	253.8	79.8	3.2	240.4	87.6	2.7	224.7	96.3	2.3	208.1	106.2	2.0
		6.0	273.7	73.8	3.7	260.8	80.5	3.2	247.1	88.2	2.8	230.9	97.0	2.4	213.9	107.0	2.0
		7.0	281.5	74.2	3.8	268.2	81.0	3.3	254.1	88.8	2.9	237.5	97.6	2.4	220.0	107.7	2.0
		8.0	289.2	74.8	3.9	275.6	81.6	3.4	261.1	89.5	2.9	244.0	98.5	2.5	226.0	108.6	2.1
		9.0	296.9	75.5	3.9	283.0	82.3	3.4	268.1	90.3	3.0	250.5	99.3	2.5	232.1	109.5	2.1
		10.0	304.7	76.1	4.0	290.3	83.0	3.5	275.0	91.1	3.0	257.0	100.1	2.6	238.1	110.4	2.2
080C	10.9	5.0	295.7	82.1	3.6	281.7	89.6	3.1	266.9	98.2	2.7	249.5	108.0	2.3	231.1	119.1	1.9
		6.0	303.9	82.8	3.7	289.6	90.3	3.2	274.3	99.0	2.8	256.4	108.9	2.4	237.5	120.0	2.0
		7.0	312.5	83.3	3.8	297.8	90.8	3.3	282.1	99.6	2.8	263.7	109.6	2.4	244.2	120.8	2.0
		8.0	321.1	84.0	3.8	306.0	91.6	3.3	289.9	100.4	2.9	270.9	110.5	2.5	250.9	121.8	2.1
		9.0	329.7	84.7	3.9	314.2	92.4	3.4	297.6	101.3	2.9	278.2	111.4	2.5	257.7	122.8	2.1
		10.0	338.4	85.4	4.0	322.4	93.1	3.5	305.4	102.2	3.0	285.4	112.3	2.5	264.4	123.9	2.1
090C	10.9	5.0	321.0	89.2	3.6	305.8	97.2	3.1	289.8	106.6	2.7	270.8	117.3	2.3	250.9	129.3	1.9
		6.0	329.9	89.8	3.7	314.4	98.0	3.2	297.8	107.5	2.8	278.3	118.2	2.4	257.8	130.3	2.0
		7.0	339.2	90.4	3.8	323.3	98.6	3.3	306.3	108.1	2.8	286.3	118.9	2.4	265.1	131.1	2.0
		8.0	348.6	91.2	3.8	332.2	99.4	3.3	314.6	109.0	2.9	294.1	119.9	2.5	272.4	132.2	2.1
		9.0	357.9	91.9	3.9	341.1	100.3	3.4	323.1	110.0	2.9	302.0	120.9	2.5	279.7	133.3	2.1
		10.0	367.3	92.7	4.0	349.9	101.1	3.5	331.5	110.9	3.0	309.8	121.9	2.5	287.0	134.5	2.1
100C	10.9	5.0	363.8	101.0	3.6	346.6	110.2	3.1	328.4	120.9	2.7	306.9	132.9	2.3	284.3	146.6	1.9
		6.0	373.9	101.8	3.7	356.3	111.1	3.2	337.5	121.8	2.8	315.4	134.0	2.4	292.1	147.7	2.0
		7.0	384.5	102.5	3.8	366.4	111.8	3.3	347.1	122.6	2.8	324.4	134.8	2.4	300.4	148.6	2.0
		8.0	395.0	103.3	3.8	376.4	112.7	3.3	356.6	123.6	2.9	333.3	135.9	2.5	308.7	149.8	2.1
		9.0	405.6	104.2	3.9	386.5	113.6	3.4	366.2	124.6	2.9	342.2	137.1	2.5	317.0	151.1	2.1
		10.0	416.2	105.1	4.0	396.6	114.6	3.5	375.6	125.7	3.0	351.1	138.2	2.5	325.3	152.4	2.1
110C	14.5	5.0	387.6	107.7	3.6	369.3	117.4	3.1	349.9	128.8	2.7	327.0	141.6	2.3	302.9	156.1	1.9
		6.0	398.4	108.5	3.7	379.6	118.3	3.2	359.6	129.8	2.8	336.0	142.7	2.4	311.2	157.4	2.0
		7.0	409.6	109.2	3.8	390.3	119.1	3.3	369.8	130.6	2.8	345.6	143.6	2.4	320.1	158.3	2.0
		8.0	420.9	110.1	3.8	401.1	120.1	3.3	379.9	131.7	2.9	355.1	144.8	2.5	328.9	159.6	2.1
		9.0	432.1	111.0	3.9	411.8	121.1	3.4	390.1	132.8	2.9	364.6	146.0	2.5	337.7	161.0	2.1
		10.0	443.5	112.0	4.0	422.5	122.1	3.5	400.2	133.9	3.0	374.1	147.3	2.5	346.6	162.4	2.1
125C	14.5	5.0	425.2	118.1	3.6	405.1	128.8	3.1	383.8	141.2	2.7	358.7	155.3	2.3	332.3	171.2	1.9
		6.0	437.0	119.0	3.7	416.4	129.8	3.2	394.4	142.3	2.8	368.6	156.5	2.4	341.4	172.6	2.0
		7.0	449.3	119.7	3.8	428.2	130.6	3.3	405.7	143.2	2.8	379.1	157.5	2.4	351.1	173.6	2.0
		8.0	461.7	120.7	3.8	439.9	131.7	3.3	416.7	144.4	2.9	389.5	158.8	2.5	360.7	175.1	2.1
		9.0	474.0	121.7	3.9	451.7	132.8	3.4	427.9	145.6	2.9	399.9	160.2	2.5	370.4	176.6	2.1
		10.0	486.5	122.8	4.0	463.5	133.9	3.5	439.0	146.9	3.0	410.3	161.5	2.5	380.2	178.1	2.1

Continued next page.

AGZ Unit Size	Fan & Control (kW)	LWT (^{0}F)	Ambient Air Temperature (^{o}C)														
			25			30			35			40			45		
			Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP	Unit kW	PWR kWi	Unit COP
130C	14.5	5.0	463.9	128.8	3.6	441.9	140.5	3.1	418.7	154.1	2.7	391.3	169.4	2.3	362.5	186.8	1.9
		6.0	476.7	129.8	3.7	454.3	141.6	3.2	430.3	155.3	2.8	402.2	170.8	2.4	372.5	188.3	2.0
		7.0	490.2	130.6	3.8	467.1	142.5	3.3	442.6	156.2	2.8	413.6	171.8	2.4	383.1	189.4	2.0
		8.0	503.7	131.7	3.8	480.0	143.6	3.3	454.7	157.5	2.9	425.0	173.2	2.5	393.6	191.0	2.1
		9.0	517.1	132.8	3.9	492.8	144.9	3.4	466.9	158.9	2.9	436.3	174.7	2.5	404.2	192.6	2.1
		10.0	530.7	133.9	4.0	505.7	146.1	3.5	479.0	160.2	3.0	447.7	176.2	2.5	414.8	194.3	2.1
140C	18.2	5.0	497.4	133.9	3.7	473.8	146.1	3.2	448.9	160.2	2.8	419.6	176.2	2.4	388.7	194.2	2.0
		6.0	511.1	135.0	3.8	487.1	147.2	3.3	461.4	161.5	2.9	431.2	177.6	2.4	399.4	195.8	2.0
		7.0	525.6	135.8	3.9	500.8	148.1	3.4	474.5	162.5	2.9	443.5	178.7	2.5	410.7	197.0	2.1
		8.0	540.0	136.9	3.9	514.6	149.4	3.4	487.5	163.8	3.0	455.6	180.1	2.5	422.0	198.6	2.1
		9.0	554.5	138.1	4.0	528.4	150.6	3.5	500.6	165.2	3.0	467.8	181.7	2.6	433.3	200.3	2.2
		10.0	569.0	139.3	4.1	542.2	151.9	3.6	513.5	166.6	3.1	480.0	183.2	2.6	444.7	202.0	2.2
160C	18.2	5.0	563.6	154.8	3.6	536.9	168.9	3.2	508.7	185.2	2.7	475.4	203.7	2.3	440.4	224.6	2.0
		6.0	579.2	156.0	3.7	551.9	170.2	3.2	522.8	186.7	2.8	488.6	205.3	2.4	452.5	226.3	2.0
		7.0	595.5	157.0	3.8	567.5	171.2	3.3	537.7	187.8	2.9	502.5	206.5	2.4	465.4	227.7	2.0
		8.0	611.9	158.3	3.9	583.1	172.7	3.4	552.4	189.4	2.9	516.3	208.3	2.5	478.1	229.6	2.1
		9.0	628.3	159.7	3.9	598.7	174.1	3.4	567.2	191.0	3.0	530.1	210.0	2.5	491.0	231.6	2.1
		10.0	644.8	161.0	4.0	614.3	175.6	3.5	581.9	192.6	3.0	543.9	211.8	2.6	503.9	233.5	2.2
180C	18.2	5.0	629.8	174.8	3.6	600.0	190.7	3.1	568.5	209.1	2.7	531.3	230.0	2.3	492.2	253.6	1.9
		6.0	647.2	176.2	3.7	616.8	192.2	3.2	584.2	210.8	2.8	546.0	231.8	2.4	505.7	255.5	2.0
		7.0	665.5	177.3	3.8	634.2	193.4	3.3	600.8	212.1	2.8	561.6	233.2	2.4	520.1	257.1	2.0
		8.0	683.8	178.8	3.8	651.6	195.0	3.3	617.3	213.8	2.9	577.0	235.1	2.5	534.3	259.3	2.1
		9.0	702.1	180.3	3.9	669.1	196.6	3.4	633.9	215.6	2.9	592.4	237.1	2.5	548.7	261.5	2.1
		10.0	720.5	181.8	4.0	686.5	198.3	3.5	650.3	217.5	3.0	607.8	239.1	2.5	563.1	263.7	2.1

NOTES:
1. Ratings in accordance with ARI Standard 550/590-2003.
2. Ratings based on R-410A, evaporator fouling factor of 0.0176, 5.6^o C evaporator delta-T, and sea level altitude.
3. KW input is for the entire unit including compressors, fan motors and control power.
4. Interpolation is allowed; extrapolation is not permitted. Consult McQuay for performance outside the cataloged ratings.
5. For LWT below 5.0° C please refer to Application Considerations.

Part-load Data

Table 16, Part-load Data, AGZ 030C – AGZ 180C

Unit Size	% Unit Load	Capacity Tons	Power kWi	EER	IPLV
30	100	31.5	39.4	9.6	13.9
	75	23.6	23.4	12.1	
	50	15.8	12.4	15.2	
	25	7.9	6.0	15.8	
035	100	34.1	42.6	9.6	14.2
	75	25.6	25.0	12.3	
	50	17.1	13.2	15.5	
	25	8.5	6.4	16.0	
040	100	37.1	45.4	9.8	14.4
	75	27.8	26.1	12.8	
	50	18.6	14.3	15.6	
	25	9.3	6.9	16.2	
045	100	42.1	50.5	10.0	14.4
	75	31.6	28.9	13.1	
	50	21.1	16.4	15.4	
	25	10.5	7.8	16.2	
050	100	47.6	56.6	10.1	14.6
	75	35.7	32.5	13.2	
	50	23.8	18.4	15.5	
	25	11.9	8.8	16.2	
055	100	51.4	62.9	9.8	14.5
	75	38.6	35.3	13.1	
	50	25.7	19.9	15.5	
	25	12.9	9.5	16.3	
060	100	55.1	68.9	9.6	14.5
	75	41.3	38.1	13.0	
	50	27.6	21.5	15.4	
	25	13.8	10.1	16.4	
065	100	57.1	66.5	10.3	14.7
	75	42.8	38.6	13.3	
	50	28.6	22.0	15.6	
	25	14.3	10.4	16.5	
070	100	62.3	77.9	9.6	14.5
	75	46.7	43.1	13.0	
	50	31.2	24.3	15.4	
	25	15.6	11.4	16.4	
075	100	71.6	88.6	9.7	14.3
	75	53.7	50.0	12.9	
	50	35.8	28.5	15.1	
	25	17.9	13.3	16.2	

Unit Size	% Unit Load	Capacity Tons	Power kWi	EER	IPLV
080	**100**	**79.5**	**99.4**	**9.6**	**14.2**
	75	**59.6**	**55.9**	**12.8**	
	50	**39.8**	**31.8**	**15.0**	
	25	**19.9**	**14.8**	**16.1**	
090	**100**	**86.3**	**107.9**	**9.6**	**14.2**
	75	**64.7**	**60.7**	**12.8**	
	50	**43.2**	**34.6**	**15.0**	
	25	**21.6**	**16.0**	**16.2**	
100	**100**	**97.8**	**122.3**	**9.6**	**14.2**
	75	**73.4**	**68.8**	**12.8**	
	50	**48.9**	**38.9**	**15.1**	
	25	**24.5**	**15.8**	**16.1**	
110	**100**	**104.2**	**130.3**	**9.6**	**14.2**
	75	**78.2**	**73.3**	**12.8**	
	50	**52.1**	**41.7**	**15.0**	
	25	**26.1**	**18.6**	**16.8**	
125	**100**	**114.3**	**142.9**	**9.6**	**14.4**
	75	**85.7**	**79.1**	**13.0**	
	50	**57.2**	**45.1**	**15.2**	
	25	**28.6**	**20.2**	**17.0**	
130	**100**	**124.7**	**155.9**	**9.6**	**14.6**
	75	**93.5**	**86.3**	**13.0**	
	50	**62.4**	**48.3**	**15.5**	
	25	**31.2**	**22.0**	**17.0**	
140	**100**	**133.7**	**162.1**	**9.9**	**14.7**
	75	**100.3**	**91.9**	**13.1**	
	50	**66.9**	**51.4**	**15.6**	
	25	**33.4**	**23.3**	**17.2**	
160	**100**	**151.5**	**187.4**	**9.7**	**14.6**
	75	**113.6**	**104.1**	**13.1**	
	50	**75.8**	**58.6**	**15.5**	
	25	**37.9**	**26.6**	**17.1**	
180	**100**	**169.3**	**211.6**	**9.6**	**14.6**
	75	**127.0**	**117.2**	**13.0**	
	50	**84.7**	**65.5**	**15.5**	
	25	**42.3**	**29.9**	**17.0**	

NOTE: Certified according to ARI Standard 550/590-2003.

SOUND

Sound levels can be as important as unit cost and efficiency, and must be addressed before the start of any development program. Efforts by McQuay design engineers to design chillers that are sensitive to the sound requirements of the market, combined with inherently quiet scroll compressors, have paid off.

Background Information

Sound is a vibration in an elastic medium and is essentially a pressure and particle displacement phenomena. A vibrating body produces compression waves and, as the waves are emitted from the vibrating body, molecules are compressed. These values are transmitted through gas, liquid, solid--anything that is elastic or viscous.

The sound data provided in this section is presented with both sound pressure and sound power levels. Sound power is the total sound energy radiated by a source per unit of time integrated over the surface through which the sound is radiated. Sound power is a calculated quantity and cannot be measured directly like sound pressure. Sound power is not dependent on the surrounding environment or distance from the source, as is sound pressure.

Sound pressure varies with the distance from the source and is dependent on its surroundings. For example, a brick wall located 10 feet from a unit will affect the sound pressure measurements differently than a brick wall at 20 feet. Sound pressure is measured in decibels (dB), which is a dimensionless ratio (on a logarithmic scale) between measured sound pressure and a reference sound pressure level.

Sound Pressure Levels - Full Load

All sound pressure tables give the overall "A-weighted" sound pressure levels which are considered typical of what can be measured in a free field with a handheld sound meter, in the absence of any nearby reflective surfaces. The sound pressure levels are measured at 30 feet (10 meters) from the side of the unit at 100% unit load and ARI conditions. 95° F (35° C) ambient air temperature and 54/44° F (12/7° C) evaporator water temperatures for air-cooled units.

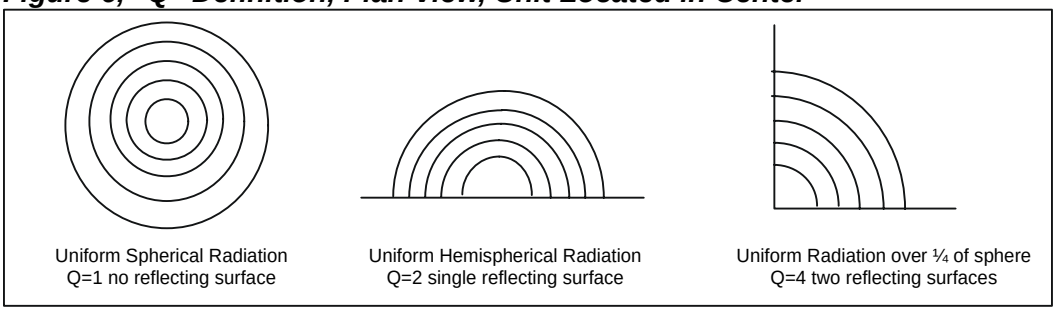
Sound Power Levels

Acoustical consultants can require sound power octave band data to perform a detailed acoustical analysis. The tables present sound power levels per ARI Standard 370, “Sound Rating of Large Outdoor Refrigerating and Air Conditioning Equipment”. These standards were developed to establish uniform methods of determining the sound power radiated by large outdoor and indoor equipment. The aforementioned methods are based on providing sound power levels by octave band and the overall ‘A’ weighted value. Measurements are taken over a prescribed area around the unit and the data is mathematically calculated to give the sound power, dB. Sound power can be thought of as basic sound level emanating from the unit without consideration of distance or obstructions.

Sound Reduction due to Distance from the Unit

The distance between a source of sound and the location of the sound measurement plays an important role in minimizing sound problems. The equation below can be used to calculate the sound pressure level at any distance if the sound power is known. Results for typical distances are tabulated in Table 17, dB Conversion of Sound Power to Pressure for Distance. Another way of determining the effect of distance is to work from sound pressure only. “Q”, the directionality factor, is a dimensionless number that compensates for the type of sound reflection from the source. For example, a unit sitting on a flat roof or ground with no other reflective surfaces or attenuation due to grass, snow, etc., between source and receiver: Q=2.

Figure 6, "Q" Definition, Plan View, Unit Located in Center



Sound pressure can be calculated at any distance from the unit if the sound power is known.
Lp=Lw-(20 log r) + (10 log Q) - .5

Lp = sound pressure r = distance from unit in feet

Lw = sound power Q = directionality factor

With Q=1, Unit suspended in space (theoretical condition), the equation simplifies to:
Lp = Lw – (20)(log r) –0.5

With Q=2, for a unit sitting on a flat roof or ground with no adjacent vertical wall as a reflective surface, the equation simplifies to:
Lp = Lw – (20)(log r) + 2.5

With Q=4 for a unit sitting on a flat roof or ground with one adjacent vertical wall as a reflective surface, the equation simplifies to:
Lp = Lw – (20)(log r) + 5.5

The equations are reduced to table form in Table 17 for various distances and the two most usual cases of “Q” type of location.

Table 17, dB Conversion of Sound Power to Pressure for Distance

Distance from Sound Source ft. (m)	DB Reduction from Sound Power at the Source to Sound Pressure at Referenced Distance	
	Q=2	Q=4
30 (9)	27.1	24.0
50 (15)	31.6	28.5
75 (23)	35.1	32.0
100 (30)	37.6	34.5
150 (46)	41.1	38.0
200 (61)	43.6	40.5
300 (91)	47.6	44.0

Sound Data

Table 18, AGZ 030C-180C, Sound Pressure w/o Sound Insulation

AGZ Unit Model	Number of Comp.	Number of Fans	Octave Band at Center Frequency								Overall A-Weighted
			63	125	250	500	1000	2000	4000	8000	
030C	4	4	65	64	61	60	56	51	46	41	61
035C	4	4	65	64	62	60	56	51	46	41	61
040C	4	4	65	64	63	61	57	52	47	42	62
045C	4	4	66	65	64	62	58	52	47	42	63
050C	4	4	66	66	64	62	58	52	47	42	63
055C	4	4	66	66	66	62	59	54	49	44	64
060C	4	4	67	66	67	62	59	54	49	44	64
065C	4	4	68	67	67	62	60	54	49	44	65
070C	4	4	68	68	67	62	60	54	49	44	65
075C	4	6	68	68	68	62	60	54	49	44	65
085C	4	6	67	65	65	64	62	56	54	54	66
090C	4	6	67	66	66	64	62	56	54	54	66
100C	6	6	66	68	65	65	62	56	56	55	67
110C	6	8	66	69	66	65	62	56	56	55	67
125C	6	8	67	68	66	65	62	58	59	56	68
130C	6	8	67	69	67	65	62	59	59	56	68
140C	6	10	68	70	68	66	63	60	60	57	69
160C	6	10	69	71	69	67	64	61	60	58	70
180C	6	10	69	71	69	67	64	61	61	58	70

Note: Data at:

1. 30 feet (9m) from side of unit.
2. Q=2, unit on a flat roof or ground with no adjacent wall.
3. Octave band readings are flat dB, overall is “A” weighted.

Table 19, AGZ 030C-180C, Sound Power w/o Sound insulation

AGZ Unit Model	Number of Comp.	Number of Fans	Octave Band at Center Frequency (per ARI Standard 370)								Overall A-Weighted
			63	125	250	500	1000	2000	4000	8000	
030C	4	4	92	91	88	87	83	78	73	68	88
035C	4	4	92	91	89	87	83	78	73	68	88
040C	4	4	92	91	90	88	84	79	74	69	89
045C	4	4	93	92	91	89	85	79	74	69	90
050C	4	4	93	93	91	89	85	79	74	69	90
055C	4	4	93	93	93	89	86	81	76	71	91
060C	4	4	94	93	94	89	86	81	76	71	91
065C	4	4	95	94	94	89	87	81	76	71	92
070C	4	4	95	95	94	89	87	81	76	71	92
075C	4	6	95	95	95	89	87	81	76	71	92
085C	4	6	94	92	92	91	89	83	81	81	93
090C	4	6	94	93	93	91	89	83	81	81	93
100C	6	6	93	95	92	92	89	83	83	82	94
110C	6	8	93	96	93	92	89	83	83	82	94
125C	6	8	94	95	93	92	89	85	86	83	95
130C	6	8	94	96	94	92	89	86	86	83	95
140C	6	10	95	97	95	93	90	87	87	84	96
160C	6	10	96	98	96	94	91	88	87	85	97
180C	6	10	96	98	96	94	91	88	88	85	97

Note: Octave band readings are flat dB, overall is “A” weighted.

Table 20, AGZ 030C-180C, Sound Pressure with Sound Insulation

AGZ Unit Model	Number of Comp.	Number of Fans	Octave Band at Center Frequency								Overall A-Weighted
			63	125	250	500	1000	2000	4000	8000	
030C	4	4	57	57	56	57	50	48	47	43	58
035C	4	4	57	57	56	57	50	48	47	43	58
040C	4	4	57	57	56	57	50	48	47	43	58
045C	4	4	58	58	58	59	53	50	48	43	60
050C	4	4	58	58	58	59	53	50	48	43	60
055C	4	4	58	58	58	59	53	50	48	43	60
060C	4	4	58	58	58	59	53	50	48	43	60
065C	4	4	59	58	58	59	53	50	48	43	60
070C	4	4	61	58	58	59	53	50	48	43	60
075C	4	6	61	58	59	59	54	54	50	43	61
085C	4	6	61	59	59	59	56	53	50	44	61
090C	4	6	61	59	59	59	56	53	50	44	61
100C	6	6	63	59	59	59	56	53	50	44	61
110C	6	8	63	59	59	59	56	53	50	44	61
125C	6	8	63	59	60	59	56	53	50	44	61
130C	6	8	63	59	60	60	57	53	50	44	62
140C	6	10	64	60	61	61	58	54	52	46	63
160C	6	10	65	61	62	62	59	55	53	47	64
180C	6	10	65	61	62	62	60	56	54	47	64

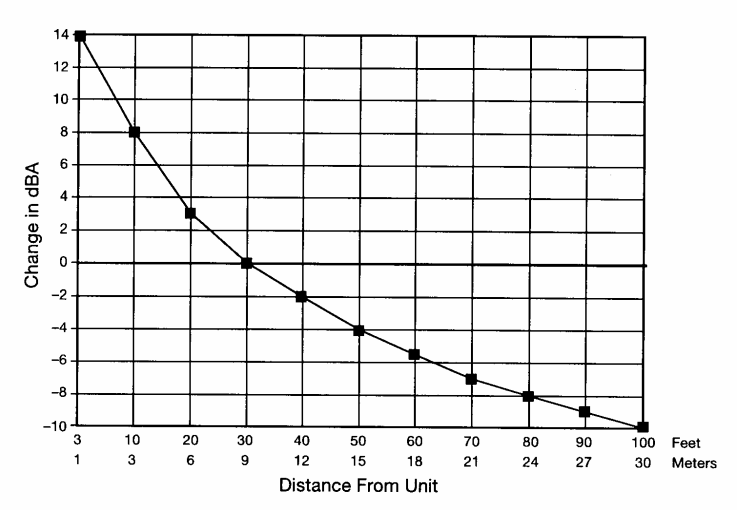
Note: Data at:
1. 30 feet (9m) from side of unit.
2. Q=2, unit on a flat roof or ground with no adjacent wall.
3. Octave band readings are flat dB, overall is “A” weighted.

Table 21, AGZ 030C-180C, Sound Power with Sound insulation

AGZ Unit Model	Number of Comp.	Number of Fans	Octave Band at Center Frequency (per ARI Standard 370)								Overall A-Weighted
			63	125	250	500	1000	2000	4000	8000	
030C	4	4	84	84	83	84	77	75	74	70	85
035C	4	4	84	84	83	84	77	75	74	70	85
040C	4	4	84	84	83	84	77	75	74	70	85
045C	4	4	85	85	85	86	80	77	75	70	87
050C	4	4	85	85	85	86	80	77	75	70	87
055C	4	4	85	85	85	86	80	77	75	70	87
060C	4	4	85	85	85	86	80	77	75	70	87
065C	4	4	86	85	85	86	80	77	75	70	87
070C	4	4	88	85	85	86	80	77	75	70	87
075C	4	6	88	85	86	86	81	81	77	70	88
085C	4	6	88	86	86	86	83	80	77	71	88
090C	4	6	88	86	86	86	83	80	77	71	88
100C	6	6	90	86	86	86	83	80	77	71	88
110C	6	8	90	86	86	86	83	80	77	71	88
125C	6	8	90	86	87	86	83	80	77	71	88
130C	6	8	90	86	87	87	84	80	77	71	88
140C	6	10	91	87	88	88	85	81	79	73	90
160C	6	10	92	88	89	89	86	82	80	74	91
180C	6	10	92	88	89	89	86	82	80	74	91

Note: Octave band readings are flat dB, overall is “A” weighted.

Figure 7, Sound Pressure Attenuation Due to Distance from Unit



Sound Pressure Levels - Low Ambient Operation

Unit operation at a lower ambient temperature than 95° F (35ºC) will also result in lower sound pressure levels. The sound pressure level will decrease 1 dBA for ambient temperatures between 85ºF and 94° F (29.4ºC and 34.4ºC), 2 dBA for ambient temperatures between 75ºF and 84° F (23.9ºC and 28.9ºC), and 3 dBA for ambient temperatures between 65ºF and 74° F (18.3ºC and 23.3ºC).

Sound Isolation

The ultra-low sound level of the AGZ chiller is sufficient for most applications. However, there will be applications where sound generation can be an issue. The most effective isolation method is to 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 water lines, electrical conduit and the unit itself. Use wall sleeves and rubber isolated piping hangers to reduce transmission of water or pump noise into occupied spaces. Use flexible electrical conduit to isolate sound 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.

Optional sound reducing enclosures (or compressor blankets) are available as an option for critical areas.

Pressure Drop Curves

Evaporator pressure drops are in Table 9 on the following page. They apply to either packaged or remote evaporator applications. Table 22, on page 34, contains the evaporator reference letter and the minimum and maximum flows allowed for each unit.

Occasionally the same evaporator is used on multiple units resulting in overlapping lines. The minimum and maximum flows for a given unit will be at the point where the unit reference number appears.

