TRANE®

Product Catalog

Air-Cooled Scroll Chillers

Model CGAM - Made in USA

20—120 Nominal Tons (50 Hz and 60Hz)

November 2009

CG-PRC017-EN

Introduction

Design and manufacturing excellence makes Trane a leader in the air-cooled chiller market place. This tradition of using excellence to meet market demands is illustrated with the new Trane 20-120 ton nominal air-cooled chiller. The introduction of this next-generation chiller is an exciting step forward in energy-efficiency, sound, reliability, ease of serviceability, control precision, application versatility, and operational cost-effectiveness. The new chiller is designed to deliver proven Trane performance based on the redesign of a European model that has been a market leader, plus all the benefits of new heat transfer and fan designs, as well as, low-speed, direct-drive scroll compressors.

Important Design Advances and New Features

- Higher full-load and part-load energy efficiency that exceeds ASHRAE 90.1 and reduces operating costs.
- Significantly lower noise levels than other scroll compressor chillers.
- HFC-410A optimized design.
- Flow switch and water strainer are factory installed in the optimum locations for seamless operation and reduced chiller installation and maintenance time.
- Trane CH530™ with Adaptive Controls™ have improved fan algorithms for more reliable operation at extreme conditions.
- Single chiller time of day scheduling communication for easier control of small jobs.
- Easily integrated with existing BAS via BACnet™ or LonTalk™ communication interface.
- All major service components are close to the unit edge for safe and easy maintenance.
- The chiller is designed for easy serviceability with input from our extended experience in design, testing and field operation.

Table of Contents

Features and Benefits

Reliability

- Years of laboratory testing, including running the chiller at extreme operating conditions, have resulted in optimized compressor and chiller systems reliability by confirming a robust design and verifying quality each step of the way.
- Direct-drive, low-speed scroll compressors with fewer moving parts provide maximum efficiency, high reliability, and low maintenance requirements. Suction gas-cooled motor stays at a uniformly low temperature for long motor life.
- The third generation microprocessor control system provides improved control capabilities with Adaptive Control™ to keep the unit operating even in adverse conditions. Advanced microelectronics protect both the compressor and the motor from typical electrical fault conditions like thermal overload and phase rotation.
- Standard factory-installed water strainer helps prevent system debris from affecting unit flow or heat transfer.
- Flow switch is factory-installed at the optimum location in the piping for reduced chiller installation cost and superior flow sensing, reducing the potential for nuisance trips.
- Exceptionally rigid condenser coil structure is manufactured with hairpin tubes which halves the number of braze joints significantly reducing the potential for leaks.
- Innovative condenser pressure integrated fan control algorithms and variable frequency drive on circuits' lead fans provides more reliable operation at extreme temperature conditions.

Life Cycle Cost-Effectiveness

- Industry leading full- and part-load efficiency
- Electronic expansion valve and high speed suction temperature sensor enables tight chilled water temperature control and low superheat, resulting in more efficient full-load and part-load operation than previously available.
- Partial heat recovery available to save energy on pre-heat or reheat applications.

Application Versatility

- Industrial/low temperature process cooling - Excellent operating temperature range and precise control capabilities enable tight control.
- Ice/thermal storage - Utilities and owners benefit from reduced cooling energy cost. The chiller's dual setpoint control and industry leading ice energy storage efficiency assures reliable operation and superior system efficiency Trane's partnership with CALMAC, brings a proven track record of successful installations across many markets; from churches and schools to sky scrapers and office buildings.
- Partial heat recovery - An optional factory-installed heat exchanger provides hot water for many needs; water preheat and reheat for enhanced system humidity control are just two. This option reduces operating costs associated with boilers/domestic hot water.

Simple, Economical Installation

- Standard sound levels are roughly 5-8 dBa less than the previous Trane air-cooled models, perfect for applying outdoor HVAC equipment in neighborhoods, such as K-12 schools.
- System integration available with LonTalk or BACnet through a single twisted-pair wire for a less expensive translation to an existing building automation system.
- Powder-coated paint provides superior durability, corrosion protection, and is less likely to be damaged while rigging/lifting/installing the chiller.
- Single point or dual point power connection options provide installation flexibility to meet specific application requirements.
- Factory commissioned unit-mounted starter reduces overall job cost and improves system reliability by eliminating job site design, installation and labor coordination requirements.

Precision Control

- Microprocessor-based Trane CH530 controls monitor and maintain optimal operation of the chiller and its associated sensors, actuators, relays, and switches, all of which are factory-installed, powered up and tested prior to shipping.
- Adaptive Control maintains chiller operation under adverse conditions, when many other chillers might simply shut down. Operating conditions that are compensated for include high condensing pressure and low suction pressure.
- Advanced microprocessor controls enable variable primary flow applications providing chilled water temperature control accuracy of ±2°F (1.1°C) for flow changes up to 10 percent per minute, plus handling of flow changes up to 30 percent per minute with continuous operation.
- Easy-to-use operator interface displays all operating and safety messages, with complete diagnostics information, on a highly readable panel with a scrolling touch-screen display. Status and diagnostic messages are in plain language - no codes to interpret - and are available in 20 languages.