Figure 8, Evaporator Pressure Drops

See following page for curve cross-reference

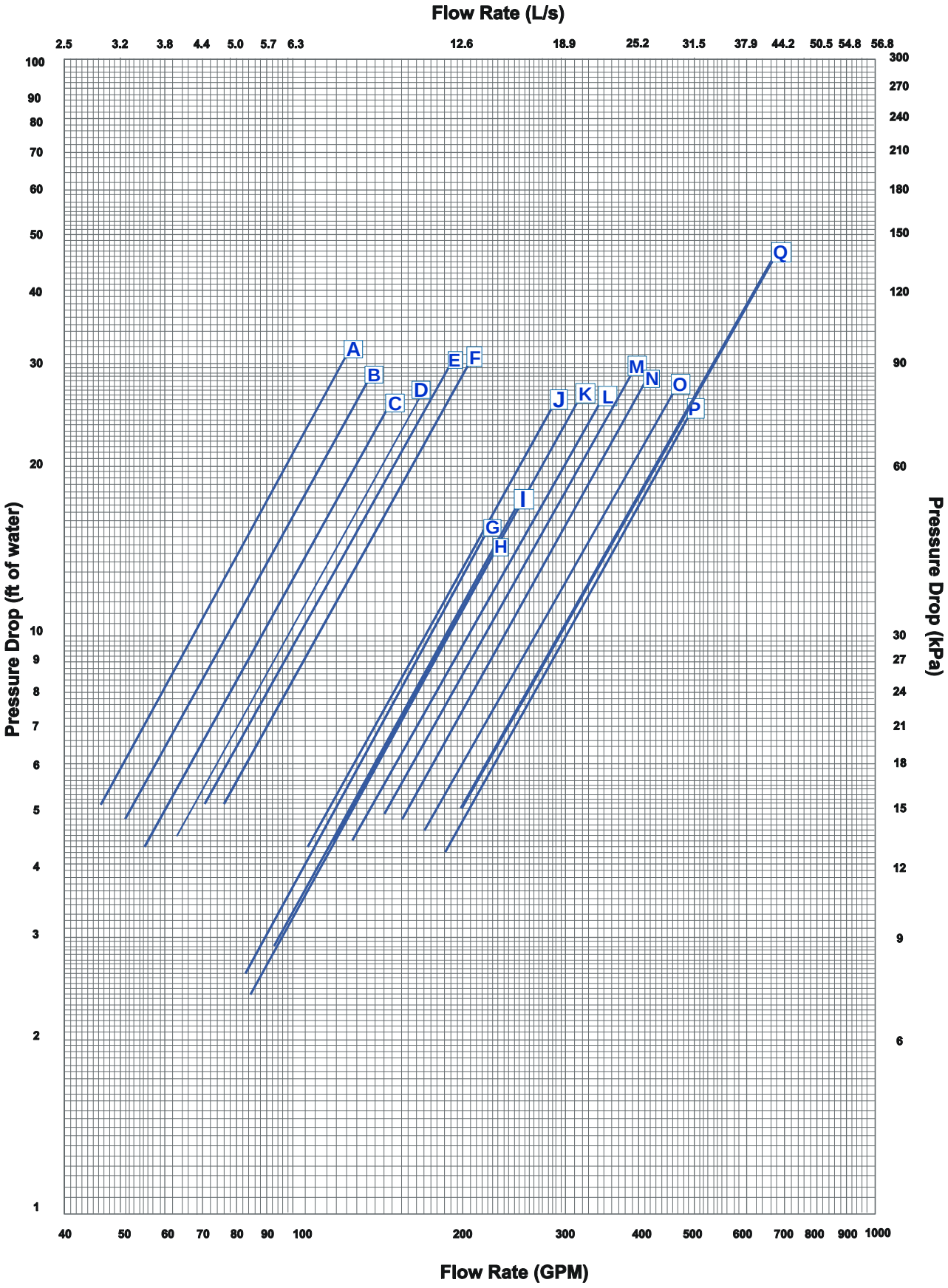


Table 22, Curve Cross-Reference, Min/Nominal/Max Flows

Curve Ref.	AGZ Unit Model	Evap Model	Minimum Flow Rate				Nominal Flow Rate				Maximum Flow Rate				Nom Tons
			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	
A	**030C**	ACH130-90DQ	47.3	5.1	3.0	15.4	75.6	12.0	4.8	35.9	126.0	30.1	8.0	90.0	31.5
B	**035C**	ACH130-102DQ	51.2	4.8	3.2	14.2	81.8	11.1	5.2	33.2	136.4	27.9	8.6	83.3	34.1
C	**040C**	ACH130-118DQ	55.7	4.3	3.5	12.8	89.0	10.0	5.6	29.9	148.4	25.1	9.4	75.0	37.1
D	**045C**	ACH130-138DQ	63.2	4.5	4.0	13.5	101.0	10.5	6.4	31.4	168.4	26.3	10.6	78.7	42.1
E	**050C**	ACH130-158DQ	71.4	5.1	4.5	15.1	114.2	11.8	7.2	35.3	190.4	29.6	12.0	88.5	47.6
F	**055C**	ACH130-178DQ	77.1	5.1	4.9	15.3	123.4	11.9	7.8	35.7	205.6	30.0	13.0	89.6	51.4
G	**060C**	ACH250-110DQ	82.7	2.6	5.2	7.8	132.2	6.1	8.3	18.1	220.4	15.2	13.9	45.4	55.1
H	**065C**	ACH250-122DQ	85.7	2.4	5.4	7.2	137.0	5.6	8.6	16.8	228.4	14.1	14.4	42.0	57.1
I	**070C**	ACH250-122DQ	93.4	2.9	5.9	8.6	149.5	6.8	9.4	20.2	249.1	16.8	15.8	50.5	62.3
J	**075C**	ACH350-118DQ	107.4	4.3	6.8	13.0	171.8	10.1	10.8	30.3	286.4	25.4	18.1	75.9	71.6
K	**080C**	ACH350-126DQ	119.3	4.4	7.5	13.2	190.8	10.3	12.0	30.7	318.0	25.7	20.1	76.9	79.5
L	**090C**	ACH350-142DQ	129.4	4.3	8.1	13.0	207.1	10.1	13.0	30.1	345.2	25.2	21.8	75.5	86.3
M	**100C**	ACH350-150DQ	146.7	4.9	9.2	14.7	234.7	11.4	14.8	34.3	391.2	28.7	24.7	85.9	97.8
N	**110C**	ACH350-162DQ	156.3	4.8	9.9	14.3	250.1	11.1	15.8	33.3	416.8	27.9	26.3	83.5	104.2
O	**125C**	ACH350-182DQ	171.5	4.6	10.8	13.8	274.3	10.8	17.3	32.1	457.2	27.0	28.8	80.6	114.3
P	**130C**	ACH350-210DQ	187.1	4.2	11.8	12.5	299.3	9.8	18.9	29.1	498.8	24.5	31.5	73.1	124.7
Q	**140C**	EV32270099/9	200.6	5.0	12.7	15.0	320.9	11.8	20.2	33.1	534.8	29.5	33.7	88.0	133.7
Q	**160C**	EV32270099/9	227.3	6.3	14.3	18.9	363.6	14.7	22.9	41.5	606.0	36.8	38.2	110.2	151.5
Q	**180C**	EV32270099/9	254.0	7.7	16.0	22.9	406.3	18.0	25.6	50.8	677.2	45.1	42.7	134.6	169.3

NOTE: Evaporators beginning with ACH are brazed-plate, those beginning with EV are shell-and-tube.

Electrical Data

High Ambient Operation

The AGZ-C units for high ambient operation (110ºF, 43.3ºC and above) require the addition of the optional high ambient package that includes a small fan with a filter in the air intake to cool the control panel.

All units with the optional VFD low ambient fan control automatically include the high ambient option. Operation of the VFD generates a quantity of panel heat best removed by use of a control panel fan.

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 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 (Optional)	Std	Opt.	Std	Opt
Multi-Point (Standard)	Std	Opt.	Not Avail.	Opt.

Compressor and Fan Amps

Table 23, Compressor and Fan Amps

AGZ UNIT SIZE	VOLTS	RATED LOAD AMPS						LOCK ROTOR AMPS						FAN MOTORS		
		CIRCUIT #1			CIRCUIT #2			CIRCUIT #1			CIRCUIT #2					
		#1	#3	#5	#2	#4	#6	#1	#3	#5	#2	#4	#6	NO.	FLA	LRA
030	208	31.6	31.6	--	31.6	31.6	--	225	225	--	225	225	--	4	5.8	23.3
	230	30.1	30.1	--	30.1	30.1	--	225	225	--	225	225	--	4	5.8	26.1
	460	16.7	16.7	--	16.7	16.7	--	114	114	--	114	114	--	4	2.8	13.0
	575	13.0	13.0	--	13.0	13.0	--	80	80	--	80	80	--	4	3.0	14.0
035	208	31.6	31.6	--	36.3	36.3	--	225	225	--	239	239	--	4	5.8	23.3
	230	30.1	30.1	--	36.0	36.0	--	225	225	--	239	239	--	4	5.8	26.1
	460	16.7	16.7	--	17.9	17.9	--	114	114	--	125	125	--	4	2.8	13.0
	575	13.0	13.0	--	13.0	13.0	--	80	80	--	80	80	--	4	3.0	14.0
040	208	36.3	36.3	--	36.3	36.3	--	239	239	--	239	239	--	4	5.8	23.3
	230	36.0	36.0	--	36.0	36.0	--	239	239	--	239	239	--	4	5.8	26.1
	460	17.9	17.9	--	17.9	17.9	--	125	125	--	125	125	--	4	2.8	13.0
	575	13.0	13.0	--	13.0	13.0	--	80	80	--	80	80	--	4	3.0	14.0
045	208	48.1	48.1	--	48.1	48.1	--	245	245	--	245	245	--	4	5.8	23.3
	230	48.1	48.1	--	48.1	48.1	--	245	245	--	245	245	--	4	5.8	26.1
	460	18.9	18.9	--	18.9	18.9	--	125	125	--	125	125	--	4	2.8	13.0
	575	15.1	15.1	--	15.1	15.1	--	100	100	--	100	100	--	4	3.0	14.0
050	208	52.8	52.8	--	52.8	52.8	--	300	300	--	300	300	--	4	5.8	23.3
	230	52.8	52.8	--	52.8	52.8	--	300	300	--	300	300	--	4	5.8	26.1
	460	23.1	23.1	--	23.1	23.1	--	150	150	--	150	150	--	4	2.8	13.0
	575	19.9	19.9	--	19.9	19.9	--	109	109	--	109	109	--	4	3.0	14.0
055	208	52.8	52.8	--	56.6	56.6	--	300	300	--	340	340	--	4	5.8	23.3
	230	52.8	52.8	--	55.8	55.8	--	300	300	--	340	340	--	4	5.8	26.1
	460	23.1	23.1	--	26.9	26.9	--	150	150	--	172	172	--	4	2.8	13.0
	575	19.9	19.9	--	23.7	23.7	--	109	109	--	132	132	--	4	3.0	14.0
060	208	56.6	56.6	--	56.6	56.6	--	340	340	--	340	340	--	4	5.8	23.3
	230	55.8	55.8	--	55.8	55.8	--	340	340	--	340	340	--	4	5.8	26.1
	460	26.9	26.9	--	26.9	26.9	--	172	172	--	172	172	--	4	2.8	13.0
	575	23.7	23.7	--	23.7	23.7	--	132	132	--	132	132	--	4	3.0	14.0
065	208	56.6	56.6	--	56.6	56.6	--	340	340	--	340	340	--	4	7.8	31.7
	230	55.8	55.8	--	55.8	55.8	--	340	340	--	340	340	--	4	7.8	35.6
	460	26.9	26.9	--	26.9	26.9	--	172	172	--	172	172	--	4	3.6	17.8
	575	23.7	23.7	--	23.7	23.7	--	132	132	--	132	132	--	4	3.0	14.0
075	208	74.5	74.5	--	74.5	74.5	--	505	505	--	505	505	--	6	7.8	31.7
	230	74.5	74.5	--	74.5	74.5	--	505	505	--	505	505	--	6	7.8	35.6
	460	33.0	33.0	--	33.0	33.0	--	225	225	--	225	225	--	6	3.6	17.8
	575	25.2	25.2	--	25.2	25.2	--	180	180	--	180	180	--	6	3.0	14.0
080	208	74.5	74.5	--	89.1	89.1	--	505	505	--	544	544	--	6	7.8	31.7
	230	74.5	74.5	--	89.1	89.1	--	505	505	--	544	544	--	6	7.8	35.6
	460	33.0	33.0	--	44.5	44.5	--	225	225	--	272	272	--	6	3.6	17.8
	575	25.2	25.2	--	32.1	32.1	--	180	180	--	218	218	--	6	3.0	14.0
090	208	89.1	89.1	--	89.1	89.1	--	544	544	--	544	544	--	6	7.8	31.7
	230	89.1	89.1	--	89.1	89.1	--	544	544	--	544	544	--	6	7.8	35.6
	460	44.5	44.5	--	44.5	44.5	--	272	272	--	272	272	--	6	3.6	17.8
	575	32.1	32.1	--	32.1	32.1	--	218	218	--	218	218	--	6	3.0	14.0

Continued next page.

AGZ UNIT SIZE	VOLTS	RATED LOAD AMPS						LOCK ROTOR AMPS						FAN MOTORS		
		CIRCUIT #1			CIRCUIT #2			CIRCUIT #1			CIRCUIT #2					
		#1	#3	#5	#2	#4	#6	#1	#3	#5	#2	#4	#6	NO.	FLA	LRA
100	208	89.1	115.5	--	89.1	115.5	--	544	599	--	544	599	--	6	7.8	31.7
	230	89.1	115.5	--	89.1	115.5	--	544	599	--	544	599	--	6	7.8	35.6
	460	43.0	54.5	--	43.0	54.5	--	272	310	--	272	310	--	6	3.6	17.8
	575	32.1	44.5	--	32.1	44.5	--	218	239	--	218	239	--	6	3.0	14.0
110	208	74.5	74.5	74.5	74.5	74.5	74.5	505	505	505	505	505	505	8	7.8	31.7
	230	74.5	74.5	74.5	74.5	74.5	74.5	505	505	505	505	505	505	8	7.8	35.6
	460	30.6	30.6	30.6	30.6	30.6	30.6	225	225	225	225	225	225	8	3.6	17.8
	575	25.2	25.2	25.2	25.2	25.2	25.2	180	180	180	180	180	180	8	3.0	14.0
125	208	86.3	86.3	86.3	89.1	89.1	89.1	505	505	505	544	544	544	8	7.8	31.7
	230	86.3	86.3	86.3	89.1	89.1	89.1	505	505	505	544	544	544	8	7.8	35.6
	460	30.6	30.6	30.6	44.5	44.5	44.5	225	225	225	272	272	272	8	3.6	17.8
	575	25.2	25.2	25.2	32.1	32.1	32.1	180	180	180	218	218	218	8	3.0	14.0
130	208	89.1	89.1	89.1	89.1	89.1	89.1	544	544	544	544	544	544	8	7.8	31.7
	230	89.1	89.1	89.1	89.1	89.1	89.1	544	544	544	544	544	544	8	7.8	35.6
	460	44.5	44.5	44.5	44.5	44.5	44.5	272	272	272	272	272	272	8	3.6	17.8
	575	32.1	32.1	32.1	32.1	32.1	32.1	218	218	218	218	218	218	8	3.0	14.0
140	208	89.1	89.1	89.1	89.1	89.1	89.1	544	544	544	544	544	544	10	7.8	31.7
	230	89.1	89.1	89.1	89.1	89.1	89.1	544	544	544	544	544	544	10	7.8	35.6
	460	44.5	44.5	44.5	44.5	44.5	44.5	272	272	272	272	272	272	10	3.6	17.8
	575	32.1	32.1	32.1	32.1	32.1	32.1	218	218	218	218	218	218	10	3.0	14.0
160	208	89.1	89.1	89.1	115.5	115.5	115.5	544	544	544	599	599	599	10	7.8	31.7
	230	89.1	89.1	89.1	115.5	115.5	115.5	544	544	544	599	599	599	10	7.8	35.6
	460	44.5	44.5	44.5	54.5	54.5	54.5	272	272	272	310	310	310	10	3.6	17.8
	575	32.1	32.1	32.1	44.5	44.5	44.5	218	218	218	239	239	239	10	3.0	14.0
180	208	127.5	127.5	127.5	127.5	127.5	127.5	599	599	599	599	599	599	10	7.8	31.7
	230	115.5	115.5	115.5	115.5	115.5	115.5	599	599	599	599	599	599	10	7.8	35.6
	460	57.2	57.2	57.2	57.2	57.2	57.2	310	310	310	310	310	310	10	3.6	17.8
	575	44.5	44.5	44.5	44.5	44.5	44.5	239	239	239	239	239	239	10	3.0	14.0

Electric Data, Single Point

Table 24, Electric Data, Single Point

AGZ UNIT SIZE	VOLTS	PUMP MOTOR HP	MIN. CIRCUIT AMPACITY (MCA)	POWER SUPPLY				FIELD FUSE SIZE OR MAX. CKT. BREAKER	
				FIELD WIRE		FIELD SUPPLIED HUB (IN.)			
				QTY	WIRE GA	QTY	NOM. SIZE	RECOM.	MAX.
030	208	None	158	3	2/0 AWG	1	1.50	175	175
	230	None	152	3	2/0 AWG	1	1.50	175	175
	460	None	83	3	4 AWG	1	1.00	90	90
	575	None	68	3	4 AWG	1	1.00	80	80
035	208	None	169	3	2/0 AWG	1	1.50	200	200
	230	None	165	3	2/0 AWG	1	1.50	200	200
	460	None	85	3	4 AWG	1	1.00	100	100
	575	None	68	3	4 AWG	1	1.00	80	80
040	208	None	178	3	3/0 AWG	1	2.00	200	200
	230	None	177	3	3/0 AWG	1	2.00	200	200
	460	None	88	3	3 AWG	1	1.00	100	100
	575	None	68	3	4 AWG	1	1.00	80	80
045	208	None	228	3	4/0 AWG	1	2.00	250	250
	230	None	228	3	4/0 AWG	1	2.00	250	250
	460	None	92	3	3 AWG	1	1.00	110	110
	575	None	77	3	4 AWG	1	1.00	90	90
050	208	None	248	3	250 MCM	1	2.00	300	300
	230	None	248	3	250 MCM	1	2.00	300	300
	460	None	110	3	2 AWG	1	1.25	125	125
	575	None	97	3	3 AWG	1	1.00	110	110
055	208	None	257	3	300 MCM	1	2.50	300	300
	230	None	255	3	250 MCM	1	2.50	300	300
	460	None	118	3	1 AWG	1	1.25	125	125
	575	None	106	3	2 AWG	1	1.25	125	125
060	208	None	264	3	300 MCM	1	2.50	300	300
	230	None	261	3	300 MCM	1	2.50	300	300
	460	None	126	3	1 AWG	1	1.25	150	150
	575	None	113	3	2 AWG	1	1.25	125	125
065	208	None	272	3	300 MCM	1	2.50	300	300
	230	None	269	3	300 MCM	1	2.50	300	300
	460	None	129	3	1 AWG	1	1.25	150	150
	575	None	113	3	2 AWG	1	1.25	125	125
070	208	None	313	3	400 MCM	1	2.50	350	350
	230	None	311	3	400 MCM	1	2.50	350	350
	460	None	143	3	1/0 AWG	1	1.50	175	175
	575	None	117	3	1 AWG	1	1.25	125	125
075	208	None	364	6	4/0 AWG	1	3.00	400	400
	230	None	364	6	4/0 AWG	1	3.00	400	400
	460	None	162	3	2/0 AWG	1	1.50	175	175
	575	None	126	3	1 AWG	1	1.25	150	150
080	208	None	397	6	250 MCM	1	3.00	450	450
	230	None	397	6	250 MCM	1	3.00	450	450
	460	None	188	3	3/0 AWG	1	2.00	225	225
	575	None	141	3	1/0 AWG	1	1.50	150	150

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AGZ UNIT SIZE	VOLTS	PUMP MOTOR HP	MIN. CIRCUIT AMPACITY (MCA)	POWER SUPPLY				FIELD FUSE SIZE OR MAX. CKT. BREAKER	
				FIELD WIRE		FIELD SUPPLIED HUB (IN.)			
				QTY	WIRE GA	QTY	NOM. SIZE	RECOM.	MAX.
090	208	None	426	6	300 MCM	1	3.50	500	500
	230	None	426	6	300 MCM	1	3.50	500	500
	460	None	211	3	4/0 AWG	1	2.00	250	250
	575	None	155	3	2/0 AWG	1	1.50	175	175
100	208	None	485	6	350 MCM	1	3.50	600	600
	230	None	485	6	350 MCM	1	3.50	600	600
	460	None	230	3	4/0 AWG	1	2.00	250	250
	575	None	183	3	3/0 AWG	1	2.00	225	225
110	208	None	529	6	300 MCM	2	2.50	600	600
	230	None	529	6	300 MCM	2	2.50	600	600
	460	None	221	3	4/0 AWG	1	2.00	250	250
	575	None	182	3	3/0 AWG	1	2.00	200	200
125	208	None	611	6	350 MCM	2	2.50	700	700
	230	None	611	6	350 MCM	2	2.50	700	700
	460	None	266	3	300 MCM	1	2.50	300	300
	575	None	204	3	4/0 AWG	1	2.00	225	225
130	208	None	620	6	350 MCM	2	2.50	700	700
	230	None	620	6	350 MCM	2	2.50	700	700
	460	None	307	3	350 MCM	1	2.50	350	350
	575	None	225	3	4/0 AWG	1	2.00	250	250
140	208	None	635	6	400 MCM	2	2.50	700	700
	230	None	635	6	400 MCM	2	2.50	700	700
	460	None	315	3	400 MCM	1	2.50	350	350
	575	None	231	3	250 MCM	1	2.00	250	250
160	208	None	721	12	250 MCM	2	3.00	800	800
	230	None	721	12	250 MCM	2	3.00	800	800
	460	None	347	6	4/0 AWG	1	3.00	400	400
	575	None	271	3	300 MCM	1	2.50	300	300
180	208	None	875	12	300 MCM	2	3.50	1000	1000
	230	None	800	12	250 MCM	2	3.00	800	800
	460	None	394	6	250 MCM	1	3.00	450	450
	575	None	309	3	350 MCM	1	2.50	350	350

Wiring Data, Single Point

Table 25, Wiring Data, Single Point

AGZ UNIT SIZE	VOLTS	POWER BLOCK		HIGH SCCR CIRCUIT BREAKER		DISCONNECT SWITCH	
		SIZE	LUG RANGE	SIZE	LUG RANGE	SIZE	LUG RANGE
030	208	175	(1) 2/0 - #14	175	(1) 350 - #4	250	(1) 350 - #4
	230	175	(1) 2/0 - #14	175	(1) 350 - #4	250	(1) 350 - #4
	460	175	(1) 2/0 - #14	90	(1) 1/0- #10	100	(1) 1/0 - #10
	575	175	(1) 2/0 - #14	80	(1) 1/0- #10	100	(1) 1/0 - #10
035	208	380	(1) 500 - #4	200	(1) 350 - #4	250	(1) 350 - #4
	230	380	(1) 500 - #4	200	(1) 350 - #4	250	(1) 350 - #4
	460	175	(1) 2/0 - #14	100	(1) 1/0- #10	100	(1) 1/0 - #10
	575	175	(1) 2/0 - #14	80	(1) 1/0- #10	100	(1) 1/0 - #10
040	208	380	(1) 500 - #4	200	(1) 350 - #4	250	(1) 350 - #4
	230	380	(1) 500 - #4	200	(1) 350 - #4	250	(1) 350 - #4
	460	175	(1) 2/0 - #14	100	(1) 1/0- #10	125	(1) 3/0- #3
	575	175	(1) 2/0 - #14	80	(1) 1/0- #10	100	(1) 1/0 - #10
045	208	380	(1) 500 - #4	250	(1) 350 - #4	400	(2) 500- 3/0
	230	380	(1) 500 - #4	250	(1) 350 - #4	400	(2) 500- 3/0
	460	175	(1) 2/0 - #14	110	(1) 3/0- #3	125	(1) 3/0- #3
	575	175	(1) 2/0 - #14	90	(1) 1/0- #10	100	(1) 1/0 - #10
050	208	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
	230	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
	460	175	(1) 2/0 - #14	125	(1) 3/0- #3	125	(1) 3/0- #3
	575	175	(1) 2/0 - #14	110	(1) 3/0- #3	125	(1) 3/0- #3
055	208	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
	230	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
	460	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
	575	175	(1) 2/0 - #14	125	(1) 3/0- #3	125	(1) 3/0- #3
060	208	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
	230	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
	460	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4
	575	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
065	208	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
	230	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
	460	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4
	575	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
070	208	760	(2) 500 - #4	350	(2) 500- 3/0	400	(2) 500- 3/0
	230	760	(2) 500 - #4	350	(2) 500- 3/0	400	(2) 500- 3/0
	460	175	(1) 2/0 - #14	175	(1) 350 - #4	250	(1) 350 - #4
	575	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
075	208	760	(2) 500 - #4	400	(2) 500- 3/0	600	(2) 500- 3/0
	230	760	(2) 500 - #4	400	(2) 500- 3/0	600	(2) 500- 3/0
	460	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
	575	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4
080	208	760	(2) 500 - #4	450	(2) 500- 3/0	600	(2) 500- 3/0
	230	760	(2) 500 - #4	450	(2) 500- 3/0	600	(2) 500- 3/0
	460	380	(1) 500 - #4	225	(1) 350 - #4	250	(1) 350 - #4
	575	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4

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AGZ UNIT SIZE	VOLTS	POWER BLOCK		HIGH SCCR CIRCUIT BREAKER		DISCONNECT SWITCH	
		SIZE	LUG RANGE	SIZE	LUG RANGE	SIZE	LUG RANGE
090	208	760	(2) 500 - #4	500	(2) 500- 3/0	600	(2) 500- 3/0
	230	760	(2) 500 - #4	500	(2) 500- 3/0	600	(2) 500- 3/0
	460	380	(1) 500 - #4	250	(1) 350 - #4	250	(1) 350 - #4
	575	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
100	208	760	(2) 500 - #4	600	(2) 500- 3/0	600	(2) 500- 3/0
	230	760	(2) 500 - #4	600	(2) 500- 3/0	600	(2) 500- 3/0
	460	380	(1) 500 - #4	250	(1) 350 - #4	400	(2) 500- 3/0
	575	380	(1) 500 - #4	225	(1) 350 - #4	250	(1) 350 - #4
110	208	760	(2) 500 - #4	600	(2) 500- 3/0	800	(4) 500- 250
	230	760	(2) 500 - #4	600	(2) 500- 3/0	800	(4) 500- 250
	460	380	(1) 500 - #4	250	(1) 350 - #4	400	(2) 500- 3/0
	575	380	(1) 500 - #4	200	(1) 350 - #4	250	(1) 350 - #4
125	208	760	(2) 500 - #4	700	(4) 500- 250	800	(4) 500- 250
	230	760	(2) 500 - #4	700	(4) 500- 250	800	(4) 500- 250
	460	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
	575	380	(1) 500 - #4	225	(1) 350 - #4	250	(1) 350 - #4
130	208	760	(2) 500 - #4	700	(4) 500- 250	800	(4) 500- 250
	230	760	(2) 500 - #4	700	(4) 500- 250	800	(4) 500- 250
	460	380	(1) 500 - #4	350	(2) 500- 3/0	400	(2) 500- 3/0
	575	380	(1) 500 - #4	250	(1) 350 - #4	400	(2) 500- 3/0
140	208	760	(2) 500 - #4	700	(4) 500- 250	800	(4) 500- 250
	230	760	(2) 500 - #4	700	(4) 500- 250	800	(4) 500- 250
	460	380	(1) 500 - #4	350	(2) 500- 3/0	400	(2) 500- 3/0
	575	380	(1) 500 - #4	250	(1) 350 - #4	400	(2) 500- 3/0
160	208	1000	(4) 500- 250	800	(4) 500- 250	1000	(4) 500- 250
	230	1000	(4) 500- 250	800	(4) 500- 250	1000	(4) 500- 250
	460	760	(2) 500 - #4	400	(2) 500- 3/0	600	(2) 500- 3/0
	575	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
180	208	1000	(4) 500- 250	1000	(4) 500- 250	1000	(4) 500- 250
	230	1000	(4) 500- 250	800	(4) 500- 250	1000	(4) 500- 250
	460	760	(2) 500 - #4	450	(2) 500- 3/0	600	(2) 500- 3/0
	575	380	(1) 500 - #4	350	(2) 500- 3/0	400	(2) 500- 3/0

Electrical Data, Multi-Point

Table 26, Electrical Data, Multi-Point

AGZ UNIT SIZE	CIR-CUIT	VOLTS	HZ	MIN. CIRCUIT AMPACITY (MCA)	POWER SUPPLY				FIELD FUSE SIZE OR MAX. CKT. BREAKER	
					FIELD WIRE		FIELD SUPPLIED HUB (IN.)			
					QTY	WIRE GA	QTY	NOM. SIZE	RECOM.	MAX.
030	1	208	60	83	3	3 AWG	1	1.0	110	110
		230		80	3	3 AWG	1	1.0	100	100
		460		44	3	8 AWG	1	0.5	60	60
		575		36	3	8 AWG	1	0.5	45	45
030	2	208	60	83	3	3 AWG	1	1.0	110	110
		230		80	3	3 AWG	1	1.0	110	110
		460		44	3	8 AWG	1	0.5	60	60
		575		36	3	8 AWG	1	0.5	45	45
035	1	208	60	83	3	3 AWG	1	1.0	110	110
		230		80	3	3 AWG	1	1.0	100	100
		460		44	3	8 AWG	1	0.5	60	60
		575		36	3	8 AWG	1	0.5	45	45
035	2	208	60	94	3	3 AWG	1	1.0	125	125
		230		93	3	3 AWG	1	1.0	125	125
		460		46	3	8 AWG	1	0.5	60	60
		575		36	3	8 AWG	1	0.5	45	45
040	1	208	60	94	3	3 AWG	1	1.0	125	125
		230		93	3	3 AWG	1	1.0	125	125
		460		46	3	8 AWG	1	0.5	60	60
		575		36	3	8 AWG	1	0.5	45	45
040	2	208	60	94	3	3 AWG	1	1.0	125	125
		230		93	3	3 AWG	1	1.0	125	125
		460		46	3	8 AWG	1	0.5	60	60
		575		36	3	8 AWG	1	0.5	45	45
045	1	208	60	120	3	1 AWG	1	1.3	150	150
		230		120	3	1 AWG	1	1.3	150	150
		460		49	3	8 AWG	1	0.5	60	60
		575		40	3	8 AWG	1	0.5	50	50
045	2	208	60	120	3	1 AWG	1	1.3	150	150
		230		120	3	1 AWG	1	1.3	150	150
		460		49	3	8 AWG	1	0.5	60	60
		575		40	3	8 AWG	1	0.5	50	50
050	1	208	60	131	3	1/0 AWG	1	1.5	175	175
		230		131	3	1/0 AWG	1	1.5	175	175
		460		58	3	6 AWG	1	0.8	80	80
		575		51	3	6 AWG	1	0.8	70	70
050	2	208	60	131	3	1/0 AWG	1	1.5	175	175
		230		131	3	1/0 AWG	1	1.5	175	175
		460		58	3	6 AWG	1	0.8	80	80
		575		51	3	6 AWG	1	0.8	70	70

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AGZ UNIT SIZE	CIR-CUIT	VOLTS	HZ	MIN. CIRCUIT AMPACITY (MCA)	POWER SUPPLY				FIELD FUSE SIZE OR MAX. CKT. BREAKER	
					FIELD WIRE		HUB, FIELD SUPPLIED (IN.)			
					QTY	WIRE GA	QTY	NOM. SIZE	RECOM.	MAX.
055	**1**	208	60	131	3	1/0 AWG	1	1.5	175	175
		230		131	3	1/0 AWG	1	1.5	175	175
		460		58	3	6 AWG	1	0.8	80	80
		575		51	3	6 AWG	1	0.8	70	70
055	**2**	208	60	139	3	1/0 AWG	1	1.5	175	175
		230		138	3	1/0 AWG	1	1.5	175	175
		460		67	3	4 AWG	1	1.0	90	90
		575		60	3	6 AWG	1	0.8	80	80
060	**1**	208	60	139	3	1/0 AWG	1	1.5	175	175
		230		138	3	1/0 AWG	1	1.5	175	175
		460		67	3	4 AWG	1	1.0	90	90
		575		60	3	6 AWG	1	0.8	80	80
060	**2**	208	60	139	3	1/0 AWG	1	1.5	175	175
		230		138	3	1/0 AWG	1	1.5	175	175
		460		67	3	4 AWG	1	1.0	90	90
		575		60	3	6 AWG	1	0.8	80	80
065	**1**	208	60	143	3	1/0 AWG	1	1.5	175	175
		230		142	3	1/0 AWG	1	1.5	175	175
		460		68	3	4 AWG	1	1.0	90	90
		575		60	3	6 AWG	1	0.8	80	80
065	**2**	208	60	143	3	1/0 AWG	1	1.5	200	200
		230		142	3	1/0 AWG	1	1.5	175	175
		460		68	3	4 AWG	1	1.0	90	90
		575		60	3	6 AWG	1	0.8	80	80
070	**1**	208	60	166	3	2/0 AWG	1	1.5	225	225
		230		165	3	2/0 AWG	1	1.5	225	225
		460		76	3	4 AWG	1	1.0	100	100
		575		62	3	6 AWG	1	0.8	80	80
070	**2**	208	60	166	3	2/0 AWG	1	1.5	225	225
		230		165	3	2/0 AWG	1	1.5	225	225
		460		76	3	4 AWG	1	1.0	100	100
		575		62	3	6 AWG	1	0.8	80	80
075	**1**	208	60	192	3	3/0 AWG	1	2.0	250	250
		230		192	3	3/0 AWG	1	2.0	250	250
		460		86	3	3 AWG	1	1.0	110	110
		575		66	3	4 AWG	1	1.0	90	90
075	**2**	208	60	192	3	3/0 AWG	1	2.0	250	250
		230		192	3	3/0 AWG	1	2.0	250	250
		460		86	3	3 AWG	1	1.0	110	110
		575		66	3	4 AWG	1	1.0	90	90

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AGZ UNIT SIZE	CIR-CUIT	VOLTS	HZ	MIN. CIRCUIT AMPACITY (MCA)	POWER SUPPLY				FIELD FUSE SIZE OR MAX. CKT. BREAKER	
					FIELD WIRE		HUB, FIELD SUPPLIED (IN.)			
					QTY	WIRE GA	QTY	NOM. SIZE	RECOM.	MAX.
080	1	208	60	192	3	3/0 AWG	1	2.0	250	250
		230		192	3	3/0 AWG	1	2.0	250	250
		460		86	3	3 AWG	1	1.0	110	110
		575		66	3	4 AWG	1	1.0	90	90
080	2	208	60	224	3	4/0 AWG	1	2.0	300	300
		230		224	3	4/0 AWG	1	2.0	300	300
		460		111	3	2 AWG	1	1.3	150	150
		575		82	3	4 AWG	1	1.0	110	110
090	1	208	60	224	3	4/0 AWG	1	2.0	300	300
		230		224	3	4/0 AWG	1	2.0	300	300
		460		111	3	2 AWG	1	1.3	150	150
		575		82	3	3 AWG	1	1.0	110	110
090	2	208	60	224	3	4/0 AWG	1	2.0	300	300
		230		224	3	4/0 AWG	1	2.0	300	300
		460		111	3	2 AWG	1	1.3	150	150
		575		82	3	3 AWG	1	1.0	110	110
100	1	208	60	257	3	300 MCM	1	2.5	350	350
		230		257	3	300 MCM	1	2.5	350	350
		460		122	3	1 AWG	1	1.3	175	175
		575		97	3	3 AWG	1	1.0	125	125
100	2	208	60	257	3	300 MCM	1	2.5	350	350
		230		257	3	300 MCM	1	2.5	350	350
		460		122	3	1 AWG	1	1.3	175	175
		575		97	3	3 AWG	1	1.0	125	125
110	1	208	60	274	3	300 MCM	1	2.5	300	300
		230		274	3	300 MCM	1	2.5	300	300
		460		114	3	2 AWG	1	1.3	125	125
		575		94	3	3 AWG	1	1.0	110	110
110	2	208	60	274	3	300 MCM	1	2.5	300	300
		230		274	3	300 MCM	1	2.5	300	300
		460		114	3	2 AWG	1	1.3	125	125
		575		94	3	3 AWG	1	1.0	110	110
125	1	208	60	312	3	400 MCM	1	2.5	350	350
		230		312	3	400 MCM	1	2.5	350	350
		460		114	3	2 AWG	1	1.3	125	125
		575		94	3	3 AWG	1	1.0	110	110
125	2	208	60	321	3	400 MCM	1	2.5	400	400
		230		321	3	400 MCM	1	2.5	400	400
		460		160	3	2/0 AWG	1	1.5	200	200
		575		117	3	1 AWG	1	1.3	125	125
130	1	208	60	321	3	400 MCM	1	2.5	400	400
		230		321	3	400 MCM	1	2.5	400	400
		460		160	3	2/0 AWG	1	1.5	200	200
		575		117	3	1 AWG	1	1.3	125	125
130	2	208	60	321	3	400 MCM	1	2.5	400	400
		230		321	3	400 MCM	1	2.5	400	400
		460		160	3	2/0 AWG	1	1.5	200	200
		575		117	3	1 AWG	1	1.3	125	125

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AGZ UNIT SIZE	CIR-CUIT	VOLTS	HZ	MIN. CIRCUIT AMPACITY (MCA)	POWER SUPPLY				FIELD FUSE SIZE OR MAX. CKT. BREAKER	
					FIELD WIRE		HUB, FIELD SUPPLIED (IN.)			
					QTY	WIRE GA	QTY	NOM. SIZE	RECOM.	MAX.
140	**1**	208	60	321	3	400 MCM	1	2.5	400	400
		230		321	3	400 MCM	1	2.5	400	400
		460		160	3	2/0 AWG	1	1.5	200	200
		575		117	3	1 AWG	1	1.3	125	125
140	**2**	208	60	321	3	400 MCM	1	2.5	400	400
		230		321	3	400 MCM	1	2.5	400	400
		460		160	3	2/0 AWG	1	1.5	200	200
		575		117	3	1 AWG	1	1.3	125	125
160	**1**	208	60	329	3	400 MCM	1	2.5	400	400
		230		329	3	400 MCM	1	2.5	400	400
		460		163	3	2/0 AWG	1	1.5	200	200
		575		120	3	1 AWG	1	1.3	150	150
160	**2**	208	60	415	6	300 MCM	1	3.5	500	500
		230		415	6	300 MCM	1	3.5	500	500
		460		196	3	3/0 AWG	1	2.0	250	250
		575		160	3	2/0 AWG	1	1.5	200	200
180	**1**	208	60	454	6	300 MCM	1	3.5	500	500
		230		415	6	300 MCM	1	3.5	500	500
		460		204	3	4/0 AWG	1	2.0	250	250
		575		160	3	2/0 AWG	1	1.5	200	200
180	**2**	208	60	454	6	300 MCM	1	3.5	500	500
		230		415	6	300 MCM	1	3.5	500	500
		460		204	3	4/0 AWG	1	2.0	250	250
		575		160	3	2/0 AWG	1	1.5	200	200

Wiring Data, Multi-Point

Table 27, Wiring Data, Multi-Point

AGZ UNIT SIZE	CIR-CUIT	VOLTS	POWER BLOCK		HIGH SCCR CIRCUIT BREAKER		DISCONNECT SWITCH	
			SIZE	LUG RANGE	SIZE	LUG RANGE	SIZE	LUG RANGE
030	1	208	175	(1) 2/0 - #14	110	(1) 3/0- #3	100	(1) 1/0 - #10
		230	175	(1) 2/0 - #14	100	(1) 1/0 - #10	100	(1) 1/0 - #10
		460	175	(1) 2/0 - #14	60	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	45	(1) 1/0 - #10	100	(1) 1/0 - #10
030	2	208	175	(1) 2/0 - #14	110	(1) 3/0- #3	100	(1) 1/0 - #10
		230	175	(1) 2/0 - #14	100	(1) 1/0 - #10	100	(1) 1/0 - #10
		460	175	(1) 2/0 - #14	60	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	45	(1) 1/0 - #10	100	(1) 1/0 - #10
035	1	208	175	(1) 2/0 - #14	110	(1) 3/0- #3	100	(1) 1/0 - #10
		230	175	(1) 2/0 - #14	100	(1) 3/0- #3	100	(1) 1/0 - #10
		460	175	(1) 2/0 - #14	60	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	45	(1) 1/0 - #10	100	(1) 1/0 - #10
035	2	208	175	(1) 2/0 - #14	125	(1) 3/0- #3	125	(1) 3/0- #3
		230	175	(1) 2/0 - #14	125	(1) 3/0- #3	125	(1) 3/0- #3
		460	175	(1) 2/0 - #14	60	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	45	(1) 1/0 - #10	100	(1) 1/0 - #10
040	1	208	175	(1) 2/0 - #14	125	(1) 3/0- #3	125	(1) 3/0- #3
		230	175	(1) 2/0 - #14	125	(1) 3/0- #3	125	(1) 3/0- #3
		460	175	(1) 2/0 - #14	60	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	45	(1) 1/0 - #10	100	(1) 1/0 - #10
040	2	208	175	(1) 2/0 - #14	125	(1) 3/0- #3	125	(1) 3/0- #3
		230	175	(1) 2/0 - #14	125	(1) 3/0- #3	125	(1) 3/0- #3
		460	175	(1) 2/0 - #14	60	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	45	(1) 1/0 - #10	100	(1) 1/0 - #10
045	1	208	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4
		230	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	60	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	50	(1) 1/0 - #10	100	(1) 1/0 - #10
045	2	208	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4
		230	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	60	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	50	(1) 1/0 - #10	100	(1) 1/0 - #10
050	1	208	175	(1) 2/0 - #14	175	(1) 350 - #4	250	(1) 350 - #4
		230	175	(1) 2/0 - #14	175	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	80	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	70	(1) 1/0 - #10	100	(1) 1/0 - #10
050	2	208	175	(1) 2/0 - #14	175	(1) 350 - #4	250	(1) 350 - #4
		230	175	(1) 2/0 - #14	175	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	80	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	70	(1) 1/0 - #10	100	(1) 1/0 - #10
055	1	208	175	(1) 2/0 - #14	175	(1) 350 - #4	250	(1) 350 - #4
		230	175	(1) 2/0 - #14	175	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	80	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	70	(1) 1/0 - #10	100	(1) 1/0 - #10
055	2	208	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
		230	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	90	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	80	(1) 1/0 - #10	100	(1) 1/0 - #10

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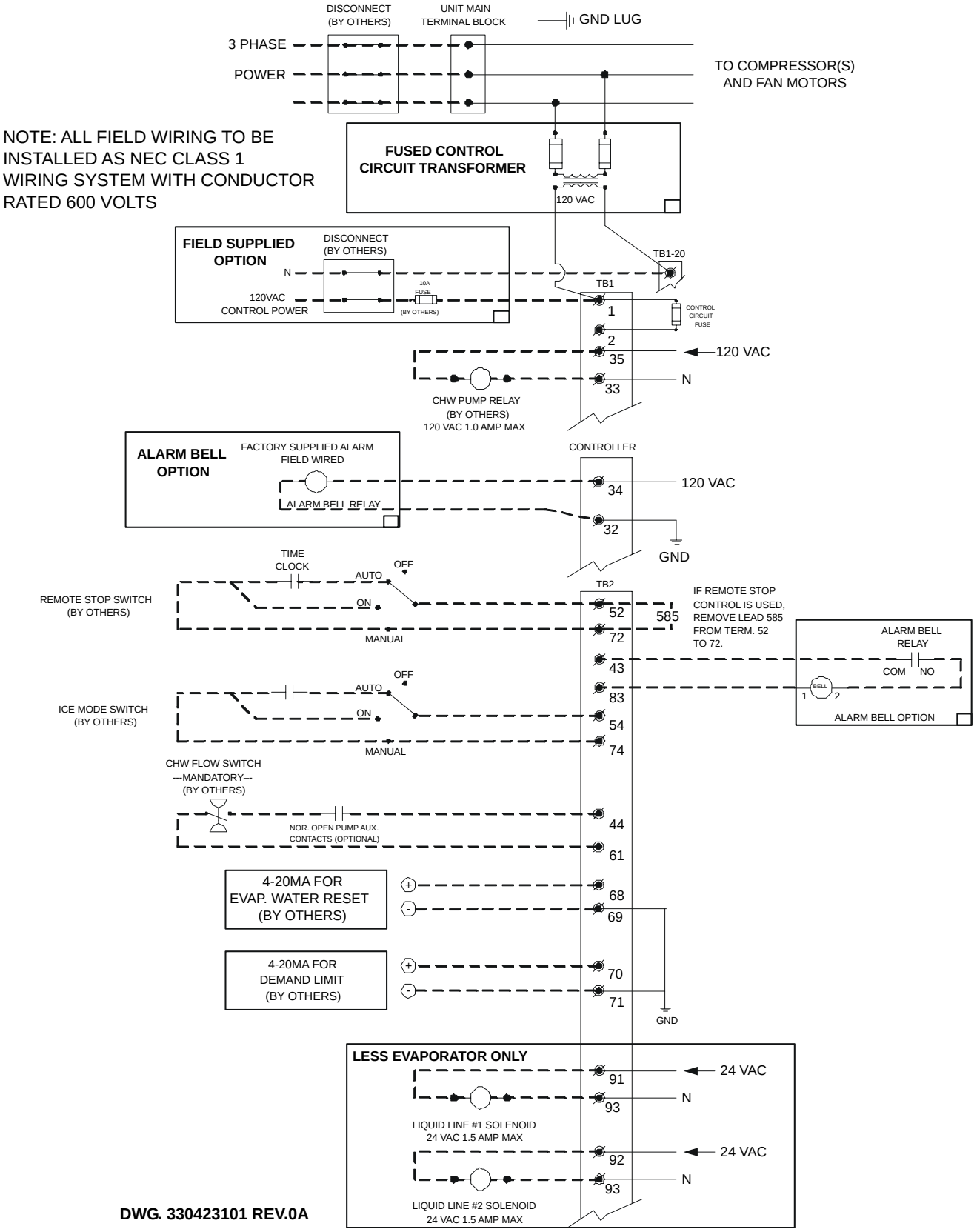
AGZ UNIT SIZE	CIR-CUIT	VOLTS	POWER BLOCK		HIGH SCCR CIRCUIT BREAKER		DISCONNECT SWITCH	
			SIZE	LUG RANGE	SIZE	LUG RANGE	SIZE	LUG RANGE
060	1	208	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
		230	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	90	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	80	(1) 1/0 - #10	100	(1) 1/0 - #10
060	2	208	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
		230	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	90	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	80	(1) 1/0 - #10	100	(1) 1/0 - #10
065	1	208	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
		230	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	90	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	80	(1) 1/0 - #10	100	(1) 1/0 - #10
065	2	208	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
		230	380	(1) 500 - #4	175	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	90	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	80	(1) 1/0 - #10	100	(1) 1/0 - #10
070	1	208	380	(1) 500 - #4	225	(1) 350 - #4	250	(1) 350 - #4
		230	380	(1) 500 - #4	225	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	100	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	80	(1) 1/0 - #10	100	(1) 1/0 - #10
070	2	208	380	(1) 500 - #4	225	(1) 350 - #4	250	(1) 350 - #4
		230	380	(1) 500 - #4	225	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	100	(1) 1/0 - #10	100	(1) 1/0 - #10
		575	175	(1) 2/0 - #14	80	(1) 1/0 - #10	100	(1) 1/0 - #10
075	1	208	380	(1) 500 - #4	250	(1) 350 - #4	250	(1) 350 - #4
		230	380	(1) 500 - #4	250	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	110	(1) 3/0- #3	125	(1) 3/0- #3
		575	175	(1) 2/0 - #14	90	(1) 1/0 - #10	100	(1) 1/0 - #10
075	2	208	380	(1) 500 - #4	250	(1) 350 - #4	250	(1) 350 - #4
		230	380	(1) 500 - #4	250	(1) 350 - #4	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	110	(1) 3/0- #3	125	(1) 3/0- #3
		575	175	(1) 2/0 - #14	90	(1) 1/0 - #10	100	(1) 1/0 - #10
080	1	208	380	(1) 500 - #4	250	(2) 500- 3/0	250	(1) 350 - #4
		230	380	(1) 500 - #4	250	(2) 500- 3/0	250	(1) 350 - #4
		460	175	(1) 2/0 - #14	110	(1) 3/0- #3	125	(1) 3/0- #3
		575	175	(1) 2/0 - #14	90	(1) 1/0 - #10	100	(1) 1/0 - #10
080	2	208	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
		230	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
		460	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	110	(1) 3/0- #3	125	(1) 3/0- #3
090	1	208	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
		230	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
		460	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	110	(1) 3/0- #3	125	(1) 3/0- #3
090	2	208	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
		230	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
		460	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	110	(1) 3/0- #3	125	(1) 3/0- #3

Continued next page

AGZ UNIT SIZE	CIR-CUIT	VOLTS	POWER BLOCK		HIGH SCCR CIRCUIT BREAKER		DISCONNECT SWITCH	
			SIZE	LUG RANGE	SIZE	LUG RANGE	SIZE	LUG RANGE
100	1	208	380	(1) 500 - #4	350	(2) 500- 3/0	400	(2) 500- 3/0
		230	380	(1) 500 - #4	350	(2) 500- 3/0	400	(2) 500- 3/0
		460	175	(1) 2/0 - #14	175	(1) 350 - #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	125	(1) 3/0- #3	125	(1) 3/0- #3
100	2	208	380	(1) 500 - #4	350	(2) 500- 3/0	400	(2) 500- 3/0
		230	380	(1) 500 - #4	350	(2) 500- 3/0	400	(2) 500- 3/0
		460	175	(1) 2/0 - #14	175	(1) 350 - #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	125	(1) 3/0- #3	125	(1) 3/0- #3
110	1	208	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
		230	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
		460	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	110	(1) 3/0- #3	125	(1) 3/0- #3
110	2	208	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
		230	380	(1) 500 - #4	300	(2) 500- 3/0	400	(2) 500- 3/0
		460	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	110	(1) 3/0- #3	125	(1) 3/0- #3
125	1	208	760	(2) 500 - #4	350	(2) 500- 3/0	400	(2) 500- 3/0
		230	760	(2) 500 - #4	350	(2) 500- 3/0	400	(2) 500- 3/0
		460	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	110	(1) 3/0- #3	125	(1) 3/0- #3
125	2	208	760	(2) 500 - #4	400	(2) 500- 3/0	400	(2) 500- 3/0
		230	760	(2) 500 - #4	400	(2) 500- 3/0	400	(2) 500- 3/0
		460	380	(1) 500 - #4	200	(1) 350 - #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
130	1	208	760	(2) 500 - #4	400	(2) 500- 3/0	400	(2) 500- 3/0
		230	760	(2) 500 - #4	400	(2) 500- 3/0	400	(2) 500- 3/0
		460	380	(1) 500 - #4	200	(1) 350 - #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
130	2	208	760	(2) 500 - #4	400	(2) 500- 3/0	400	(2) 500- 3/0
		230	760	(2) 500 - #4	400	(2) 500- 3/0	400	(2) 500- 3/0
		460	380	(1) 500 - #4	200	(1) 350 - #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
140	1	208	760	(2) 500 - #4	400	(2) 500- 3/0	400	(2) 500- 3/0
		230	760	(2) 500 - #4	400	(2) 500- 3/0	400	(2) 500- 3/0
		460	380	(1) 500 - #4	200	(1) 350 - #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
140	2	208	760	(2) 500 - #4	400	(2) 500- 3/0	400	(2) 500- 3/0
		230	760	(2) 500 - #4	400	(2) 500- 3/0	400	(2) 500- 3/0
		460	380	(1) 500 - #4	200	(1) 350 - #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	125	(1) 3/0- #3	250	(1) 350 - #4
160	1	208	760	(2) 500 - #4	400	(2) 500- 3/0	400	(2) 500- 3/0
		230	760	(2) 500 - #4	500	(2) 500- 3/0	600	(2) 500- 3/0
		460	380	(1) 500 - #4	200	(1) 350 - #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	150	(1) 3/0- #4	250	(1) 350 - #4
160	2	208	760	(2) 500 - #4	500	(2) 500- 3/0	600	(2) 500- 3/0
		230	760	(2) 500 - #4	500	(2) 500- 3/0	600	(2) 500- 3/0
		460	380	(1) 500 - #4	250	(1) 350 - #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	200	(1) 350 - #4	250	(1) 350 - #4
180	1	208	760	(2) 500 - #4	500	(2) 500- 3/0	600	(2) 500- 3/0
		230	760	(2) 500 - #4	500	(2) 500- 3/0	600	(2) 500- 3/0
		460	380	(1) 500 - #4	250	(1) 350 - #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	200	(1) 350 - #4	250	(1) 350 - #4
180	2	208	760	(2) 500 - #4	500	(2) 500- 3/0	600	(2) 500- 3/0
		230	760	(2) 500 - #4	500	(2) 500- 3/0	600	(2) 500- 3/0
		460	380	(1) 500 - #4	250	(1) 350 - #4	250	(1) 350 - #4
		575	175	(1) 2/0 - #14	200	(1) 350 - #4	250	(1) 350 - #4

Figure 9, AGZ 030C – AGZ 180C, Typical Field Wiring



Physical Data

Packaged

Table 28, AGZ 030CH through 040CH, R-410A

PHYSICAL DATA	AGZ MODEL NUMBER					
	030C		035C		040C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI (1), Tons (kW)	31.5 (110.7)		34.1 (119.9)		37.1 (130.4)	
Number Of Refrigerant Circuits	2		2		2	
Unit Operating Charge, R-410A, Lbs.	30	30	32	32	40	40
Unit Operating Charge, R-410A, (kg)	13.6	13.6	14.5	14.5	18.1	18.1
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)	3195 (1449)		3205 (1454)		3285 (1490)	
3285 (1490)Unit Shipping Weight, Lb (kg)	3180 (1442)		3185 (1445)		3265 (1481)	
Add'l Weight If Copper Finned Coils, Lb (kg)	284 (129)		288 (130)		288 (130)	
COMPRESSORS						
Type	Tandem Scrolls		Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	8.5	8.5	8.5	10.0	10.0	10.0
Number Of Compressors per Circuit	2	2	2	2	2	2
Oil Charge Per Compressor, Oz.	110	110	110	110	110	110
Oil Charge Per Compressor, (g)	3119	3119	3119	3119	3119	3119
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT						
Staging, 4 Stages, Circuit #1 in Lead	0-25-50-75-100		23-50-73-100		0-25-50-75-100	
Staging, 4 Stages, Circuit #2 in Lead	0-25-50-75-100		27-50-73-100		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	44.1	44.1
Coil Face Area, (M^2)	2.4	2.4	2.4	2.4	4.1	4.1
Finned Height x Finned Length, (In.)	50x75.6	50x75.6	50x75.6	50x75.6	42x75.6	42x75.6
Finned Height x Finned Length, (mm)	1270 x 1920	1270 x 1920	1270 x 1920	1270 x 1920	1067 x 1920	1067 x 1920
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3	16 x 2	16 x 2
Pumpdown Capacity, 90% Full Lbs. (kg)	40 (18)	40 (18)	40 (18)	40 (18)	47 (21)	47 (21)
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) (Note 2)	4 – 1.5		4 – 1.5		4 – 1.5	
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 (l/sec)	24,316 (11,478)		39,600 (18,692)		39,600 (18,692)	
EVAPORATOR - BRAZED PLATE-TO-PLATE						
Number of Evaporators	1		1		1	
Number of Refrigerant Circuits	2		2		2	
Water Volume, Gallons, (L)	1.9 (7.14)		2.2 (8,3)		2.4 (9.1)	
Maximum Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)	
Max. Refrig. Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Conn. In. (mm)	2.5 (65)		2.5 (65)		2.5 (65)	
Drain - NPT int, In. (mm)	Field Piping		Field Piping		Field Piping	
Vent - NPT int, In. (mm)	Field Piping		Field Piping		Field Piping	

NOTES:
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60, HP = 2.0
3. Water connection shown is nominal pipe size.

Table 29, AGZ 045CH through 060CH, R-410A

PHYSICAL DATA	AGZ MODEL NUMBER							
	045C		050C		055C		060C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI Conditions (1), Tons (kW)	42.1 (148.0)		47.6 (167.4)		51.4 (180.7)		55.1 (193.7)	
Number Of Refrigerant Circuits	2		2		2		2	
Unit Operating Charge, R-410A, (lbs.)	47	47	50	50	52	52	54	54
Unit Operating Charge, R-410A, (kg)	21	221	23	23	24	24	25	25
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.	
Cabinet Dimensions, LxWxH, (mm)	2398 x 2235 x 2550		2398 x 2235 x 2550		2398 x 2235 x 2550		2398 x 2235 x 2550	
Unit Operating Weight, Lbs. (kg)	3445 (1563)		3525 (1599)		3555 (1613)		3760 (1706)	
Unit Shipping Weight, Lbs. (kg)	3420 (1551)		3495 (1585)		3525 (1599)		3710 (1683)	
Add'l Weight If Copper Finned Coils, lbs. (kg)	476 (216)		476 (216)		476 (216)		568 (258)	
COMPRESSORS								
Type	Tandem Scrolls		Tandem Scrolls		Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	11.5	11.5	13.0	13.0	13.0	15.0	15.0	15
Number Of Compressors per Circuit	2	2	2	2	2	2	2	2
Oil Charge Per Compressor, (oz.)	110	110	110	110	110	110	110	110
Oil Charge Per Compressor, (g)	3119	3119	3119	3119	3119	3119	3119	3119
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT								
Staging, 4 Stages, Circuit #1 in Lead	0-25-50-75-100		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		0-25-50-75-100		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.)	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1
Coil Face Area , (sq. m)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Finned Height x Finned Length, (in.)	42x75.6	42x75.6	42x75.6	42x75.6	42x75.6	42x75.6	42x75.6	42x75.6
Finned Height x Finned Length, (mm)	1067 x 1920	1067 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 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3
Pumpdown Capacity, 90% Full Lbs. (kg)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)
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 – 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 (l/sec)	39,600 (18,692)		39,600 (18,692)		37,228 (17,572)		43,452 (20,510)	
EVAPORATOR - BRAZED PLATE-TO-PLATE								
Number of Evaporators	1		1		1		1	
Number of Refrigerant Circuits	2		2		2		2	
Water Volume, Gallons, (L)	2.9 (11.0)		3.4 (12.8)		3.7 (14.0)		5.8 (22.1)	
Maximum Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Maximum Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Connections, in. (mm)	2.5 (65)		2.5 (65)		2.5 (65)		3 (80)	
Drain - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping		Field Piping	
Vent - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping		Field Piping	

NOTES

1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60, HP = 2.0
3. Water connection shown is nominal pipe size.

Table 30, AGZ 065CH through 070CH, R-410A

PHYSICAL DATA	AGZ MODEL NUMBER			
	065C		070C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI Conditions (1), Tons (kW)	57.1 (200.8)		62.3 (219.1)	
Number Of Refrigerant Circuits	2		2	
Unit Operating Charge, R-410A, lbs.	58	58	60	60
Unit Operating Charge, R-410A, (kg)	26	26	27	27
Cabinet Dimensions, LxWxH, in.	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	
Unit Operating Weight, Lbs. (kg)	3795 (1721)		4205 (1907)	
(1907Unit Shipping Weight, Lbs. (kg)	3740 (1696)		4150 (1882)	
Add'l Weight If Copper Finned Coils, lbs. (kg)	568 (258)		568 (258)	
COMPRESSORS				
Type	Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	15	15	15/20	15/20
Number Of Compressors per Circuit	2	2	2	2
Oil Charge Per Compressor, oz.	110	110	110/158	110/158
Oil Charge Per Compressor, (g)	3119	3119	3119/ 4479	3119/ 4479
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT				
Staging, 4 Stages, Circuit #1 in Lead	0-25-50-75-100		0-25-50-75-100	
Staging, 4 Stages, Circuit #2 in Lead	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.	52.6	52.6	52.6	52.6
Coil Face Area , sq. m	4.9	4.9	4.9	4.9
Finned Height x Finned Length, in.	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
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3
Pumpdown Capacity, 90% Full Lbs. (kg)	81 (37)	81 (37)	81 (37)	81 (37)
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE				
Number Of Fans - Fan Diameter, in. (mm)	4 – 30 (762)		4 – 30 (762)	
Number Of Motors - HP (kW) (2)	4 – 2.0		4 – 2.0	
Fan And Motor RPM, 60Hz	1140		1140	
60 Hz Fan Tip Speed, FPM (m/sec)	8950 (4224)		8950 (4224)	
60 Hz Total Unit Airflow, CFM (l/sec)	43,452 (20,510)		43,452 (20,510)	
EVAPORATOR - BRAZED PLATE-TO-PLATE				
Number of Evaporators	1		1	
Number of Refrigerant Circuits	2		2	
Water Volume, Gallons, (L)	6.4 (24.3)		6.4 (24.3)	
Maximum Water Pressure, psig (kPa)	653 (4502)		653 (4502)	
Maximum Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Connections, in. (mm)	3 (80)		3 (80)	
Drain - NPT int, in. (mm)	Field Piping		Field Piping	
Vent - NPT int, in. (mm)	Field Piping		Field Piping	

NOTES

1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60 for AGZ 060, HP = 2.0
3. Water connection shown is nominal pipe size.

Table 31, AGZ 075CH through 100CH, R-410A

PHYSICAL DATA	AGZ MODEL NUMBER							
	075C		080C		090C		100C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI Conditions (1), Tons (kW)	71.6 (251.7)		79.5 (279.5)		86.3 (303.4)		97.8 (343.9)	
Number Of Refrigerant Circuits	2		2		2		2	
Unit Operating Charge, R-410A, lbs.	80	80	80	80	86	86	88	88
Unit Operating Charge, R-410A, (kg)	36	36	36	36	39	39	40	40
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		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		3426 x 2235 x 2550	
Unit Operating Weight, Lbs. (kg)	5510 (2499)		5600 (2540)		5710 (2590)		5815 (2638)	
Unit Shipping Weight, Lbs. (kg)	5460 (2477)		5545 (2515)		5645 (2561)		5750 (2608)	
Add'l Weight If Copper Finned Coils, lbs. (kg)	870 (395)		870 (395)		870 (395)		870 (395)	
COMPRESSORS								
Type	Tandem Scrolls		Tandem Scrolls		Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	20	20	20	25	25	25	25/30	25/30
Number Of Compressors per Circuit	2	2	2	2	2	2	2	2
Oil Charge Per Compressor, oz.	158	158	158	230	230	230	230/213	230/213
Oil Charge Per Compressor, (g)	4479	4479	4479	6520	6520	6520	6520/ 6038	6520/ 6038
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		0-22-50-72-100	
Staging, 4 Stages, Circuit #2 in Lead	0-25-50-75-100		0-28-50-78-100		0-25-50-75-100		0-22-50-72-100	
CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING								
Coil Face Area, sq. ft.	66.2	66.2	66.2	66.2	78.8	78.8	78.8	78.8
Coil Face Area, (m^2)	6.1	6.1	6.1	6.1	7.3	7.3	7.3	7.3
Finned Height x Finned Length, in.	42 x113.4	42 x113.4	42 x113.4	42 x113.4	50 x113.4	50 x113.4	50 x113.4	50 x113.4
Finned Height x Finned Length, (mm)	1069 x 2880	1069 x 2880	1069 x 2880	1069 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	16 x 3	16 x 3
Pumpdown Capacity, 90% Full Lbs. (kg)	111 (50)	111 (50)	111 (50)	111 (50)	130 (59)	130 (59)	130 (59)	130 (59)
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE								
Number Of Fans - Fan Diameter, in. (mm)	6 – 30 (762)		6 – 30 (762)		6 – 30 (762)		6 – 30 (762)	
Number Of Motors - HP (kW)	6 – 2.0		6 – 2.0		6 – 2.0		6 – 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 (l/sec)	65,178 (30,765)		65,178 (30,765)		65,178 (30,765)		65,178 (30,765)	
EVAPORATOR – BRAZED PLATE-TO-PLATE								
Number of Evaporators	1		1		1		1,	
Number of Refrigerant Circuits	2		2		2		2	
Water Volume, Gallons, (L)	6.4 (24.2)		6.6 (24.9)		7.5 (28.4)		8.0 (30.2)	
Max. Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Max. Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Water Inlet/Outlet Victaulic Conn. in. (mm)	3 (80)		3 (80)		3 (80)		3 (80)	
Drain - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping		Field Piping	
Vent - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping		Field Piping	

NOTE:
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.

Table 32, AGZ 110CH through 130CH, R-410A

PHYSICAL DATA	AGZ MODEL NUMBER					
	110C		125C		130C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI Conditions (1), Tons (kW)	104.2 (366)		114.3 (402)		124.7 (438)	
Number Of Refrigerant Circuits	2		2		2	
Unit Operating Charge, R-410A, lbs.	102	102	115	115	115	115
Unit Operating Charge, R-410A, (kg)	46	46	52	52	52	52
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	
Cabinet Dimensions, LxWxH, (mm)	4397 x 2235 x 2550		4397 x 2235 x 2550		4397 x 2235 x 2550	
Unit Operating Weight, Lbs. (kg)	7270 (3298)		7500 (3402)		7665 (3477)	
Unit Shipping Weight, Lbs. (kg)	7200 (3266)		7420 (3366)		7570 (3434)	
Add'l Weight If Copper Finned Coils, lbs. (kg)	1155 (524)		1155 (524)		1155 (524)	
COMPRESSORS						
Type	Trio Scrolls		Trio Scrolls		Trio Scrolls	
Nominal tonnage of each Compressor	20.0	20.0	20.0	25.0	25.0	25.0
Number Of Compressors per Circuit	3	3	3	3	3	3
Oil Charge Per Compressor, oz.	158	158	158	230	230	230
Oil Charge Per Compressor, (g)	4479	4479	4479	6520	520	6520
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT						
Staging, 6 Stages, Circuit #1 in Lead	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	0-17-33-50-67-83-100		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.	88.4	88.4	105.3	105.3	105.3	105.3
Coil Face Area, (m^2)	8.2	8.2	9.8	9.8	9.8	9.8
Finned Height x Finned Length, in.	42 x151.6	42 x151.6	50 x151.6	50 x151.6	50 x151.6	50 x151.6
Finned Height x Finned Length, (mm)	1069 x 3851	1069 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
Pumpdown Capacity, 90% Full Lbs. (kg)	142/64	142/64	166/75	166/75	166/75	166/75
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE						
Number Of Fans - Fan Diameter, in. (mm)	8 – 30 (762)		8 – 30 (762)		8 – 30 (762)	
Number Of Motors - HP (kW)	8 – 2.0		8 – 2.0		8 – 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 (l/sec)	86,904 (41,020)		86,904 (41,020)		86,904 (41,020)	
EVAPORATOR – BRAZED PLATE-TO-PLATE						
Number of Evaporators	1		1		1	
Number of Refrigerant Circuits	2		2		2	
Water Volume, Gallons, (L)	8.5 (32.1)		9.6 (36.3)		10.5 (39.7)	
Max. Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)	
Max. Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Conn, in. (mm)	3 (80)		3 (80)		3 (80)	
Drain - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping	
Vent - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping	

NOTE:

1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.

Table 33, AGZ 140CH through 180CH, R-410A

PHYSICAL DATA	AGZ MODEL NUMBER					
	140C		160C		180C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI (1), Tons (kW)	133.7 (470)		151.5 (533)		169.3 (595)	
Number Of Refrigerant Circuits	2		2		2	
Unit Operating Charge, R-410A, Lbs.	135	135	140	140	140	140
Unit Operating Charge, R-410A, (kg)	61	61	64	64	64	64
Cabinet Dimensions, LxWxH, (In.)	218.6 x 88.0 x 100.4		218.6 x 88.0 x 100.4		218.6 x 88.0 x 100.4	
Cabinet Dimensions, LxWxH, (mm)	5552 x 2235 x 2545		5552 x 2235 x 2545		5552 x 2235 x 2545	
Unit Operating Weight, Lb (kg)	9530 (4323)		9680 (4391)		9830 (4459)	
Unit Shipping Weight, Lb (kg)	9155 (4153)		9320 (4228)		9470 (4296)	
Add'l Weight If Copper Finned Coils, Lb (kg)	1596 (724)		1596 (724)		1596 (724)	
COMPRESSORS						
Type	Triple Scrolls		Triple Scrolls		Triple Scrolls	
Nominal tonnage of each Compressor	25	25	25	30	30	30
Number Of Compressors per Circuit	3	3	3	3	3	3
Oil Charge Per Compressor, (oz.)	230	230	230	213	213	213
Oil Charge Per Compressor, (g)	6520	6520	6520	6038	6038	6038
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT						
Staging, 6 Stages, Circuit #1 in Lead	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	0-17-33-50-67-83-100		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.)	131.8	131.8	131.8	131.8	131.8	131.8
Coil Face Area, (M^2)	12.2	12.2	12.2	12.2	12.2	12.2
Finned Height x Finned Length, (In.)	50 x 190	50 x 190	50 x 190	50 x 190	50 x 190	50 x 190
Finned Height x Finned Length, (mm)	1270 x 4821	1270 x 4821	1270 x 4821	1270 x 4821	1270 x 4821	1270 x 4821
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3	16 x 2	16 x 2
Pumpdown Capacity, 90% Full Lbs. (kg)	202 (92)	202 (92)	202 (92)	202 (92)	202 (92)	202 (92)
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE						
Number Of Fans - Fan Diameter, In. (mm)	10 – 30 (762)		10 – 30 (762)		10 – 30 (762)	
Number Of Motors - HP (kW)	10 – 1.5		10 – 1.5		10 – 1.5	
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 (l/sec)	108,630 (51,268)		108,630 (51,268)		108,630 (51,268)	
EVAPORATOR - SHELL-AND-TUBE						
Number of Evaporators	1		1		1	
Number of Refrigerant Circuits	2		2		2	
Water Volume, Gallons, (L)	43 (164)		43 (164		43 (164	
Maximum Water Pressure, psig (kPa)	152 (1048)		152 (1048)		152 (1048)	
Max. Refrig. Working Pressure, psig (kPa)	450 (3103)		450 (3103)		450 (3103)	
Water Inlet / Outlet Victaulic Conn. In. (mm)	8.0 (200)		8.0 (200)		8.0 (200)	
Drain - NPT int, In.	½-in. NPTF		½-in. NPTF		½-in. NPTF	
Vent - NPT int, In.	½-in. NPTF		½-in. NPTF		½-in. NPTF	

NOTE:
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.

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Table 34, AGZ 030CB through 040CB, R-410A

PHYSICAL DATA	AGZ MODEL NUMBER					
	030C		035C		040C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI (1), Tons (kW)	31.5 (110.7)		34.1 (119.9)		37.1 (130.4)	
Number Of Refrigerant Circuits	2		2		2	
Unit Operating Charge, R-410A, Lbs.	30	30	32	32	40	40
Unit Operating Charge, R-410A, (kg)	13.6	13.6	14.5	14.5	18.1	18.1
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)	3130 (1420)		3130 (1420)		3195 (1449)	
Unit Shipping Weight, Lb (kg)	3070 (1393)		3070 (1393)		3115 (1413)	
Add'l Weight If Copper Finned Coils, Lb (kg)	284 (129)		288 (130)		288 (130)	
COMPRESSORS						
Type	Tandem Scrolls		Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	8.5	8.5	8.5	10.0	10.0	10.0
Number Of Compressors per Circuit	2	2	2	2	2	2
Oil Charge Per Compressor, Oz.	110	110	110	110	110	110
Oil Charge Per Compressor, (g)	3119	3119	3119	3119	3119	3119
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT						
Staging, 4 Stages, Circuit #1 in Lead	0-25-50-75-100		23-50-73-100		0-25-50-75-100	
Staging, 4 Stages, Circuit #2 in Lead	0-25-50-75-100		27-50-73-100		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	44.1	44.1
Coil Face Area, (M^2)	2.4	2.4	2.4	2.4	4.1	4.1
Finned Height x Finned Length, In.	50x75.6	50x75.6	50x75.6	50x75.6	42x75.6	42x75.6
Finned Height x Finned Length, (mm)	1270 x 1920	1270 x 1920	1270 x 1920	1270 x 1920	1067 x 1920	1067 x 1920
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3	16 x 2	16 x 2
Pumpdown Capacity, 90% Full Lbs. (kg)	40 (18)	40 (18)	40 (18)	40 (18)	47 (21)	47 (21)
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) (Note 2)	4 – 1.5		4 – 1.5		4 – 1.5	
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 (l/sec)	24,316 (11,478)		39,600 (18,692)		39,600 (18,692)	
REMOTE EVAPORATOR - BRAZED PLATE-TO-PLATE						
Number of Evaporators	1		1		1	
Number of Refrigerant Circuits	2		2		2	
Evaporator Model	ACH130-90DQ		ACH130-102DQ		ACH130-118DQ	
Dry Weight lbs (kg)	99 (45)		110 (50)		126 (57)	
Water Volume, Gallons, (L)	1.9 (7.14)		2.2 (8,3)		2.4 (9.1)	
Maximum Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)	
Max. Refrig. Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Conn. In. (mm)	2.5 (65)		2.5 (65)		2.5 (65)	
Drain - NPT int, In. (mm)	Field Piping		Field Piping		Field Piping	
Vent - NPT int, In. (mm)	Field Piping		Field Piping		Field Piping	

NOTES:
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60, HP = 2.0
3. Water connection shown is nominal pipe size.
4. Units shipped with a holding charge. Operating charge quantity shown must have field piping charge added.

Table 35, AGZ 045CB through 060CB, Remote Evaporator

PHYSICAL DATA	AGZ MODEL NUMBER							
	045C		050C		055C		060C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI Conditions (1), Tons (kW)	42.1 (148.0)		47.6 (167.4)		51.4 (180.7)		55.1 (193.7)	
Number Of Refrigerant Circuits	2		2		2		2	
Unit Operating Charge, R-410A, lbs.	47	47	50	50	52	52	54	54
Unit Operating Charge, R-410A, (kg)	21	221	23	23	24	24	25	25
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.	
Cabinet Dimensions, LxWxH, (mm)	2398 x 2235 x 2550		2398 x 2235 x 2550		2398 x 2235 x 2550		2398 x 2235 x 2550	
Unit Operating Weight, Lbs. (kg)	3360 (1524)		3380 (1533)		3410 (1547)		3430 (1556)	
Unit Shipping Weight, Lbs. (kg)	3260 (1479)		3280 (1488)		3300 (1497)		3320 (1506	
Add'l Weight If Copper Finned Coils, lbs. (kg)	476 (216)		476 (216)		476 (216)		568 (258)	
COMPRESSORS								
Type	Tandem Scrolls		Tandem Scrolls		Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	11.5	11.5	13.0	13.0	13.0	15.0	15.0	15
Number Of Compressors per Circuit	2	2	2	2	2	2	2	2
Oil Charge Per Compressor, (oz.)	110	110	110	110	110	110	110	110
Oil Charge Per Compressor, (g)	3119	3119	3119	3119	3119	3119	3119	3119
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT								
Staging, 4 Stages, Circuit #1 in Lead	0-25-50-75-100		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		0-25-50-75-100		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.)	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1
Coil Face Area , (sq. m)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Finned Height x Finned Length, (in.)	42x75.6	42x75.6	42x75.6	42x75.6	42x75.6	42x75.6	42x75.6	42x75.6
Finned Height x Finned Length, (mm)	1067 x 1920	1067 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 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3
Pumpdown Capacity, 90% Full Lbs. (kg)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)
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 – 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 (l/sec)	39,600 (18,692)		39,600 (18,692)		37,228 (17,572		43,452 (20,510)	
REMOTE EVAPORATOR - BRAZED PLATE-TO-PLATE								
Number of Evaporators	1		1		1		1	
Number of Refrigerant Circuits	2		2		2		2	
Evaporator Model	ACH130-138DQ		ACH130-158DQ		ACH130-178DQ		ACH250-110DQ	
Dry Weight lbs (kg)	146 (66)		165 (75)		183 (83)		229 (104)	
Water Volume, Gallons, (L)	2.9 (11.0)		3.4 (12.8)		3.7 (14.0)		5.8 (22.1)	
Maximum Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Maximum Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Connections, in. (mm)	2.5 (65)		2.5 (65)		2.5 (65)		3 (80)	
Drain - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping		Field Piping	
Vent - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping		Field Piping	

NOTES

1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60, HP = 2.0
3. Water connection shown is nominal pipe size.
4. Units shipped with a holding charge. Operating charge quantity shown must have field piping charge added.

Table 36, AGZ 065CB through 070CB, Remote Evaporator

PHYSICAL DATA	AGZ MODEL NUMBER			
	065C		070C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI Conditions (1), Tons (kW)	57.1 (200.8)		62.3 (219.1)	
Number Of Refrigerant Circuits	2		2	
Unit Operating Charge, R-410A, (lbs.)	58	58	60	60
Unit Operating Charge, R-410A, (kg)	26	26	27	27
Cabinet Dimensions, LxWxH, (in.)	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	
Unit Operating Weight, Lbs. (kg)	3470 (1574)		3700 (1678)	
Unit Shipping Weight, Lbs. (kg)	3350 (1520)		3580 (1624)	
Add'l Weight If Copper Finned Coils, lbs. (kg)	568 (258)		568 (258)	
COMPRESSORS				
Type	Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	15	15	15/20	15/20
Number Of Compressors per Circuit	2	2	2	2
Oil Charge Per Compressor, (oz.)	110	110	110/158	110/158
Oil Charge Per Compressor, (g)	3119	3119	3119/ 4479	3119/ 4479
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT				
Staging, 4 Stages, Circuit #1 in Lead	0-25-50-75-100		0-25-50-75-100	
Staging, 4 Stages, Circuit #2 in Lead	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.	52.6	52.6	52.6	52.6
Coil Face Area , sq. m	4.9	4.9	4.9	4.9
Finned Height x Finned Length, in.	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
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3
Pumpdown Capacity, 90% Full Lbs. (kg)	81 (37)	81 (37)	81 (37)	81 (37)
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE				
Number Of Fans - Fan Diameter, in. (mm)	4 – 30 (762)		4 – 30 (762)	
Number Of Motors - HP (kW) (Note 2)	4 – 2.0		4 – 2.0	
Fan And Motor RPM, 60Hz	1140		1140	
60 Hz Fan Tip Speed, FPM (m/sec)	8950 (4224)		8950 (4224)	
60 Hz Total Unit Airflow, CFM (l/sec)	43,452 (20,510)		43,452 (20,510)	
REMOTE EVAPORATOR - BRAZED PLATE-TO-PLATE				
Number of Evaporators	1		1	
Number of Refrigerant Circuits	2		2	
Evaporator Model	ACH250-122DQ		ACH250122DQ	
Dry Weight lbs (kg)	251 (114)		251 (114)	
Water Volume, Gallons, (L)	6.4 (24.3)		6.4 (24.3)	
Maximum Water Pressure, psig (kPa)	653 (4502)		653 (4502)	
Maximum Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Connections, in. (mm)	3 (80)		3 (80)	
Drain - NPT int, in.	Field Piping		Field Piping	
Vent - NPT int, in.	Field Piping		Field Piping	

NOTES

1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60 for AGZ 060, HP = 2.0
3. Water connection shown is nominal pipe size.
4. Units shipped with a holding charge. Operating charge quantity shown must have field piping charge added.
5.

Table 37, AGZ 075CB through 100CB, Remote Evaporator

PHYSICAL DATA	AGZ MODEL NUMBER							
	075C		080C		090C		100C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI Conditions (1), Tons (kW)	71.6 (251.7)		79.5 (279.5)		86.3 (303.4)		97.8 (343.9)	
Number Of Refrigerant Circuits	2		2		2		2	
Unit Operating Charge, R-410A, lbs.	80	80	80	80	86	86	88	88
Unit Operating Charge, R-410A, (kg)	36	36	36	36	39	39	40	40
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		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		3426 x 2235 x 2550	
Unit Operating Weight, Lbs. (kg)	5225 (2370)		5320 (2413)		5390 (2445)		5480 (2486)	
Unit Shipping Weight, Lbs. (kg)	5065 (2297)		5160 (2341)		5220 (2368)		5300 (2404)	
Add'l Weight If Copper Finned Coils, lbs. (kg)	870 (395)		870 (395)		870 (395)		870 (395)	
COMPRESSORS								
Type	Tandem Scrolls		Tandem Scrolls		Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	20	20	20	25	25	25	25/30	25/30
Number Of Compressors per Circuit	2	2	2	2	2	2	2	2
Oil Charge Per Compressor, oz.	158	158	158	230	230	230	230/213	230/213
Oil Charge Per Compressor, (g)	4479	4479	4479	6520	6520	6520	6520/ 6038	6520/ 6038
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		0-22-50-72-100	
Staging, 4 Stages, Circuit #2 in Lead	0-25-50-75-100		0-28-50-78-100		0-25-50-75-100		0-22-50-72-100	
CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING								
Coil Face Area, sq. ft.	66.2	66.2	66.2	66.2	78.8	78.8	78.8	78.8
Coil Face Area, (m^2)	6.1	6.1	6.1	6.1	7.3	7.3	7.3	7.3
Finned Height x Finned Length, in.	42 x113.4	42 x113.4	42 x113.4	42 x113.4	50 x113.4	50 x113.4	50 x113.4	50 x113.4
Finned Height x Finned Length, (mm)	1069 x 2880	1069 x 2880	1069 x 2880	1069 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	16 x 3	16 x 3
Pumpdown Capacity, 90% Full Lbs. (kg)	111 (50)	111 (50)	111 (50)	111 (50)	130 (59)	130 (59)	130 (59)	130 (59)
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE								
Number Of Fans - Fan Diameter, in. (mm)	6 – 30 (762)		6 – 30 (762)		6 – 30 (762)		6 – 30 (762)	
Number Of Motors - HP (kW)	6 – 2.0		6 – 2.0		6 – 2.0		6 – 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 (l/sec)	65,178 (30,765)		65,178 (30,765)		65,178 (30,765)		65,178 (30,765)	
REMOTE EVAPORATOR – BRAZED PLATE-TO-PLATE								
Number of Evaporators	1		1		1		1,	
Number of Refrigerant Circuits	2		2		2		2	
Evaporator Model	ACH350-118DQ		ACH350-126DQ		ACH350-150DQ		ACH350-162DQ	
Dry Weight lbs (kg)	243 (110)		258 (117)		287 (130)		324 (147)	
Water Volume, Gallons, (L)	6.4 (24.2)		6.6 (24.9)		7.5 (28.4)		8.0 (30.2)	
Max. Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Max. Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Water Inlet/Outlet Victaulic Conn. in. (mm)	3 (80)		3 (80)		3 (80)		3 (80)	
Drain - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping		Field Piping	
Vent - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping		Field Piping	

NOTE:
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.
3. Units shipped with a holding charge. Operating charge quantity shown must have field piping charge added.

Table 38, AGZ 110CB through 130CB, Remote Evaporator

PHYSICAL DATA	AGZ MODEL NUMBER					
	110C		125C		130C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI Conditions (1), Tons (kW)	104.2 (366)		114.3 (402)		124.7 (438)	
Number Of Refrigerant Circuits	2		2		2	
Unit Operating Charge, R-410A, lbs.	102	102	115	115	115	115
Unit Operating Charge, R-410A, (kg)	46	46	52	52	52	52
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	
Cabinet Dimensions, LxWxH, (mm)	4397 x 2235 x 2550		4397 x 2235 x 2550		4397 x 2235 x 2550	
Unit Operating Weight, Lbs. (kg)	6035 (2737)		6215 (2819)		6315 (2864)	
Unit Shipping Weight, Lbs. (kg)	5830 (2644)		5995 (2719)		6085 (2760)	
Add'l Weight If Copper Finned Coils, lbs. (kg)	1155 (524)		1155 (524)		1155 (524)	
COMPRESSORS						
Type	Trio Scrolls		Trio Scrolls		Trio Scrolls	
Nominal tonnage of each Compressor	20.0	20.0	20.0	25.0	25.0	25.0
Number Of Compressors per Circuit	3	3	3	3	3	3
Oil Charge Per Compressor, oz.	158	158	158	230	230	230
Oil Charge Per Compressor, (g)	4479	4479	4479	6520	520	6520
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT						
Staging, 6 Stages, Circuit #1 in Lead	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	0-17-33-50-67-83-100		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.	88.4	88.4	105.3	105.3	105.3	105.3
Coil Face Area, (m^2)	8.2	8.2	9.8	9.8	9.8	9.8
Finned Height x Finned Length, in.	42 x151.6	42 x151.6	50 x151.6	50 x151.6	50 x151.6	50 x151.6
Finned Height x Finned Length, (mm)	1069 x 3851	1069 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
Pumpdown Capacity, 90% Full Lbs. (kg)	142/64	142/64	166/75	166/75	166/75	166/75
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE						
Number Of Fans - Fan Diameter, in. (mm)	8 – 30 (762)		8 – 30 (762)		8 – 30 (762)	
Number Of Motors - HP (kW)	8 – 2.0		8 – 2.0		8 – 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 (l/sec)	86,904 (41,020)		86,904 (41,020)		86,904 (41,020)	
REMOTE EVAPORATOR - BRAZED PLATE-TO-PLATE						
Number of Evaporators	1		1		1	
Number of Refrigerant Circuits	2		2		2	
Evaporator Model	ACH350-162DQ		ACH350-182DQ		ACH350-210DQ	
Dry Weight lbs (kg)	324 (147)		359 (163)		410 (186)	
Water Volume, Gallons, (L)	8.5 (32.1)		9.6 (36.3)		10.5 (39.7)	
Max. Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)	
Max. Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Conn, in. (mm)	3 (80)		3 (80)		3 (80)	
Drain - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping	
Vent - NPT int, in. (mm)	Field Piping		Field Piping		Field Piping	

NOTE:
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.
3. Units shipped with a holding charge. Operating charge quantity shown must have field piping charge added.

Table 39, AGZ 140CB through 180CB, Remote Evaporator

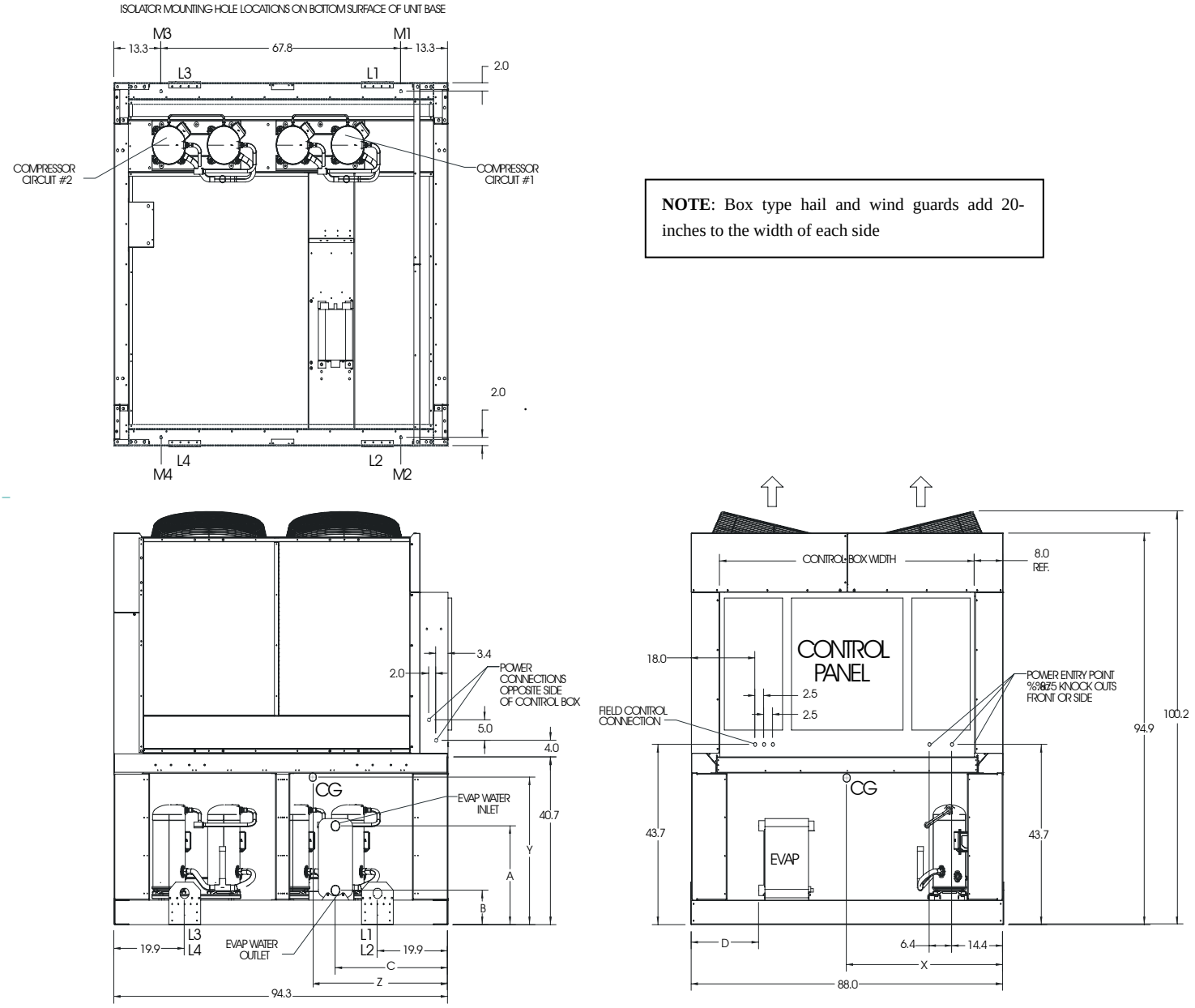
PHYSICAL DATA	AGZ MODEL NUMBER					
	140C		160C		180C	
BASIC DATA	Ckt.1	Ckt.2	Ckt.1	Ckt.2	Ckt.1	Ckt.2
Unit Capacity @ ARI (1), Tons (kW)	133.7 (470)		151.5 (533)		169.3 (595)	
Number Of Refrigerant Circuits	2		2		2	
Unit Operating Charge, R-410A, Lbs.	135	135	140	140	140	140
Unit Operating Charge, R-410A, (kg)	61	61	64	64	64	64
Cabinet Dimensions, LxWxH, In.	218.6 x 88.0 x 100.4		218.6 x 88.0 x 100.4		218.6 x 88.0 x 100.4	
Cabinet Dimensions, LxWxH, (mm)	5552 x 2235 x 2545		5552 x 2235 x 2545		5552 x 2235 x 2545	
Unit Operating Weight, Lb (kg)	8380 (3801)		8510 (3860)		8630 (3915)	
Unit Shipping Weight, Lb (kg)	8120 (3683)		8240 (3738)		8350 (3788)	
Add'l Weight If Copper Finned Coils, Lb (kg)	1596 (724)		1596 (724)		1596 (724)	
COMPRESSORS						
Type	Triple Scrolls		Triple Scrolls		Triple Scrolls	
Nominal tonnage of each Compressor	25	25	25	30	30	30
Number Of Compressors per Circuit	3	3	3	3	3	3
Oil Charge Per Compressor, Oz.	230	230	230	213	213	213
Oil Charge Per Compressor, (g)	6520	6520	6520	6038	6038	6038
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT						
Staging, 6 Stages, Circuit #1 in Lead	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	0-17-33-50-67-83-100		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.	131.8	131.8	131.8	131.8	131.8	131.8
Coil Face Area, (M^2)	12.2	12.2	12.2	12.2	12.2	12.2
Finned Height x Finned Length, In.	50 x 190	50 x 190	50 x 190	50 x 190	50 x 190	50 x 190
Finned Height x Finned Length, (mm)	1270 x 4821	1270 x 4821	1270 x 4821	1270 x 4821	1270 x 4821	1270 x 4821
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3	16 x 2	16 x 2
Pumpdown Capacity, 90% Full Lbs. (kg)	202 (92)	202 (92)	202 (92)	202 (92)	202 (92)	202 (92)
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE						
Number Of Fans - Fan Diameter, In. (mm)	10 – 30 (762)		10 – 30 (762)		10 – 30 (762)	
Number Of Motors - HP (kW) (2)	104 – 1.5		10 – 1.5		10 – 1.5	
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 (l/sec)	108,630 (51,268)		108,630 (51,268)		108,630 (51,268)	
REMOTE EVAPORATOR SHELL-AND-TUBE						
Number of Evaporators	1		1		1	
Number of Refrigerant Circuits	2		2		2	
Evaporator Model	EV32270099/9		EV32270099/9		EV32270099/9	
Dry Weight lbs (kg)	775 (352)		775 (352)		775 (352)	
Water Volume, Gallons, (L)	43 (164)		43 (164		43 (164	
Maximum Water Pressure, psig (kPa)	152 (1048)		152 (1048)		152 (1048)	
Max. Refrig. Working Pressure, psig (kPa)	450 (3103)		450 (3103)		450 (3103)	
Water Inlet / Outlet Victaulic Conn. In. (mm)	8.0 (200)		8.0 (200)		8.0 (200)	
Drain - NPT int, In.	½-in. NPTF		½-in. NPTF		½-in. NPTF	
Vent - NPT int, In.	½-in. NPTF		½-in. NPTF		½-in. NPTF	

NOTE:
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.
3. Units shipped with a holding charge. Operating charge quantity shown must have field piping charge added.

Dimensional Data

Packaged Units

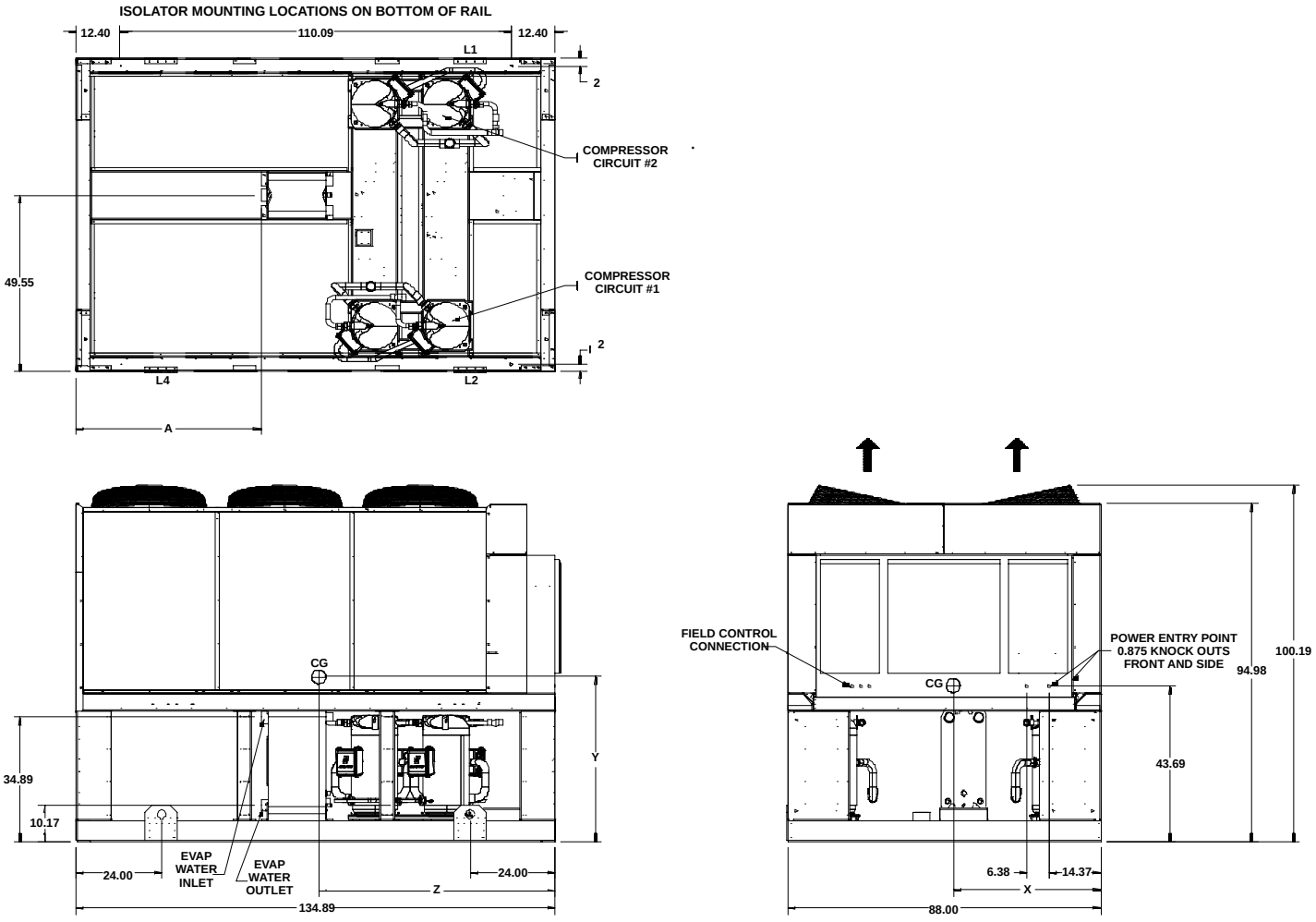
Figure 10, Dimensions, AGZ 030CH – 070CH, Packaged Chiller



NOTE: Box type hail and wind guards add 20-inches to the width of each side

UNIT MODEL	CG LOCATION (in.)			SHIP WEIGHT (lbs)	OPN. WEIGHT (lbs)	LIFTING WEIGHT BY CORNER (lbs)				VICTAULIC CONN. SIZE (in.)	EVAP DIMENSIONS (in.)			
	X	Y	Z			L1	L2	L3	L4		A	B	C	D
AGZ030C	37.8	42.9	42.3	3180	3195	1069	806	745	561	Ø2.5	24.0	8.3	33.8	23.2
AGZ035C	37.9	42.8	42.3	3185	3205	1070	810	743	562	Ø2.5	24.0	8.3	33.8	22.2
AGZ040C	38.1	43.3	42.5	3265	3285	1084	829	766	586	Ø2.5	24.0	8.3	33.8	20.8
AGZ045C	38.6	44.3	42.7	3420	3445	1116	871	805	628	Ø2.5	24.0	8.3	33.8	19.0
AGZ050C	38.7	44.0	42.6	3495	3525	1143	898	815	640	Ø2.5	24.0	8.3	33.8	17.3
AGZ055C	38.8	44.9	42.6	3525	3555	1150	908	820	647	Ø2.5	24.0	8.3	33.8	15.6
AGZ060C	39.1	45.8	42.4	3710	3760	1210	967	852	681	Ø3.0	33.5	8.8	32.9	19.3
AGZ065C	39.3	45.6	42.4	3740	3795	1216	980	855	689	Ø3.0	33.5	8.8	32.9	18.0
AGZ070C	36.7	39.3	44.2	4150	4205	1342	960	1078	771	Ø3.0	33.5	8.8	32.9	18.0

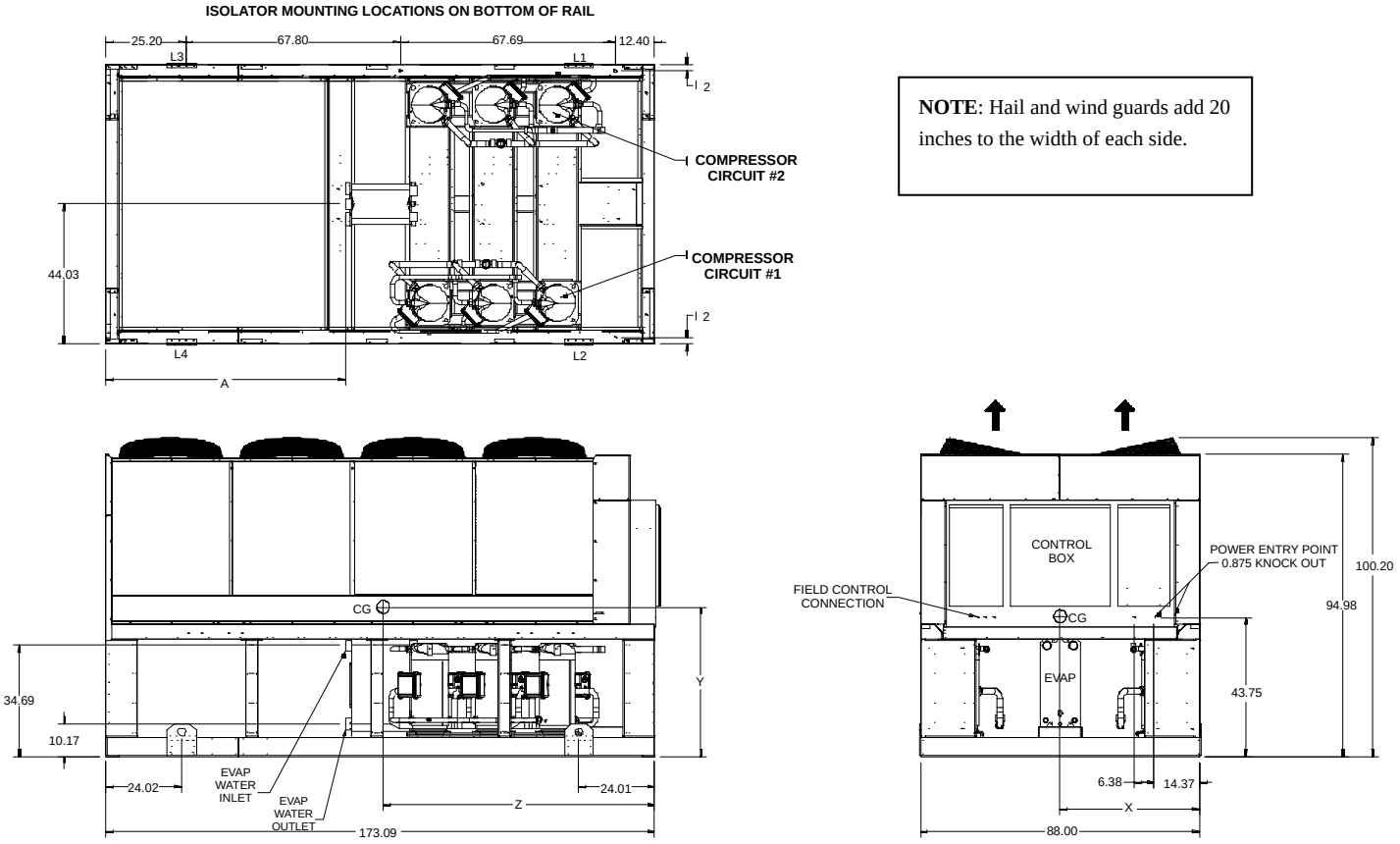
Figure 11, Dimensions, AGZ 075CH – 100CH Packaged Chiller



NOTE: Box type hail and wind guards add 20 inches to the width of each side

UNIT MODEL	CG LOCATION (in.)			SHIPPING WEIGHT (lbs)	OPERATING WEIGHT (lbs)	CORNER LIFTING WEIGHT (in.)				VICTAULIC CONN. SIZE (in.)	EVAP DIM. (in.)
	X	Y	Z			L1	L2	L3	L4		A
AGZ075C	43.6	43.5	54.8	5460	5510	1780	1748	975	958	Ø3.0	54.7
AGZ080C	44.0	45.3	52.9	5545	5600	1851	1851	922	921	Ø3.0	53.8
AGZ090C	43.6	46.8	54.6	5645	5710	1846	1810	1004	985	Ø3.0	52.0
AGZ100C	43.6	46.6	54.5	5750	5815	1885	1848	1019	999	Ø3.0	51.1

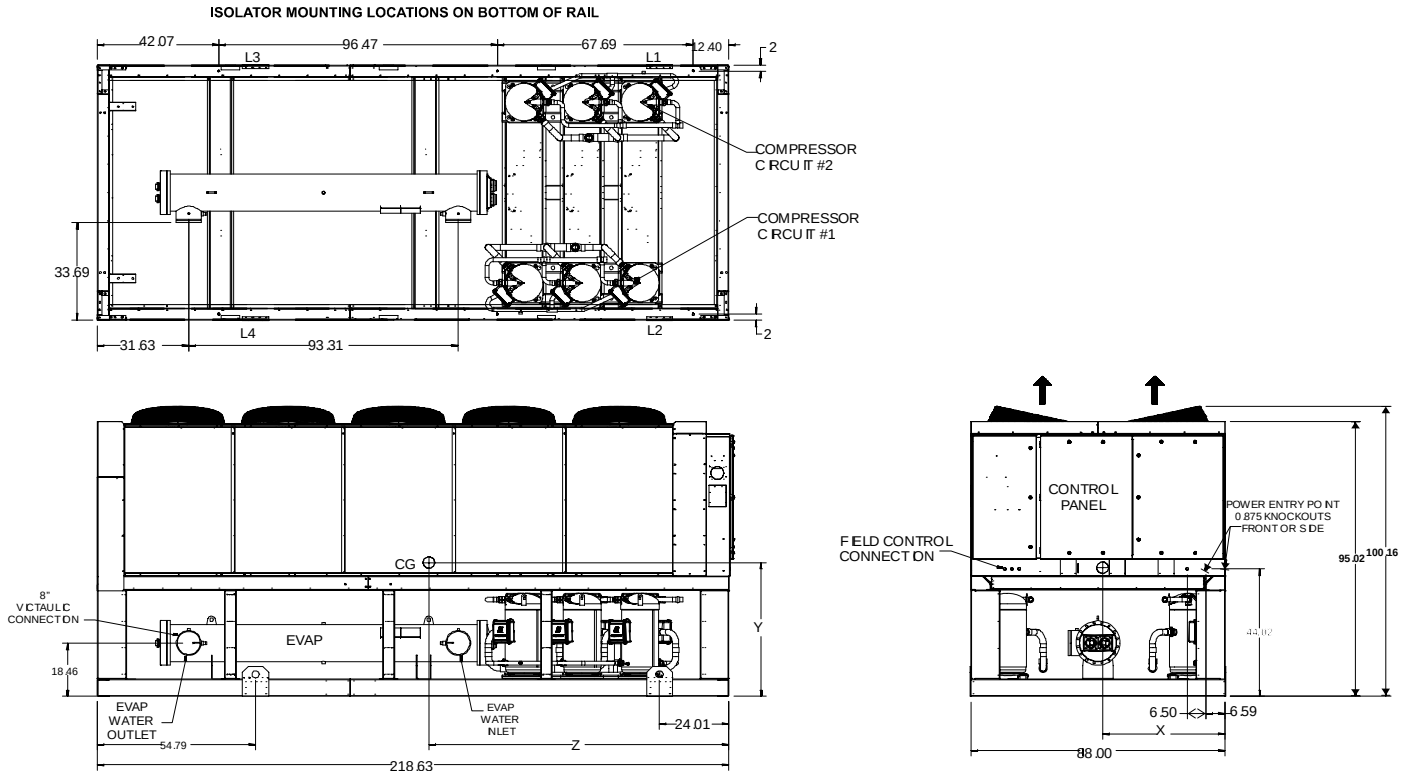
Figure 12, Dimensions, AGZ 110CH – 130CH, Packaged Chiller



NOTE: Hail and wind guards add 20 inches to the width of each side.

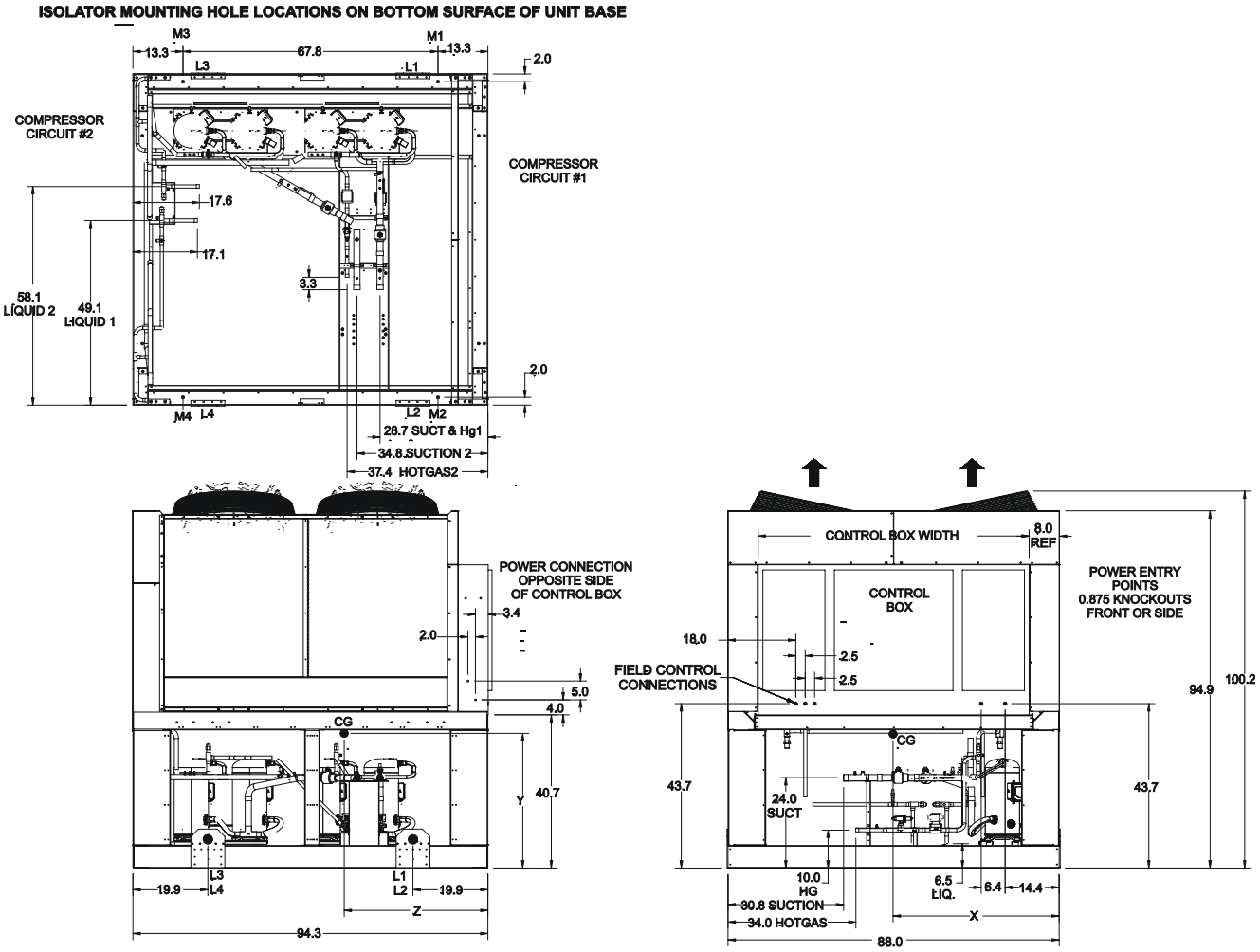
UNIT MODEL	CG LOCATION (in.)			SHIPPING WEIGHT (lbs)	OPERATING WEIGHT (lbs)	CORNER LIFTING WEIGHT (in.)				VICTAULIC CONN. SIZE (in.)	EVAP DIM (in.)
	X	Y	Z			L1	L2	L3	L4		A
AGZ110C	44.0	42.9	69.0	7200	7270	2305	2307	1294	1295	Ø3.0	75.5
AGZ125C	43.4	44.1	68.9	7420	7500	2411	2346	1350	1314	Ø3.0	73.3
AGZ130C	44.0	45.3	68.9	7570	7665	2426	2426	1359	1359	Ø3.0	70.2

Figure 13, Dimensions, AGZ 140CH – 180CH, Packaged Chiller



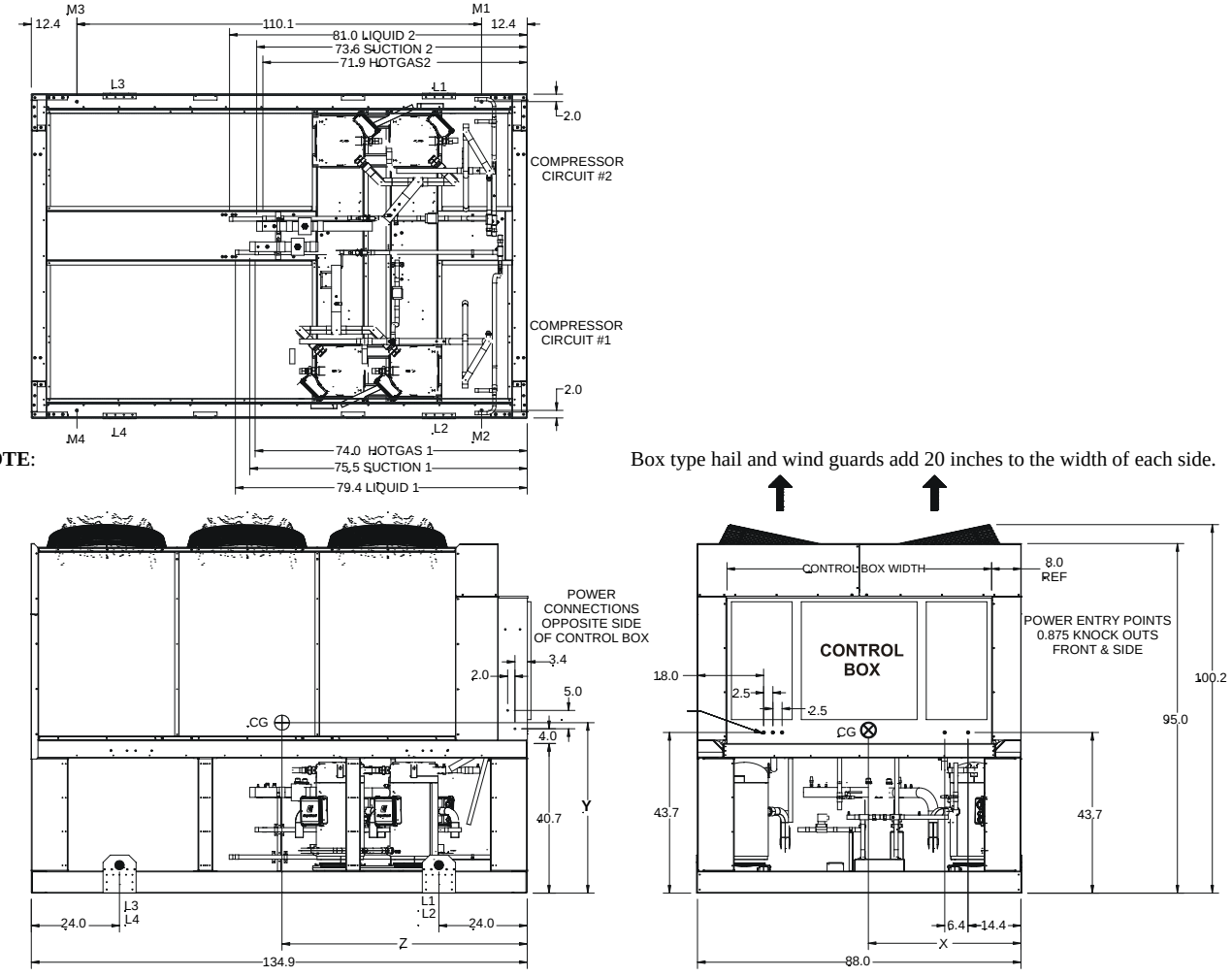
UNIT MODEL	CG LOCATION (in.)			SHIPPING WEIGHT (lbs)	OPERATING WEIGHT (lbs)	LIFTING WEIGHT BY CORNER (lbs)				VICTAULIC CONN. SIZE (in.)
	X	Y	Z			L1	L2	L3	L4	
AGZ140C	43.4	46.1	85.3	9155	9530	2608	2537	2033	1977	8
AGZ160C	43.0	42.8	84.6	9320	9680	2700	2578	2068	1974	8
AGZ180C	43.4	39.6	84.2	9470	9830	2734	2658	2068	2011	8

Figure 14, Dimensions, AGZ 030CB – 070CB, w/ Remote Evaporator



UNIT MODEL	CG LOCATION (IN)			SHIPPING WEIGHT (LBS)	OPERATING WEIGHT (LBS)	LIFTING WEIGHT BY CORNER (LBS)				REFRIG CONNECTIONS (IN.)		
	X	Y	Z			L1	L2	L3	L4	SUCT. O.D.	LIQ. O.D.	HGBP O.D.
AGZ030C	37.8	42.9	42.3	3180	3195	1069	806	745	561	1.625	0.875	0.875
AGZ035C	37.9	42.8	42.3	3185	3205	1070	810	743	562	1.625	0.875	0.875
AGZ040C	38.1	43.3	42.5	3265	3285	1084	829	766	586	1.625	0.875	0.875
AGZ045C	38.6	44.3	42.7	3420	3445	1116	871	805	628	1.625	0.875	0.875
AGZ050C	38.7	44.0	42.6	3495	3525	1143	898	815	640	1.625	0.875	0.875
AGZ055C	38.8	44.9	42.6	3525	3555	1150	908	820	647	1.625	0.875	0.875
AGZ060C	39.1	45.8	42.4	3710	3760	1210	967	852	681	1.625	0.875	0.875
AGZ065C	39.3	45.6	42.4	3740	3795	1216	980	855	689	1.625	0.875	0.875
AGZ070C	36.7	39.3	44.2	4150	4205	1342	960	1078	771	2.125	0.875	0.875

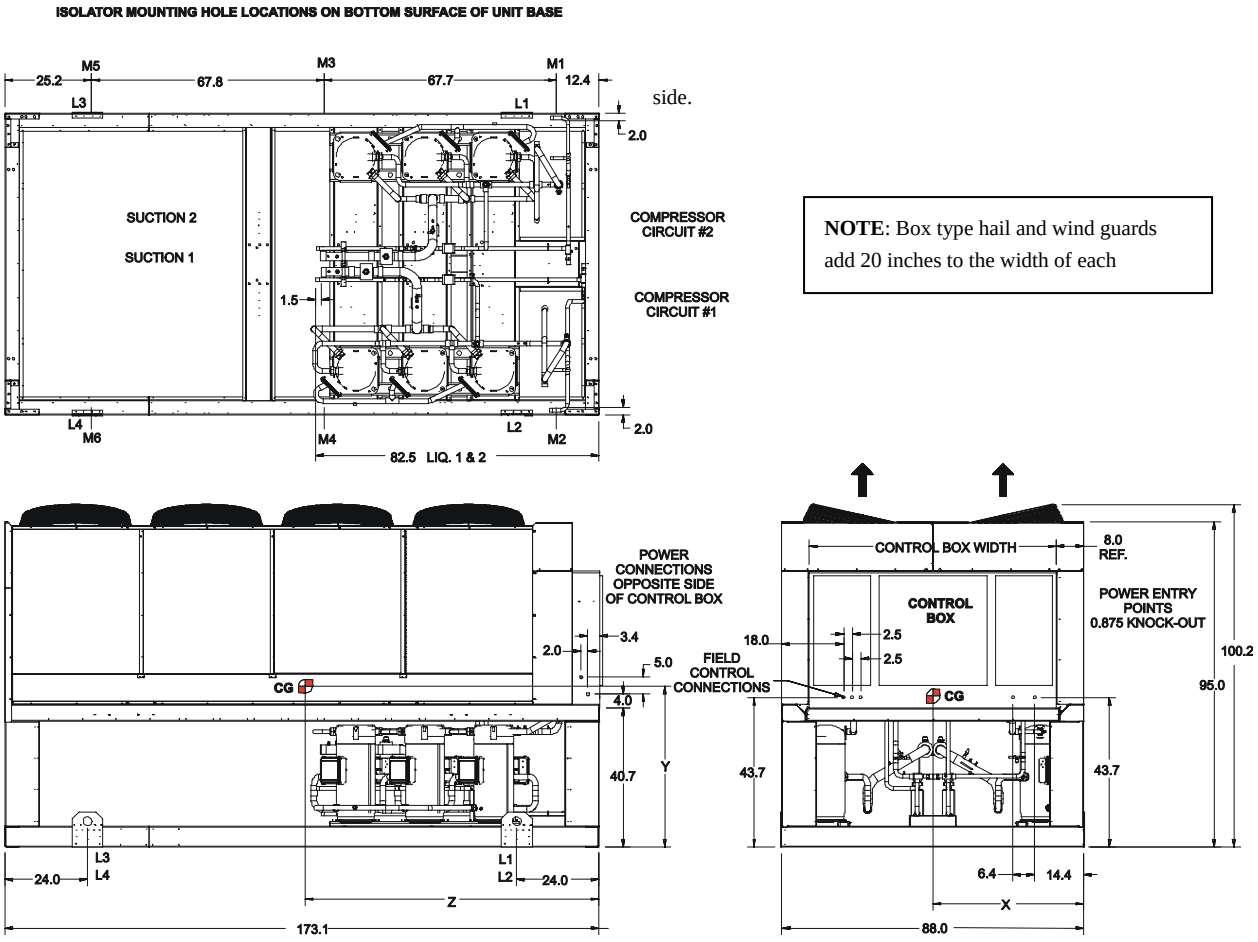
Figure 15, Dimensions, AGZ 075CB – 100CB, w/ Remote Evaporator



NOTE: Box type hail and wind guards add 20 inches to the width of each side.

UNIT MODEL	CG LOCATION (in.)			SHIPPING WEIGHT (lbs)	OPERATING WEIGHT (lbs)	LIFTING WEIGHT BY CORNER (lbs)				REFRIG CONNECTIONS (in.)		
	X	Y	Z			L1	L2	L3	L4	SUCT. O.D.	LIQ. O.D.	HGBP O.D.
AGZ075C	43.9	44.8	54.2	5065	5225	1657	1650	881	878	2.625	1.125	1.125
AGZ080C	44.1	46.6	51.9	5160	5320	1747	1756	827	831	2.625	1.125	1.125
AGZ090C	43.9	47.4	52.3	5220	5390	1764	1757	851	848	2.625	1.125	1.125
AGZ100C	43.9	47.4	52.3	5300	5480	1791	1784	864	861	2.625	1.125	1.125

Figure 16, Dimensions, AGZ 100CB – 130CB, w/Remote Evaporator

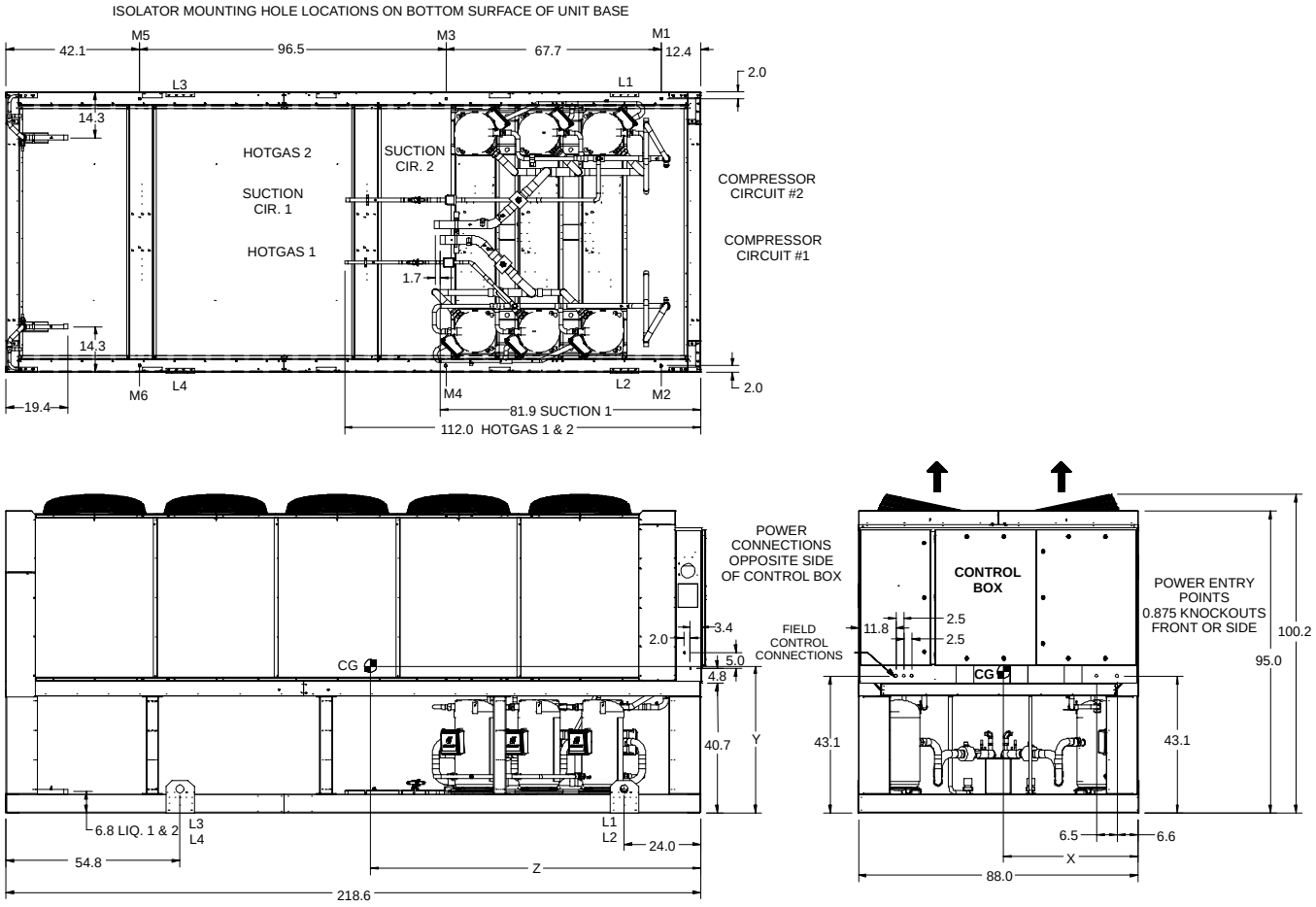


side.

NOTE: Box type hail and wind guards add 20 inches to the width of each

UNIT MODEL	CG LOCATION (IN)			SHIPPING WEIGHT (LBS)	OPERATING WEIGHT (LBS)	LIFTING WEIGHT BY CORNER (LBS)				REFRIGERANT CONNECTIONS (IN.)		
	X	Y	Z			L1	L2	L3	L4	SUCTION *O.D.	LIQUID *O.D.	HOTGAS *O.D.
AGZ110C	44.0	44.5	68.4	5830	6035	1880	1882	1034	1035	2.625	1.125	1.125
AGZ125C	43.4	45.5	68.4	5995	6215	1961	1906	1079	1049	2.625	1.125	1.125
AGZ130C	44.0	47.0	68.2	6085	6315	1967	1967	1075	1075	2.625	1.125	1.125

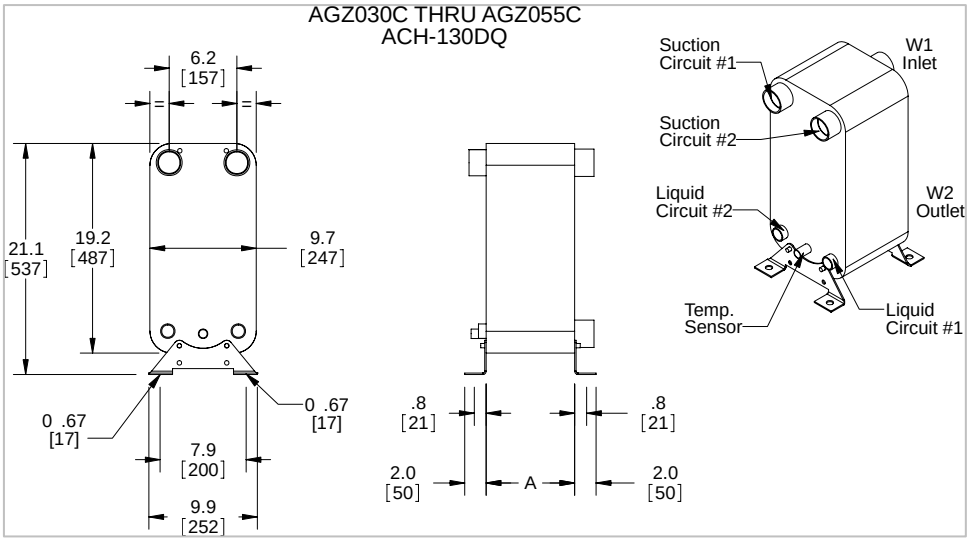
Figure 17, Dimensions, AGZ140CB - 180CB, Remote Evaporator

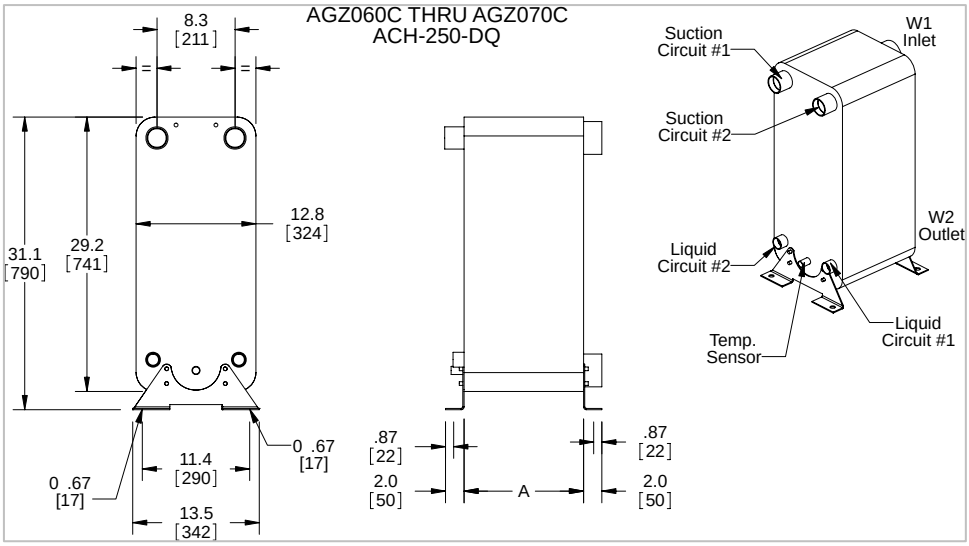


UNIT MODEL	CG LOCATION (IN)			SHIPPING WEIGHT (LBS)	OPERATING WEIGHT (LBS)	LIFTING WEIGHT BY CORNER (LBS)				REFRIGERANT CONNECTIONS (IN.)		
	X	Y	Z			L1	L2	L3	L4	SUCTION O.D.	LIQUID O.D.	HOTGAS O.D.
AGZ140C	43.4	46.1	85.3	9155	9530	2608	2537	2033	1977	2.625	1.375	1.125
AGZ160C	43.0	42.8	84.6	9320	9680	2700	2578	2068	1974	2.625	1.375	1.125
AGZ180C	43.4	39.6	84.2	9470	9830	2734	2658	2068	2011	2.625	1.375	1.125

Remote Evaporators

Figure 18, Remote Evaporators, AGZ 030CB - 130CB





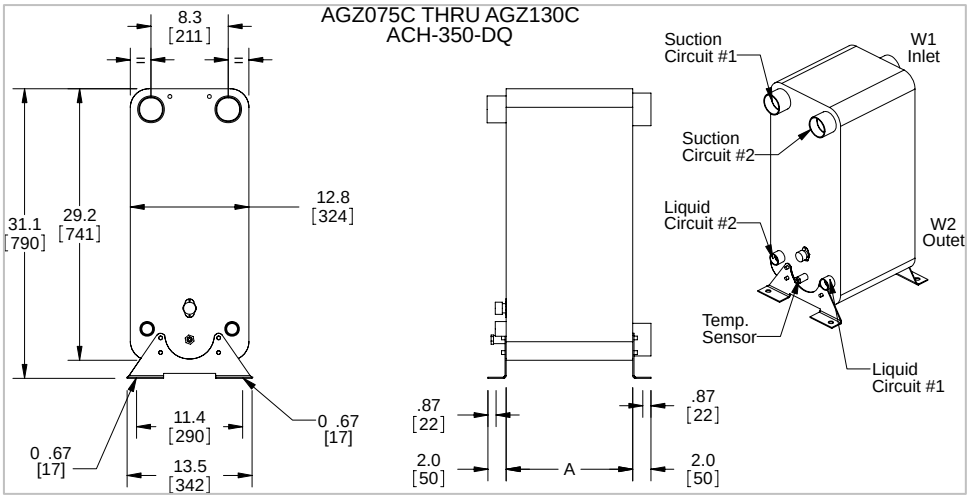
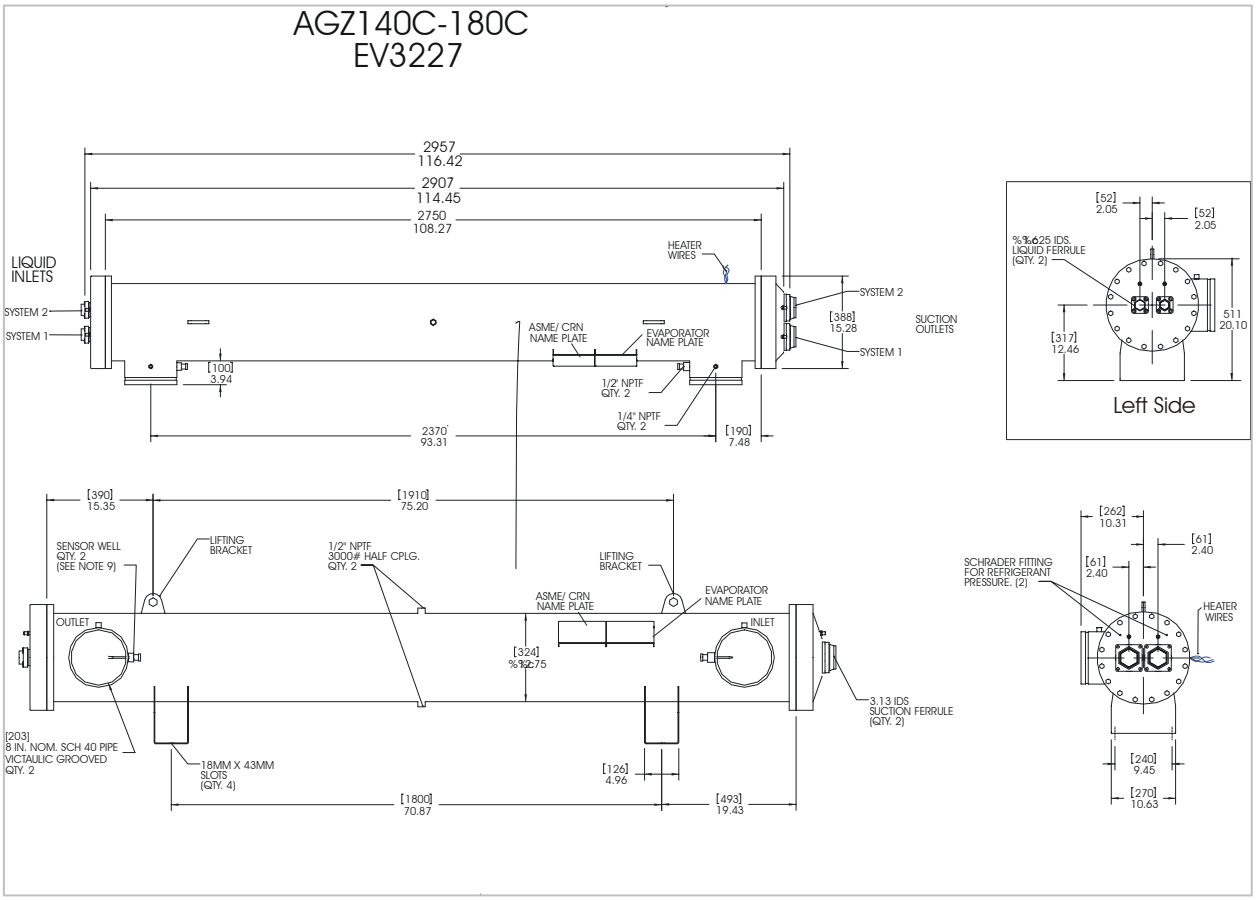


Figure 19, Remote Evaporators, AGZ 140CB - 180CB



Sound Isolation

The low sound level of the AGZ chiller 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 may be objectionable. Reduce structurally transmitted sound by isolating water lines, electrical conduit and the unit itself. Use wall sleeves and rubber isolated piping hangers to reduce transmission of water 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, Mounting Locations, and Weights

Vibration isolators are recommended for all roof-mounted installations or wherever vibration transmission is a consideration. Table 40 lists isolator loads for all unit sizes.

The unit should be initially placed on shims or blocks at the listed free height. When all piping, wiring, flushing, charging, etc. is completed, the springs are adjusted upward to loosen the blocks or shims that are then removed.

A rubber anti-skid pad is part of the isolator. Installation of spring isolators requires flexible piping connections and at least three feet of flexible conduit to avoid straining the piping and transmitting vibration and noise.

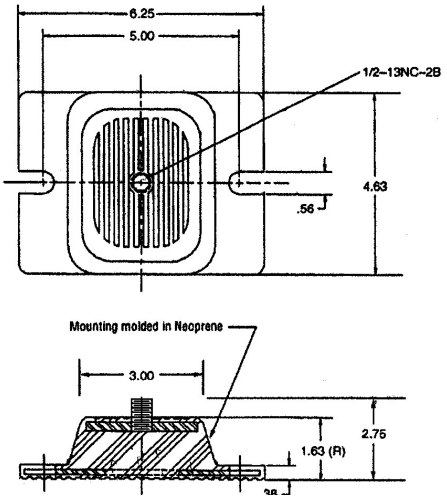
Isolators are also recommended for slab installations, primarily to keep the unit base from resting its entire length directly on the slab.

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.

RP-4, Neoprene-in-Shear Dimensions



CP-2, Spring Isolator Dimensions

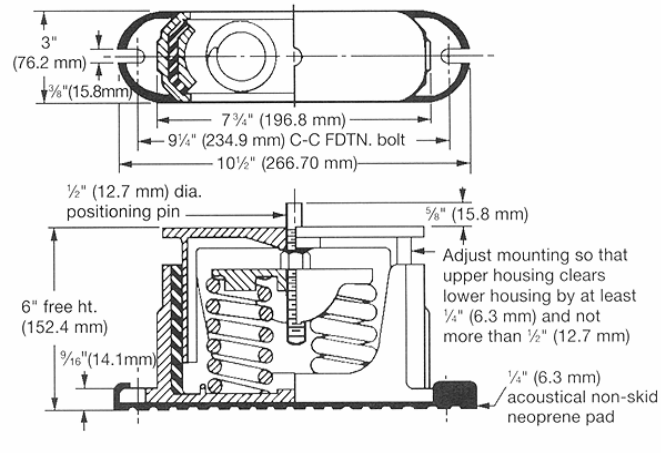


Figure 20, Mounting Locations

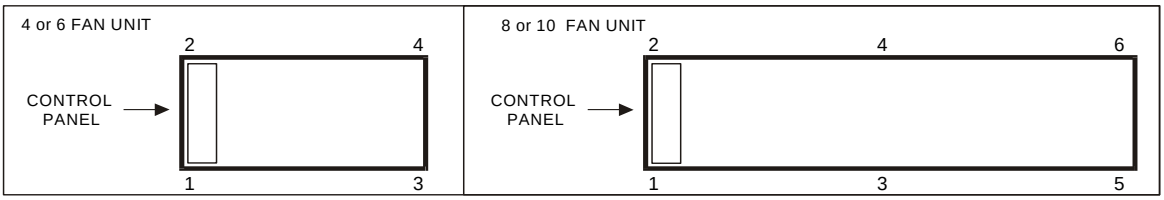


Table 40, AGZ-CH, Packaged Unit, Isolator Loads at Each Mounting Location (With Al Fins)

Unit Size	Fan Qty		Shipping Weight	Operating Weight	Location M1	Location M2	Location M3	Location M4	Location M5	Location M6	Copper Fins Add
					Front-Right	Front-Left	Rear-Right	Rear-Left	NA	NA	Note 1
AGZ030C	4	lbs	3180	3195	1042	785	780	588	-	-	79
		kg	1442	1449	473	356	354	267	-	-	36
AGZ035C	4	lbs	3185	3205	1045	790	780	590	-	-	79
		kg	1445	1454	474	358	354	268	-	-	36
AGZ040C	4	lbs	3265	3285	1060	811	800	614	-	-	88
		kg	1481	1490	481	368	363	279	-	-	40
AGZ045C	4	lbs	3420	3445	1093	854	841	657	-	-	133
		kg	1551	1563	496	387	381	298	-	-	60
AGZ050C	4	lbs	3495	3525	1120	880	854	671	-	-	133
		kg	1585	1599	508	399	387	304	-	-	60
AGZ055C	4	lbs	3525	3555	1125	891	860	679	-	-	133
		kg	1599	1613	510	404	390	308	-	-	60
AGZ060C	4	lbs	3710	3760	1190	951	899	720	-	-	133
		kg	1683	1706	540	431	408	327	-	-	60
AGZ065C	4	lbs	3740	3795	1198	966	903	728	-	-	158
		kg	1696	1721	543	438	410	330	-	-	72
AGZ070C	4	lbs	4150	4205	1333	954	1118	800	-	-	158
		kg	1882	1907	605	433	507	363	-	-	72
AGZ075C	6	lbs	5460	5510	1710	1680	1070	1050	-	-	200
		kg	2477	2499	776	762	485	476	-	-	91
AGZ080C	6	lbs	5545	5600	1770	1770	1030	1030	-	-	200
		kg	2515	2540	803	803	467	467	-	-	91
AGZ090C	6	lbs	5645	5710	1777	1742	1105	1086	-	-	238
		kg	2561	2590	806	790	501	493	-	-	108
AGZ100C	6	lbs	5750	5815	1814	1778	1123	1100	-	-	238
		kg	2608	2638	823	807	509	499	-	-	108

Unit Size	Fan Qty		Shipping Weight	Operating Weight	Location M1	Location M2	Location M3	Location M4	Location M5	Location M6	Copper Fins Add
					Front-Right	Front-Left	Mid-Right	Mid-Left	Rear-Right	Rear-Left	Note 1
AGZ110C	8	lbs	7200	7270	1512	1512	1211	1212	911	912	178
		kg	3266	3298	686	686	549	550	413	414	81
AGZ125C	8	lbs	7420	7500	1583	1540	1267	1233	951	926	195
		kg	3366	3402	718	699	575	559	431	420	89
AGZ130C	8	lbs	7570	7665	1617	1574	1294	1260	971	849	212
		kg	3434	3477	733	714	587	572	440	385	96
AGZ140C	10	lbs	9155	9530	1732	1686	1626	1581	1473	1432	266
		kg	4153	4323	786	765	738	717	668	650	121
AGZ160C	10	lbs	9320	9680	1794	1713	1669	1593	1491	1420	266
		kg	4228	4391	814	777	757	723	676	644	121
AGZ180C	10	lbs	9470	9830	1817	1767	1681	1634	1487	1444	266
		kg	4296	4459	824	802	763	741	675	655	121

NOTE

1. Additional weight for copper coils is per mounting location.
2. Locations are looking at the unit's control panel; see Figure 20

Table 41, AGZ-CB, Remote Evaporator, Isolator Loads at Each Mounting Location (With Al. Fins)

Unit Size	Fan Qty		Shipping Weight	Operating Weight	Location						Copper Fins Add (1)
					M1 Front-Rt	M2 Front-Left	M3 Rear-Rt	M4 Rear-Left	M5 -	M6 -	
AGZ030C	4	lbs	3070	3130	1032	753	778	567	-	-	79
		kg	1393	1420	468	342	353	257	-	-	36
AGZ035C	4	lbs	3070	3130	1032	753	778	567	-	-	79
		kg	1393	1420	468	342	353	257	-	-	36
AGZ040C	4	lbs	3115	3195	1043	765	800	587	-	-	88.5
		kg	1413	1449	473	347	363	266	-	-	40
AGZ045C	4	lbs	3260	3360	1082	806	844	628	-	-	133
		kg	1479	1524	491	366	383	285	-	-	60
AGZ050C	4	lbs	3280	3380	1090	811	848	631	-	-	133
		kg	1488	1533	494	368	385	286	-	-	60
AGZ055C	4	lbs	3300	3410	1079	754	928	649	-	-	133
		kg	1497	1547	489	342	421	294	-	-	60
AGZ060C	4	lbs	3320	3430	1125	743	941	621	-	-	133
		kg	1506	1556	510	337	427	282	-	-	60
AGZ065C	4	lbs	3350	3470	1136	751	953	630	-	-	158
		kg	1520	1574	515	341	432	286	-	-	72
AGZ070C	4	lbs	3580	3700	1194	788	1035	683	-	-	158
		kg	1624	1678	542	357	469	310	-	-	72
AGZ075C	6	lbs	5065	5225	1625	1618	993	989	-	-	200
		kg	2297	2370	737	734	450	449	-	-	91
AGZ080C	6	lbs	5160	5320	1701	1710	952	957	-	-	200
		kg	2341	2413	772	776	432	434	-	-	91
AGZ090C	6	lbs	5220	5390	1722	1715	979	974	-	-	238
		kg	2368	2445	781	778	444	442	-	-	108
AGZ100C	6	lbs	5300	5480	1751	1744	995	990	-	-	238
		kg	2404	2486	794	791	451	449	-	-	108

Unit Size	Fan Qty		Shipping Weight	Operating Weight	Location M1	Location M2	Location M3	Location M4	Location M5	Location M6	Copper Fins Add
					Front-Right	Front-Left	Mid-Right	Mid-Left	Rear-Right	Rear-Left	Note 1
AGZ110C	8	lbs	5830	6035	1255	1256	1005	1006	756	757	178.5
		kg	2644	2737	569	570	456	456	343	343	81
AGZ125C	8	lbs	5995	6215	1324	1287	1051	1021	777	755	195.5
		kg	2719	2819	601	584	477	463	352	342	89
AGZ130C	8	lbs	6085	6315	1331	1332	1052	1052	774	774	212.5
		kg	2760	2864	604	604	477	477	351	351	96
AGZ140C	10	lbs	8120	8380	1690	1638	1452	1407	1114	1079	266
		kg	3683	3801	767	743	659	638	505	489	121
AGZ160C	10	lbs	8240	8510	1748	1659	1492	1415	1127	1069	266
		kg	3738	3860	793	753	677	642	511	485	121
AGZ180C	10	lbs	8350	8630	1764	1707	1499	1451	1123	1086	266
		kg	3788	3915	800	774	680	658	509	493	121

Note: Additional weight for Copper Finned Coils is per unit mounting location.

Table 42, Isolator Kit Numbers

Model	030, 035	040, 045	055, 060	065, 070	075, 080 090, 100	110, 125 130	140, 160 180
Spring Kit Part No.	331776301	331776301	331776301	331776302	331776303	331776304	331776305
R-I-S Kit Part No.	331776401	331776401	331776401	331776401	331776402	331776403	331776404

Application Data

Unit Placement

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. Use a one-piece concrete slab with footings extended below the frost line. 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 50.

Figure 21, Clearances

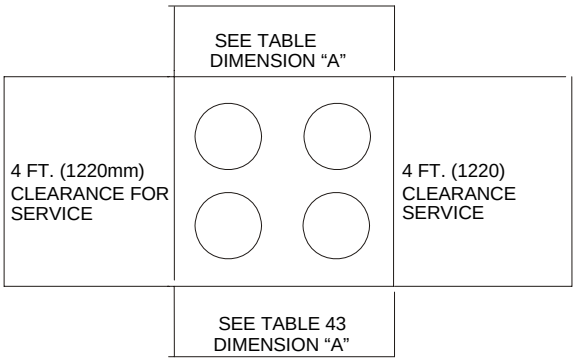


Table 43, Recommended Minimum Clearances

Model Size	Coil Side “A”	“B”	“C”	End Opposite Controls	Control Panel End	Evaporator Removal
030C – 070C	4 (1.2)	8	6	4 (1.2)	4 (1.2)	Nothing Extra
075C – 180C	6 (1.8)	12	8	4 (1.2)	4 (1.2)	Nothing Extra

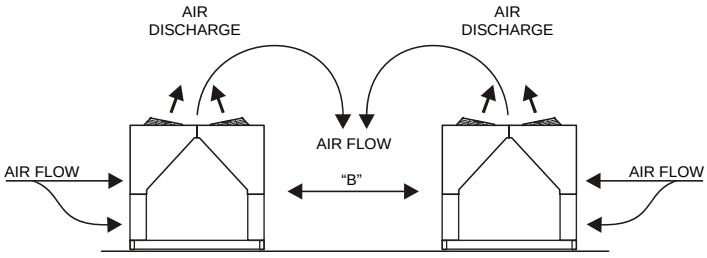
NOTE: Dimensions in ft (m).

Clearances

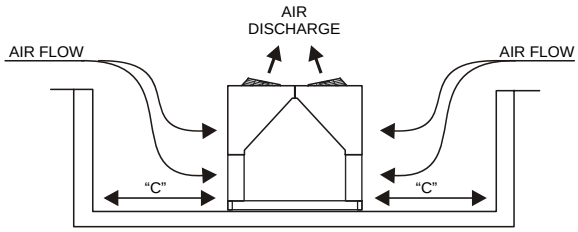
Do not block the flow of air to and from the condenser coil. Restricting airflow or allowing air recirculation will result in a decrease in unit performance and efficiency because discharge pressures are increased. There must be no obstruction above the unit that would deflect discharge air downward where it could be re-circulated 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 and other obstructions to permit adequate airflow for proper operation.



The recommended minimum side clearance between two units is dimension “B’ in Table 49.



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 49.

Restricted Air Flow

General

The clearances required for design-life operation of AGZ air-cooled condensers 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.

Fortunately, the McQuay AGZ chillers have several features that can mitigate the penalties attributable to restricted airflow.

- The condenser section is “W” shaped, as shown below. This 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 circuit. Every compressor set has its own independent 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 unit running (possibly at reduced capacity) rather than allowing a complete 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.

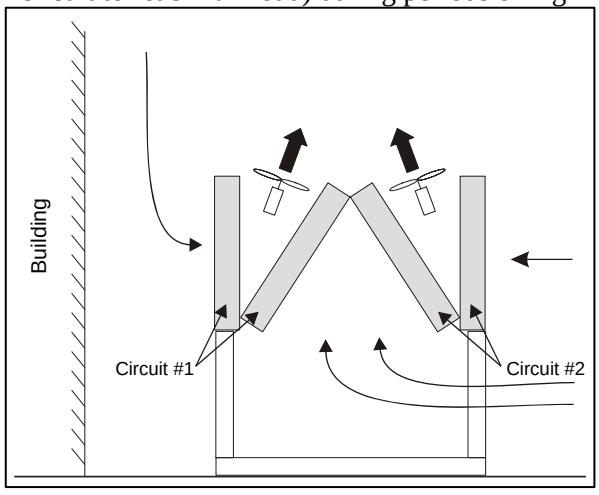


Figure 23, Coil and Fan Arrangement

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 chiller 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. Circuits opposite the wall are unaffected.

When close to a wall, it is desirable to place chillers on the North or East side of the walls. It is also desirable to 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.

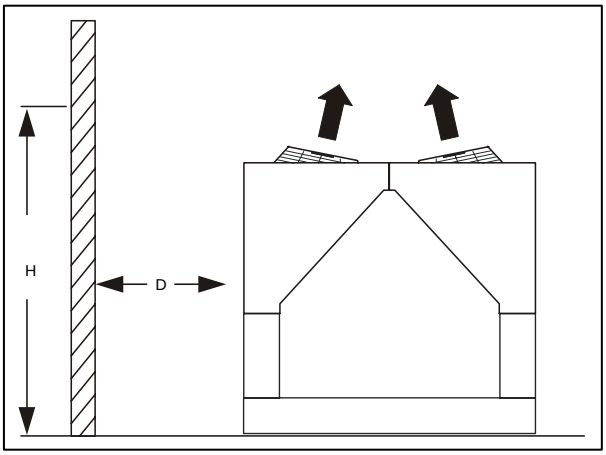
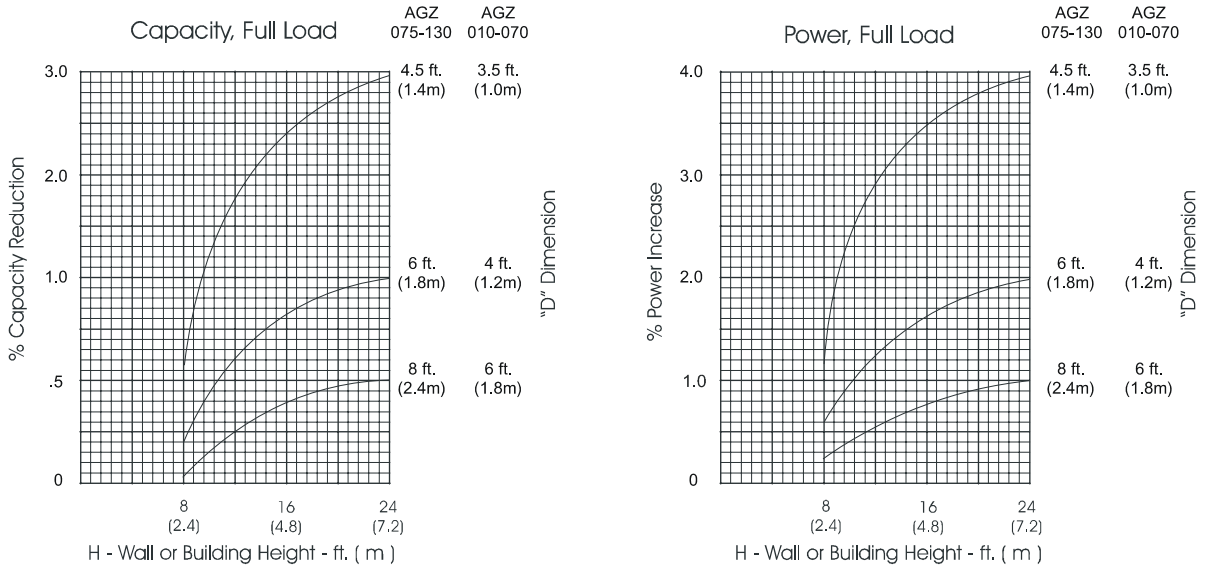


Figure 22, Unit Adjacent to Wall

Figure 24, 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 (2.5 meters) 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 25, Two Units Side by Side

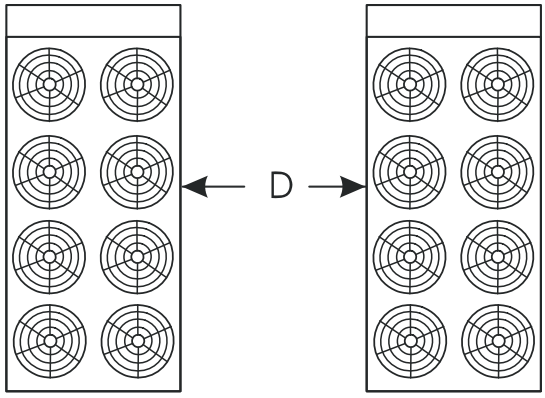
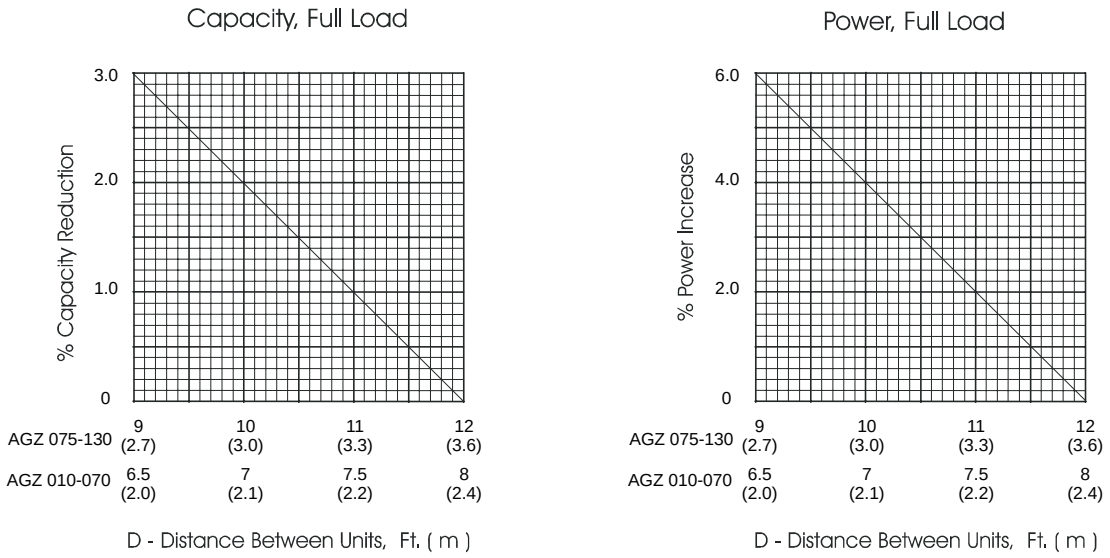


Figure 26, Adjustment Factor



Case 3, Three or More Units Side By Side

When three or more units are side by side, the outside chillers (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 27, Three or More Units

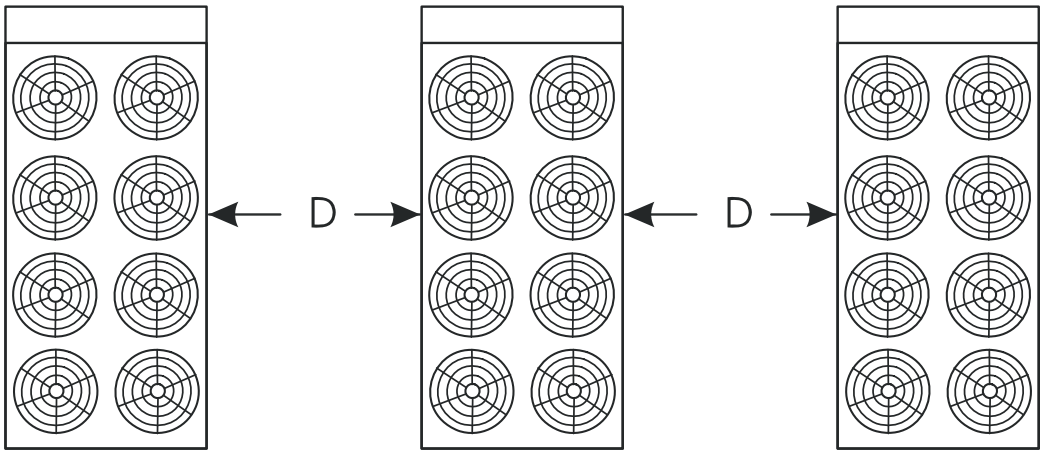
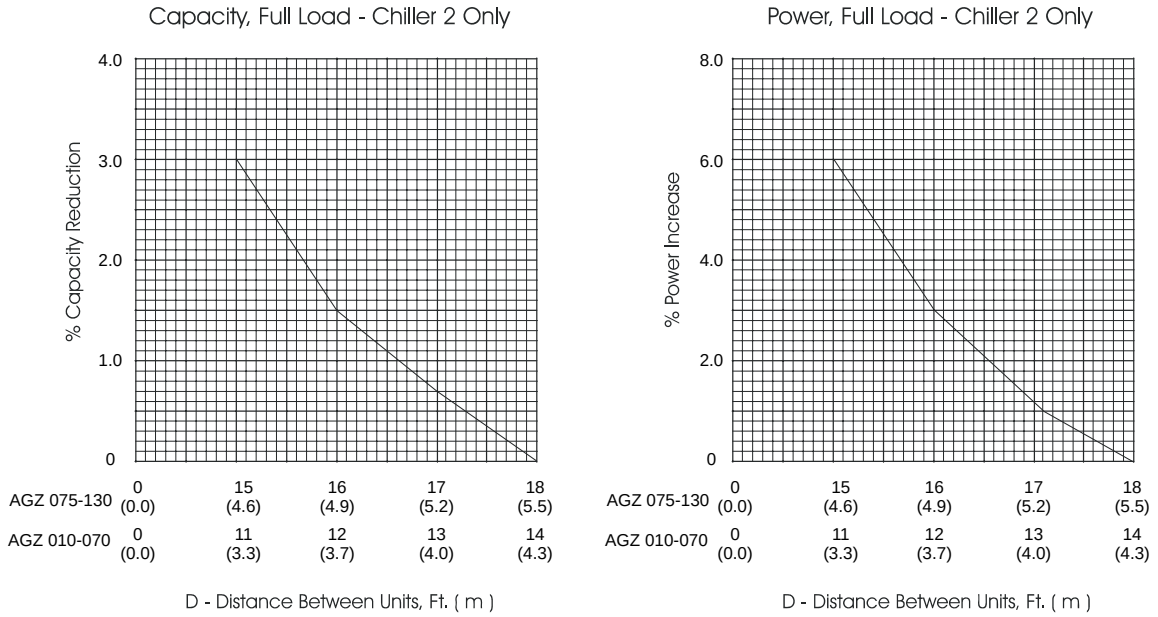


Figure 28, Adjustment Factor



Case 4, Open Screening Walls

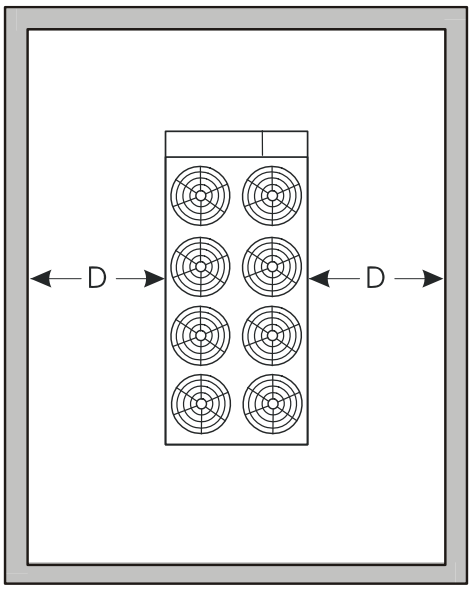
Decorative screening walls are often used to help conceal a unit either on grade or on a rooftop. These walls should be designed such that the combination of their open area and distance from the unit do not require performance adjustment. It is assumed that the wall height is equal to or less than the 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.

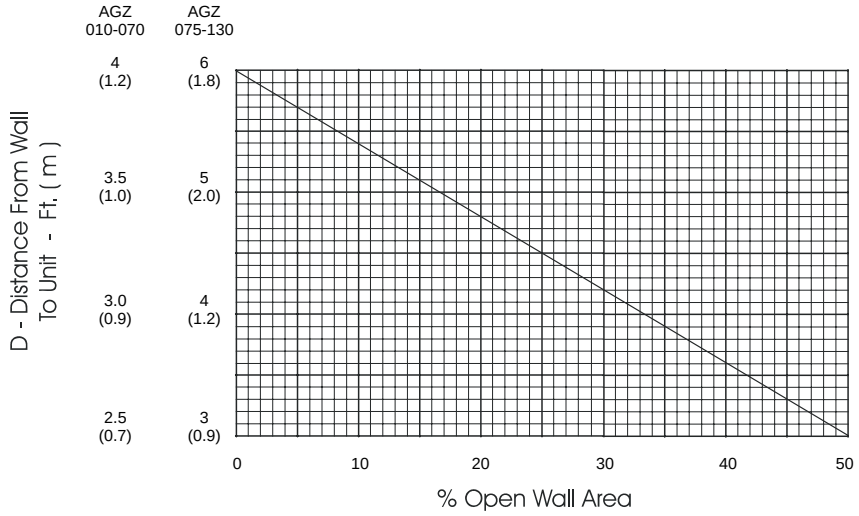
The distance from the ends of the unit to the end walls should be sufficient for service, opening control panel doors, and pulling evaporator tubes, as applicable.

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 29, Open Screening Walls

Figure 30, Wall Free Area vs Distance





Case 5, Pit/Solid Wall Installation

Pit installations can cause operating problems. 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 to make sure it has sufficient air-flow characteristics. The installation design engineer must approve the work to avoid an unreasonable risk of accident.

Figure 31, Pit Installation

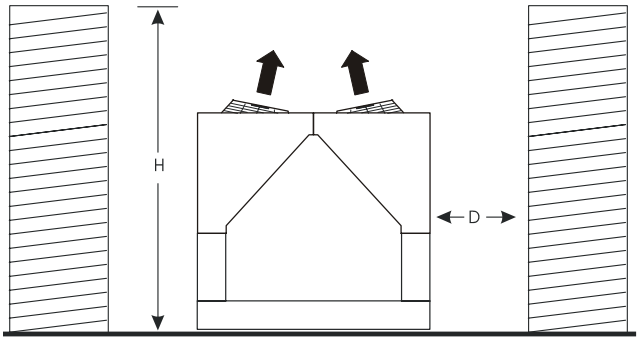
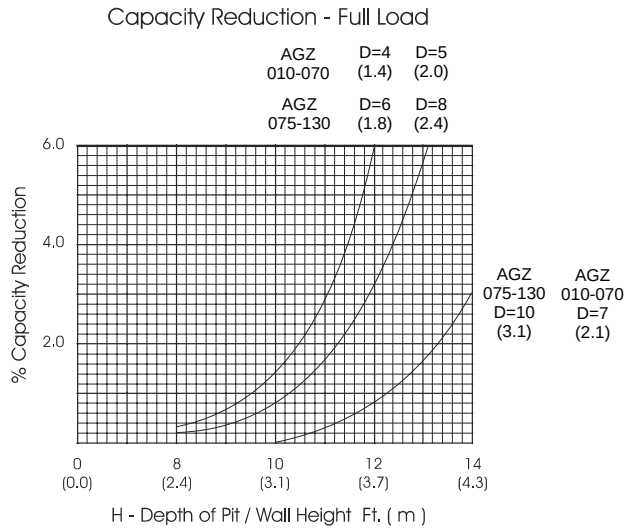
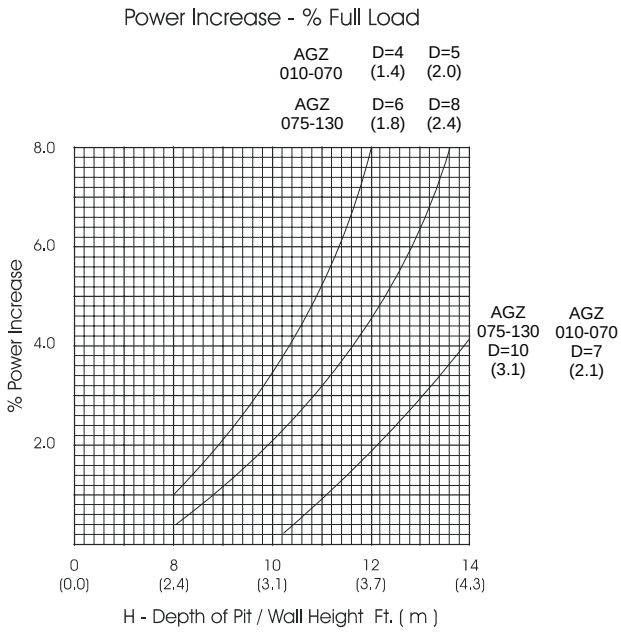


Figure 32, Adjustment Factor





Chilled Water Piping

Flush the system water piping thoroughly before making connections to the unit evaporator. Be sure to install a strainer (40-mesh for models AGZ 030 through 070 and 20-mesh for AGZ 075 through 130) in the return water line before the inlet to the chiller. Design the water piping so the chilled water circulating pump discharges into the evaporator inlet.

Connect the return water line to the evaporator inlet connection. Connect the supply water line to the evaporator outlet connection.

Install a flow switch in the horizontal piping of the supply (evaporator outlet) water line.

Provide drain connections at low points in the system to permit complete drainage of the system. Locate air vents at the high points in the system to purge air out of the system. A vent connection on top of the evaporator vessel allows air to be purged out of the evaporator. Purge air from the water system before unit start-up to provide adequate flow through the evaporator.

Install pressure gauges in the inlet and outlet water lines to the evaporator. Measure pressure drop through the evaporator and compare to flow as shown in Table 9. Vibration eliminators are recommended in both the supply and return water lines.

Insulate chilled water piping to reduce heat loss and prevent condensation. Chillers not running in the winter should have their water systems thoroughly drained to protect against freezing. If the chiller operates year-round, or if the system is not drained for the winter, protect the chilled water piping exposed to outdoor temperature against freezing. Wrap the lines with a heater cable and add proper amount of glycol to the system to further protect the system.

The thermostat sensor is factory mounted in the leaving water well. If an optional high return water sensor is provided, install sensor bulb in a field supplied tee or strap to the outside of the water line.

Water Flow Limitations

Constant Flow

The evaporator flow rates and pressure drops shown on page 32 are for full load design purposes. The maximum flow rate and pressure drop are based on a 6-degree temperature drop. Avoid higher flow rates with resulting lower temperature drops to prevent potential control problems resulting from very small control bands and limited start up/shut off temperature changes.

The minimum flow and pressure drop is based on a full load evaporator temperature drop of 16-degrees.

Evaporator flow rates 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.

Variable Flow

The full load, minimum flow limitation for constant flow is not to be confused with the part-load minimum flow rate that must be maintained for chillers operating in primary *variable* flow pumping systems. As chiller capacity drops, the flow rate for this pumping system will reduce proportionally. See the following table for the *part-load* minimum flow rates.

Other design practices for variable flow systems requiring a range of evaporator flow rates can be found below.

These minimum flow rates assume that flow will be reduced proportionally to the cooling load.

Table 44, Minimum Part-load Flow Rates

AGZ Model	030	035	040	045	050	055	060	065	070	075
Minimum Part-load Flow (GPM)	29	32	35	41	45	50	53	55	61	69
AGZ Model	**080**	**090**	**100**	**110**	**125**	**130**	**140**	**160**	**180**	
Minimum Part-load Flow (GPM)	76	84	96	100	110	120	200	227	254	

Variable Speed Pumping

Variable water flow involves changing the water flow through the evaporator as the load changes. 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 32. 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.

Figure 33, Typical Piping, Shell and Tube Evaporator

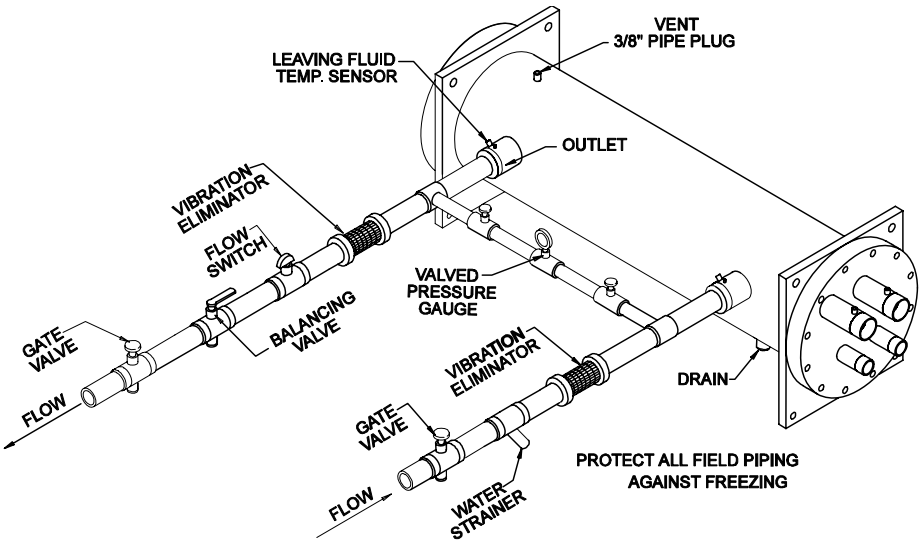
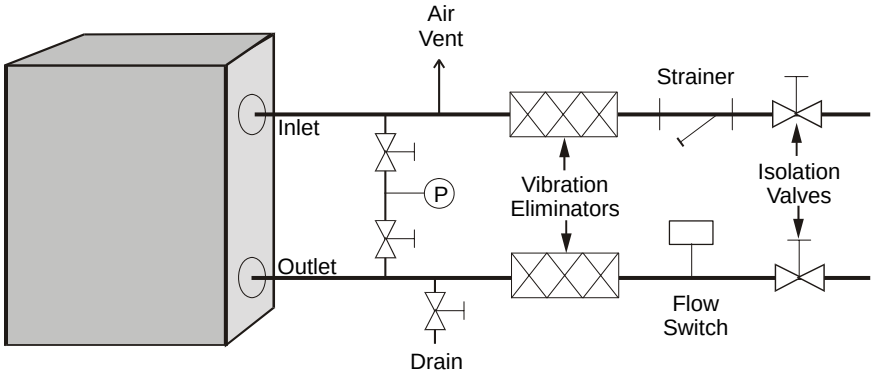


Figure 34, Typical Piping, Brazed-Plate Evaporator



Piping for units with brazed-plate evaporators must have a drain and vent connection provided in the bottom of the lower connection pipe and to the top of the upper connection pipe respectively. These evaporators do not have drain or vent connections due to their construction.

Temperature and Water Flow Limitations

Compressor loading and unloading is adaptively determined by system load, ambient air temperature, and other inputs to the MicroTech II control. A low ambient option with fan VFD allows operation down to -10° F (-23° 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 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.

System Water Volume Considerations

All chilled water systems need adequate time to recognize a load change, respond to that load change and stabilize, without undesirable short cycling of the compressors or loss of control. In air conditioning systems, the potential for short cycling usually exists when the building load falls below the minimum chiller plant capacity or on close-coupled systems with very small water volumes.

Some of the things the designer should consider when looking at water volume are the minimum cooling load, the minimum chiller plant capacity during the low load period and the desired cycle time for the compressors.

Assuming that there are no sudden load changes and that the chiller plant has reasonable turndown, a rule of thumb of “gallons of water volume equal to two to three times the chilled water gpm flow rate” is often used.

A properly designed storage tank should be added if the system components do not provide sufficient water volume.

Evaporator Freeze Protection

Evaporator freeze-up can be a concern in the application of air-cooled water chillers. To protect against freeze-up, insulation and an electric heater cable are furnished with the unit. This protects the evaporator down to -20° F (-29° C) ambient air temperature. Although the evaporator is equipped with freeze protection, it does not protect water piping external to the unit or the evaporator itself if there is a power failure or heater cable burnout. Consider the following recommendations for additional protection.

1. If the unit will not be operated during the winter, drain evaporator and chilled water piping and flush with glycol. Drain and vent connections are provided on the evaporator to ease draining.
2. Add a glycol solution to the chilled water system to provide freeze protection. Freeze point should be approximately ten degrees below minimum design ambient temperature.
3. The addition of thermostatically controlled heat and insulation to exposed piping.
4. Continuous circulation of water through the chilled water piping and evaporator.

The evaporator heater cable is factory wired to the 115 volt circuit in the control box. This power should be supplied from a separate source, but it can be supplied from the control circuit. Operation of the heater cable is automatic through the ambient sensing thermostat that energizes the evaporator heater cable for protection against freeze-up. Unless the evaporator is drained in the winter, the disconnect switch to the evaporator heater must not be open.

Remote Evaporator

Refrigerant Piping for AGZ-Remote Evaporators

(See Figure 2 on Page 9) 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.

Refrigerant piping design, installation, and any associated procedures must be in accordance with ASHRAE published practice, EPA regulations and local codes.

Refrigerant specialties including the expansion valves, solenoid valves, filter drier and sight glasses for use with the remote evaporator applications 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/solenoid valve option can be factory mounted or provided as a field installed kit option for installation in the field.

The outdoor compressor/condenser section for remote evaporator applications has a liquid line shut off valve and a suction shut off valve

provided as standard. A holding charge of R-410a is provided for the evaporator and an outdoor section. The installer must properly evacuate the piping system and provide the operating charge of R-410a. Refer to the piping schematic drawing on page 9 for additional details.

McQuay offers the following piping recommendations; however, the design engineer is responsible for correctly piping the HVAC system:

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 superior 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 not to exceed more than 20 feet 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 .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.

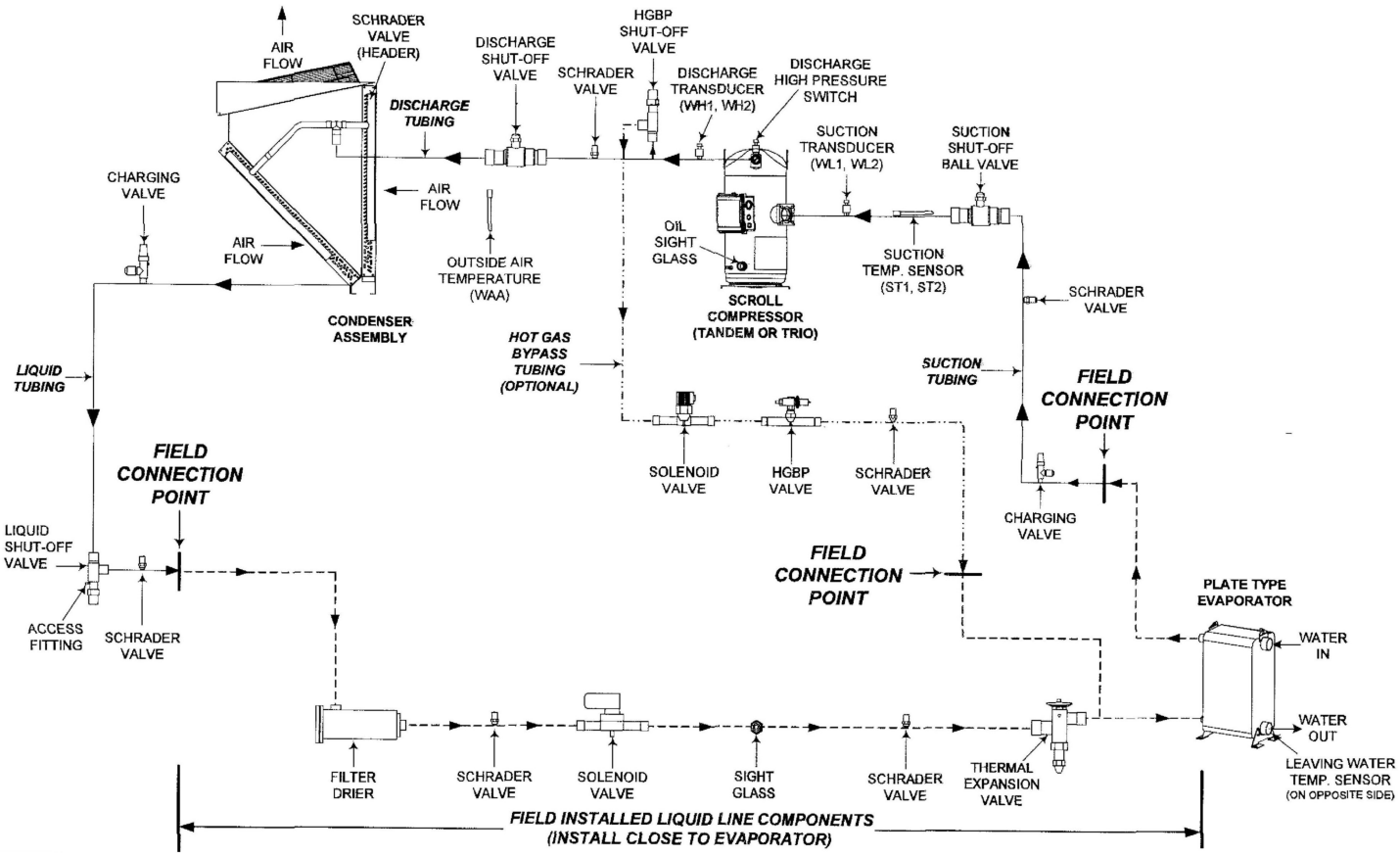
It is recommended that the piping systems always extend above the highest component in the refrigeration system before dropping down to make the final refrigerant connections to components. This practice will hinder the draining of condensed refrigerant to the lower component when normal shutdown procedures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

NOTE: Do not run refrigerant piping underground.

Pumpdown

The pumpdown capacity of AGZ units is given in the Physical Data Tables on page 50. Care should be exercised to include all equipment and lines when calculating the system charge relative to pumpdown capacity on remote evaporator units. The AGZ remote evaporators have an insignificant operating charge.

Figure 35, Remote Evaporator Field Piping



Operating/Standby Limits

Maximum standby ambient air temperature, 130° F (55° C)

Maximum operating ambient air temperature

Standard Unit – up to 110° F (43.3° C)

Optional High Ambient Kit – above 110° F (43.3° C) to 125° F (51.7° C)

Minimum operating ambient temperature (standard), 35° F (2° C)

Minimum operating ambient temperature (with optional low-ambient control), -10° F (-23° C)

Leaving chilled water temperature, 40° F to 60° F (4.4° C to 15.6° C)

Leaving chilled fluid temperatures (with anti-freeze), 15° F to 60° F (-9° C to 16° C)

Design chilled water Delta-T range, 6 degrees F to 16 degrees F (3.3 degrees C to 8.9 degrees C)

Part-load minimum flow for variable flow systems, varies with unit size, see page 82.

Maximum operating inlet fluid temperature, 76° F (24° C)

Maximum non-operating inlet fluid temperature, 100° F (3 8° C)

Electric power supply, see page 35.

Warranty Statement

Limited Warranty

Consult your local McQuay Representative for warranty details. Refer to Form 933-430285Y. To find your local McQuay Representative, go to www.mcquay.com.

Optional Features

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

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

Water Flow Switch

(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.

Remote Operator Interface Panel

A remote interface panel, field wired to the unit, providing all the data viewable on the unit's controller, including alarm clearing and setpoint change capability. See page 12 for details.

BAS Interface (Open Choices™)

A module is factory installed on the MicroTech II controller to provide the interface to the following standard protocols:

BACnet/IP
BACnet MS/TP
BACnet Ethernet
LonTalk (FTT-10A)
Modbus

Unit

Vibration Isolators

Spring or neoprene-in-shear vibration isolators are available for field installation to reduce vibration transmission through the unit base.

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.

Louvers (Hail Guards & Wind Baffles)

Available for the upper portion (condenser coils) or both the upper and lower portions of unit. Selecting both will completely enclose the unit with louvers. The louvers protect the coils from hail damage and also stabilize operation during windy, low ambient operation. See page 1 for photograph.

Copper Fin Condenser Coils

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

Black Fin Coils

Aluminum fin stock pre-coated 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 5000-hour salt spray resistance (ASTM B117-90).

Evaporator Insulation

Double insulation thickness (total of 1½ inch) for high humidity areas or low fluid temperatures.

Sound Reduction

Acoustical blankets are factory-installed on each compressor. They are also available for retrofit field installation.

Hail and Wind Guards

A field-mounted option shipped as a kit including panels, fasteners, and instructions.

Shut-off Valves
Factory mounted suction and discharge shut-off valves. Liquid line shutoff valve is standard.

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, non-fused 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
(P/N 350015201) 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 Ground Fault Circuit Interruption (GFCI) 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

Control Panel Exhaust Fan
Consists of an exhaust fan with rain hood, two inlet screens with filters, necessary controls and wiring to allow operation to 125ºF. The fan is required under certain circumstances and included with the unit. See page 34 for further information. The option can be factory-installed or field-installed as a kit.

Product Specification

Specifications are available in MSWord format. Contact the local McQuay sales office.

SECTION 15XXX
AIR-COOLED SCROLL COMPRESSOR CHILLERS
AGZ 030CH-AGZ 180CH

PART 1 - GENERAL

1.01 SUMMARY

Section includes design, performance criteria, refrigerants, controls, and installation requirements for air-cooled scroll compressor chillers.

1.02 REFERENCES

Comply with applicable Standards/Codes of ARI 550/590-2003, ANSI/ASHRAE 15, ETL, cETL, NEC, and OSHA as adopted by the State.

Units shall meet the efficiency standards of ASHRAE Standard 90.1, October 2001.

1.03 SUBMITTALS

A. Submit shop drawings and product data in accordance with the specifications.

B. Submittals shall include the following:

1. Dimensioned plan and elevation view drawings, required clearances, and location of all field connections.
2. Summary of all auxiliary utility requirements, such as electricity, water, compressed air, etc. Summary shall indicate quality and quantity of each required utility.
3. Single-line schematic drawing of the power field hookup requirements, indicating all items that are furnished.
4. Schematic diagram of control system indicating points for field interface/connection.
5. Diagram shall fully delineate field and factory wiring.
6. Certification of factory-run test of chiller unit signed by company officer.
7. Installation manuals.

1.04 QUALITY ASSURANCE

A. Qualifications: Equipment manufacturer must specialize in the manufacture of the products specified and have five years experience with the type of equipment.

B. Regulatory Requirements: Comply with the codes and standards specified.

C. Chiller manufacturer plant must be ISO9002 Registered.

1.05 DELIVERY AND HANDLING

A. Chillers shall be delivered to the job site completely assembled (except units with remote evaporators) and charged with refrigerant and oil by the manufacturer.

B. Comply with the manufacturer's instructions for rigging and handling equipment.

1.06. WARRANTY

The refrigeration equipment manufacturer's guarantee shall be for a period of one year from date of equipment start-up but not more than 18 months from shipment. The guarantee shall provide for repair or replacement due to failure by material and workmanship that prove defective within the above period, excluding refrigerant.

1.07 MAINTENANCE

Maintenance of the chillers shall be the responsibility of the owner and performed in accordance with the manufacturer's instructions.

PART 2--PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. McQuay International

B. (Approved Equal)

2.02 UNIT DESCRIPTION

Provide and install as shown on the plans factory-assembled, factory-charged, and factory-tested air-cooled, scroll compressor, packaged chillers in the quantity specified. Each chiller shall consist of hermetic tandem or triple scroll compressor sets (total of four or six compressors), direct expansion evaporator, air-cooled condenser section, microprocessor-based control system and all components necessary for controlled unit operation. Unit refrigerant will be R-410A.

2.03 DESIGN REQUIREMENTS

A. General: Provide a complete scroll compressor packaged chiller as specified herein and as shown on the drawings. The unit shall be in accordance with the standards referenced in section 1.02 and any local codes in effect.

B. Performance: Refer to the schedule of performance on the drawings. The chiller shall be capable of stable operation to a minimum of 50 percent of full load without hot gas bypass. Performance shall be in accordance with ARI Standard 550/590.

C. Acoustics: Sound pressure levels for the unit shall not exceed the following specified levels. The manufacturer shall provide the necessary sound treatment to meet these levels if required. Sound data shall be provided with the quotation. Test shall be in accordance with ARI Standard 370.

Octave Band								
63	125	250	500	1000	2000	4000	8000	dBA
____	____	____	____	____	____	____	____	____

2.04 CHILLER COMPONENTS

A. Compressors: The compressors shall be sealed hermetic, scroll type with crankcase oil heater and suction strainer. Compressor shall have a forced-feed lubrication system with a reversible oil pump and oil charge. The compressor motor shall be refrigerant gas cooled, high torque, hermetic induction type, two-pole, with inherent thermal protection on all three phases and shall be mounted on RIS vibration isolator pads.

B. Evaporators

Units up to 130 nominal tons:

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

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

The water-side working pressure shall be a minimum of650 psig (4500 kPa). Vent and drain connections shall be provided in the inlet and outlet chilled water piping by the installing contractor. Evaporators shall be designed and constructed according to, and listed by, Underwriters Laboratories (UL).

Units over 130 tons:

The evaporator shall be 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 shall have a carbon steel shell and seamless high efficiency copper tubes roller expanded into a carbon steel tube sheet.

Refrigerant heads shall be carbon steel with multi-pass baffles to provide oil return and be removable to permit access to the tubes from either end. For water removal, 3/8" (10mm) vent and drain plugs are provided on the top and bottom of the shell.

The evaporator shall have an electric resistance heater and be 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 shall have a K factor of at least 0.28 at 75° F (23° C).

The water side working pressure shall be 150 psig (1035 kPa). Each evaporator shall be 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.

C. Condenser: The condenser coils shall consist of 3/8 inch (10mm) seamless copper tubes mechanically bonded into plate-type fins. The fins shall have full drawn collars to completely cover the tubes. A subcooling coil shall be an integral part of the main condenser coil. Condenser fans shall be propeller type arranged for vertical air discharge and individually driven by direct-drive fan motors. They shall be equipped with a heavy-gauge fan guard. Fan motors shall be TEAO, three-phase, direct-drive, 1140 rpm.

D. Refrigerant Circuit: The refrigerant circuit shall include a refrigerant filter-drier, sight glass with moisture indicator, liquid line solenoid valve (no exceptions), thermal expansion valve, and insulated suction line.

E. Construction: Unit casing and all structural members and rails shall be fabricated of continuous G90 galvanized steel and painted to meet ASTM B117, 500-hour salt spray test.

F Control System: A centrally located weatherproof control panel shall contain the field power connection points, control interlock terminals, and control system. Power and starting components shall include factory circuit breaker of fan motors and control circuit, individual contactors for each fan motor, solid-state compressor three-phase motor overload protection, inherent fan motor overload protection and unit power terminal blocks for connection to remote disconnect switch. Terminals shall also be provided for power supply to the evaporator heater circuit. Hinged access doors shall be lockable. Barrier panels or separate enclosures are required to protect against accidental contact with line voltage when accessing the control system.

G An advanced DDC microprocessor unit controller with a 4-line by 20-character liquid crystal display provides the operating and protection functions. The controller shall take pre-emptive limiting action in case of high discharge pressure or low evaporator pressure.

The controller shall contain the following features as a minimum:

Equipment Protection

The unit shall be protected in two ways: (1) by alarms that shut the unit down and require manual reset to restore unit operation and (2) by limit alarms that reduce unit operation in response to some out-of-limit condition. Shut down alarms shall activate an alarm signal.

Shutdown Alarms

No evaporator water flow	Sensor failures
Low evaporator pressure	Evaporator freeze protection
High condenser pressure	Outside ambient temperature
Motor protection system	Phase voltage protection (Optional)

Limit Alarms

Condenser pressure stage down, unloads unit at high discharge pressures

Low ambient lockout, shuts off unit at low ambient temperatures

Low evaporator pressure hold, holds stage #1 until pressure rises

Low evaporator pressure unload, shuts off one compressor

Unit Enable Selection

Enables unit operation from either local keypad, digital input, or BAS

Unit Mode Selection

Selects standard cooling, ice, glycol, or test operation mode

Analog Inputs

Reset of leaving water temperature, 4-20 mA

Digital Inputs

- Unit off switch

- Remote start/stop
- Flow switch
- Ice mode switch, converts operation and setpoints for ice production
- Motor protection

Digital Outputs

- Shutdown alarm; field wired, activates on an alarm condition, off when alarm is cleared
- Evaporator pump; field wired, starts pump when unit is set to start

Condenser fan control

The unit controller shall provide control of condenser fans based on compressor discharge pressure.

Building Automation System (BAS) Interface

Factory mounted DDC controller(s) shall support operation on a BACnet®, Modbus® or LONMARK ® network via one of the data link / physical layers listed below as specified by the successful Building Automation System (BAS) supplier.

BACnet MS/TP master (Clause 9)

BACnet IP, (Annex J)

BACnet ISO 8802-3, (Ethernet)

LONMARK FTT-10A. The unit controller shall be LONMARK® certified.

The information communicated between the BAS and the factory mounted unit controllers shall include the reading and writing of data to allow unit monitoring, control and alarm notification as specified in the unit sequence of operation and the unit points list.

For chillers communicating over a LONMARK network, the corresponding LONMARK eXternal Interface File (XIF) shall be provided with the chiller submittal data.

All communication from the chiller unit controller as specified in the points list shall be via standard BACnet objects. Proprietary BACnet objects shall not be allowed. BACnet communications shall conform to the BACnet protocol (ANSI/ASHRAE135-2001). A BACnet Protocol Implementation Conformance Statement (PICS) shall be provided along with the unit submittal.

2.05 OPTIONS AND ACCESSORIES

The following options are to be included:

- Hot gas bypass to allow unit operation to 10 percent of full load
- Low ambient head pressure control to -10° F (-23° C)
- Non-fused disconnect switch with through-the-door handle
- Aluminum fins shall be pre-coated with a phenolic epoxy coating with 1000 hour salt spray rating (ASTM B117-90)

- Copper fin condenser coils
- *ElectroFin*™ baked epoxy coating providing 5000+ hour salt spray resistance (ASTM B117-90) and is applied to both the coil and the coil frames.
- Chilled water flow switch to be field mounted in the chilled water line and field wired to terminals in the control panel.
- Spring vibration isolators for field installation
- Rubber-in-shear vibration isolators for field installation
- Double evaporator insulation
- Compressor sound reduction package

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in strict accordance with manufacturer's requirements, shop drawings, and contract documents.

B. Adjust and level chiller in alignment on supports.

C. Coordinate electrical installation with electrical contractor.

D. Coordinate controls with control contractor.

3.02 START-UP

A. Install proper charge of refrigerant and oil.

B. Provide testing and starting of machine, and instruct the Owner in its proper operation and maintenance.

AIR-COOLED SCROLL COMPRESSOR CHILLERS
WITH REMOTE EVAPORATOR
AGZ 030CB- AGZ 180CB

PART 1 - GENERAL

1.01 SUMMARY

Section includes design, performance criteria, refrigerants, controls, and installation requirements for air-cooled scroll compressor chillers.

1.02 REFERENCES

Comply with applicable Standards/Codes of ARI 550/590-2003, ANSI/ASHRAE 15, ETL, cETL, ASME Section VIII, NEC, ASHRAE Standard 90.1, and OSHA as adopted by the State.

1.03 SUBMITTALS

A. Submit shop drawings and product data in accordance with the specifications.

B. Submittals shall include the following:

1. Dimensioned plan and elevation view drawings, required clearances, and location of all field connections.
2. Summary of all auxiliary utility requirements such as: electricity, water, compressed air, etc. Summary shall indicate quality and quantity of each required utility.
3. Single line schematic drawing of the power field hookup requirements, indicating all items that are furnished.
4. Schematic diagram of control system indicating points for field interface/connection.
5. Field installed refrigerant piping diagram with line sizes and refrigeration specialties shown.
6. Diagram shall fully delineate field and factory wiring.
7. Installation manuals.

1.04 QUALITY ASSURANCE

A. Qualifications: Equipment manufacturer must specialize in the manufacture of the products specified and have five years experience with the equipment offered.

B. Regulatory Requirements: Comply with the codes and standards specified.

C. Chiller manufacturer plant must be ISO9002 Registered.

1.05 DELIVERY AND HANDLING

A. The outdoor section and the remote evaporator shall be delivered to the job site with a holding charge.

B. Comply with the manufacturers instructions for rigging and handling equipment.

1.06. WARRANTY

The refrigeration equipment manufacturer’s warranty shall be for a period of one year from date of equipment start up but not more than 18 months from shipment. The warranty shall cover material and workmanship that prove defective within the above period and resultant loss of refrigerant.

1.07 MAINTENANCE

Maintenance of the chillers shall be the responsibility of the owner and performed in accordance with the manufacturer's instructions.

PART 2--PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. McQuay International

B. (Approved Equal)

2.02 UNIT DESCRIPTION

Provide and install as shown on the air-cooled scroll compressor chiller systems in the quantity specified. Each system shall consist of hermetic tandem or triple scroll compressors, air-cooled condenser section, control system and all components necessary for controlled unit operation. Unit refrigerant will be R-410A.

A multi-circuit, direct expansion, insulated evaporator shall be provided for remote location and wired and piped to the outdoor unit by the installing contractor.

2.03 DESIGN REQUIREMENTS

A. General: Provide a complete scroll compressor chiller system consisting of an outdoor compressor-condenser section and a remote indoor evaporator as specified herein and as shown on the drawings. The unit shall be in accordance with the standards referenced in section 1.02 and any local codes in effect.

B. Performance: Refer to the schedule of performance on the drawings. The chiller shall be able to operate to at least 25 percent of full load without hot gas bypass.

C. Acoustics: Sound pressure levels for the unit shall not exceed the following specified levels. The manufacturer shall provide the necessary sound treatment to meet these levels if required. Sound data shall be provided with the quotation and be measured at 30 feet from the unit and one meter above the unit base line

	Octave Band							
63	125	250	500	1000	2000	4000	8000	dBA
____	____	____	____	____	____	____	____	____

2.04 CHILLER COMPONENTS

A. Compressors: The compressors shall be two sets of tandem or triple hermetic scroll type compressors (total of four or six) with discharge service valve, crankcase oil heater and suction strainer. Compressors shall have a forced feed lubrication system with a reversible oil pump and factory oil charge. The compressor motors shall be refrigerant gas cooled, high torque, hermetic induction type, two-pole, with inherent thermal protection on all three phases and shall be mounted on RIS vibration isolator pads.

B. Remote Evaporator: Units up to 130 tons capacity shall have a direct expansion type, brazed-plate evaporator with stainless steel plates. They shall be insulated with 3/4 inch (19mm) closed cell polyurethane insulation and be heated with an electric heater to provide freeze protection to -20° F (-29° C) ambient temperature. Units over 130 tons shall have a direct expansion, shell and tube

evaporator with carbon steel shell and high efficiency copper tubes rolled into steel tube sheets. The refrigerant heads shall have multi-pass baffles to provide oil return and be removable to permit access to the tubes from either end. They shall be insulated with 3/4 inch (19mm) closed cell polymer insulation with a minimum K factor of 0.28 at 75ºF (23ºC) and be heated with an electric heater to provide freeze protection to -20° F (-29° C) ambient temperature. The refrigerant side working pressure shall be at least 225 psig (1552 kPa). The water side working pressure shall be at least 175 psig (1207 kPa). The evaporator must be designed, constructed, inspected, and stamped according to the ASME Code.

C. Condenser: The condenser coils shall consist of 3/8 inch (10mm) seamless copper tubes mechanically bonded into plate type fins. The fins shall have full drawn collars to completely cover the tubes. A subcooling coil shall be an integral part of the main condenser coil. Condenser fans shall be propeller type arranged for vertical air discharge and individually driven by direct drive fan motors. Each fan shall be in its own compartment to eliminate cross flow of condenser air during fan cycling and shall be equipped with a heavy-gauge vinyl coated fan guard. Fan motors shall be weather protected, three-phase, direct-drive, 1140 rpm, TEAO type. External coils shall have wire mesh protective guards.

D. Refrigerant Circuit: The refrigerant specialties shall be supplied by the unit manufacturer and include a liquid line shutoff valve, refrigerant filter-drier, sight glass with moisture indicator, liquid line solenoid valve, thermal expansion valve, and insulated suction line. The factory specialties, along with piping and insulation furnished by the installing contractor shall be field installed by the contractor.

F. Construction: Unit casing and all structural members and rails shall be fabricated of continuous G90 galvanized steel and painted to meet ASTM B117, 500-hour salt spray test.

G. Control System: A centrally located weatherproof control panel shall contain the field power connection points, control interlock terminals, and control system. Power and starting components shall include factory fusing of fan motors and control circuit; individual contactors for each fan motor, solid-state three-phase motor overload protection, inherent fan motor overload protection and unit power terminal blocks for connection to remote disconnect switch. Terminals shall also be provided for power supply to the evaporator heater circuit. Hinged access doors shall be lockable. Barrier panels are required to protect against accidental contact with line voltage when accessing the control system. The operating and equipment protection controls shall be:

H. An advanced DDC microprocessor unit controller with a 4-line by 20-character liquid crystal display provides the operating and protection functions. The controller shall take pre-emptive limiting action in case of high discharge pressure or low evaporator pressure.

The controller shall contain the following features as a minimum:

<u>Equipment Protection</u>

The unit shall be protected in two ways: (1) by alarms that shut the unit down and require manual reset to restore unit operation and (2) by limit alarms that reduce unit operation in response to some out-of-limit condition. Shut down alarms shall activate an alarm signal.

Shutdown Alarms

No evaporator water flow	Sensor failures
Low evaporator pressure	Evaporator freeze protection
High condenser pressure	Outside ambient temperature
Motor protection system	Phase voltage protection (Optional)

Limit Alarms

- Condenser pressure stage down, unloads unit at high discharge pressures
- Low ambient lockout, shuts off unit at low ambient temperatures
- Low evaporator pressure hold, holds stage #1 until pressure rises
- Low evaporator pressure unload, shuts off one compressor

Unit Enable Selection

Enables unit operation from either local keypad, digital input, or BAS

Unit Mode Selection

Selects standard cooling, ice, glycol, or test operation mode

Analog Inputs

Reset of leaving water temperature, 4-20 mA

Digital Inputs

Unit off switch	Motor protection
Remote start/stop	Flow switch

Ice mode switch, converts operation and setpoints for ice production

Digital Outputs

- Shutdown alarm; field wired, activates on an alarm condition, off when alarm is cleared
- Evaporator pump; field wired, starts pump when unit is set to start

Condenser fan control

The unit controller shall provide control of condenser fans based on compressor discharge pressure.

Building Automation System (BAS) Interface

Factory mounted DDC controller(s) shall support operation on a BACnet®, Modbus® or LONMARK ® network via one of the data link / physical layers listed below as specified by the successful Building Automation System (BAS) supplier.

BACnet MS/TP master (Clause 9)

BACnet IP, (Annex J)

BACnet ISO 8802-3, (Ethernet)

LONMARK FTT-10A. The unit controller shall be LONMARK ® certified.

The information communicated between the BAS and the factory mounted unit controllers shall include the reading and writing of data to allow unit monitoring, control and alarm notification as specified in the unit sequence of operation and the unit points list.

For chillers communicating over a LONMARK network, the corresponding LONMARK eXternal Interface File (XIF) shall be provided with the chiller submittal data.

All communication from the chiller unit controller as specified in the points list shall be via standard BACnet objects. Proprietary BACnet objects shall not be allowed. BACnet communications shall conform to the BACnet protocol (ANSI/ASHRAE135-2001). A BACnet Protocol Implementation Conformance Statement (PICS) shall be provided along with the unit submittal.

G. The unit base and coil supports shall be fabricated from heavy gauge steel and painted with powder coat paint. Incidental supports can be galvanized.

2.05 OPTIONS AND ACCESSORIES

The following options are to be included:

- Hot gas bypass, field piped, on all circuits
- Low ambient, variable speed, head pressure control to -10° F (-23° C)
- Copper fin condenser coils
- Coils with aluminum fin stock pre-coated with a corrosion resistant epoxy coating
- Aluminum coils with *ElectroFin*™ (*ElectroFin* is a trademark of Applied Surface Technology Inc.) baked epoxy coating for additional protection. This coating system shall provide 5000+ hour salt spray resistance (ASTM B117-90) and be applied to both the coil and the coil frame.
- Aluminum fin stock pre-coated with a phenolic epoxy coating and with a 1000 hour salt spray resistance (ASTM B117-90).
- Wire mesh guards for lower portion of the unit
- Chilled water flow switch to be field mounted in the chilled water line and field wired to terminals in the control panel
- Spring vibration isolators for field installation
- Factory installed non-fused disconnect switch, with through-the-door handle, mounted in the unit control panel
- Factory installed circuit breaker to provide unit short circuit protection
- Phase loss with under/over voltage protection and with LED indication of the fault type.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in strict accordance with manufacturer's requirements, shop drawings, and contract documents.

B. Adjust and level chiller in alignment on supports.

C. Coordinate electrical installation with electrical contractor.

D Coordinate controls with control contractor.

E. Provide all appurtenances required to provide a fully operational and functional chiller.

3.02 START-UP

A. Provide proper charge of refrigerant and oil.

B. Provide testing, and starting of machine, and instruct the Owner in its proper operation and maintenance.

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.** All McQuay equipment is sold pursuant to McQuay's Standard Terms and Conditions of Sale and Limited Product Warranty.