Improved Serviceability

- All major serviceable components are close to the edge. Service shutoff valves and water strainer are conveniently located to enable easy service.
- Water piping connections are factory piped to the edge of the unit to make installation safer and faster.
- Electronic expansion valve designed so controls can be removed and serviced without refrigerant handling.
- High pressure transducer and temperature sensors mountings enable troubleshooting and replacement without removing refrigerant charge, greatly improving serviceability over the life of the unit.
- Dead front panel construction provides for enhanced service technician safety.

Application Considerations

Certain application constraints should be considered when sizing, selecting and installing Trane CGAM chillers. Unit and system reliability is often dependent upon proper and complete compliance with these considerations. Where the application varies from the guidelines presented, it should be reviewed with your local Trane account manager.

Note: *The terms water and solution are used interchangeably in the following paragraphs.*

Unit Sizing

Unit capacities are listed in the Performance Data section. Intentionally over-sizing a unit to assure adequate capacity is not recommended. Erratic system operation and excessive compressor cycling are often a direct result of an oversized chiller. In addition, an oversized unit is usually more expensive to purchase, install, and operate. If over sizing is desired consider using two smaller units.

Water Treatment

The use of untreated or improperly treated water in chillers may result in scaling, erosion, corrosion, and algae or slime buildup. This will adversely affect heat transfer between the water and system components. Proper water treatment must be determined locally and depends on the type of system and local water characteristics.

Neither salt nor brackish water is recommend for use in Trane air-cooled CGAM chillers. Use of either will lead to a shortened life. Trane encourages the employment of a qualified water treatment specialist, familiar with local water conditions, to assist in the establishment of a proper water treatment program.

Foreign matter in the chilled water system can also increase pressure drop and, consequently, reduce water flow. For this reason it is important to thoroughly flush all water piping to the unit before making the final piping connections to the unit.

The capacities give in the Performance Data section of this catalog are based on water with a fouling factor of 0.0001°F·ft²·h/Btu (in accordance with AHRI 550/590). For capacities at other fouling factors, see Performance Selection Software.

Effect of Altitude on Capacity

Chiller capacities given in the Performance Data section are based upon application at sea level. At elevations substantially above sea level, the decreased air density will decrease condenser capacity and, therefore, unit capacity and efficiency.

Ambient Limitations

Trane chillers are designed for year-round operation over a range of ambient temperatures. The air-cooled model CGAM chiller will operate in ambient temperatures of 0 to 125°F (-18 to 52°C).

The minimum ambient temperatures are based on still conditions (winds not exceeding five mph). Greater wind velocities will result in a drop in head pressure, therefore increasing the minimum starting and operating ambient temperature. The Adaptive Control™ microprocessor will attempt to keep the chiller on-line when high or low ambient conditions exist, making every effort to avoid nuisance trip-outs and provide the maximum allowable tonnage.

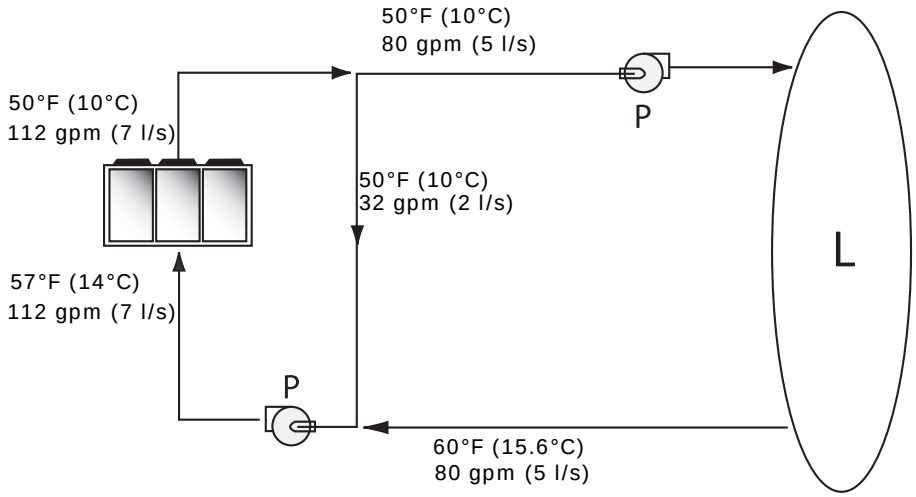
Water Flow Limits

The minimum water flow rates are given in the General Data section of this catalog. Evaporator flow rates below the tabulated values will result in laminar flow causing freeze-up problems, scaling, stratification and poor control. The maximum evaporator water flow rate is also given. Flow rates exceeding those listed may result in very high pressure drop across the evaporator.

Flow Rates Out of Range

Many process cooling jobs require flow rates that cannot be met with the minimum and maximum published values within the CGAM evaporator. A simple piping change can alleviate this problem. For example: a plastic injection molding process requires 80 gpm (5.0 l/s) of 50°F (10°C) water and returns that water at 60°F (15.6°C). The selected chiller can operate at these temperatures, but has a minimum flow rate of 106 gpm (6.6 l/s). The system layout in Figure 1 can satisfy the process.

Figure 1. Flow Rate Out of Range Systems Solution



Flow Proving

Trane provides a factory-installed water flow switch monitored by CH530 which protects the chiller from operating in loss of flow conditions.

Variable Flow in the Evaporator

An attractive chilled water system option may be a Variable Primary Flow (VPF) system. VPF systems present building owners with several cost-saving benefits when compared with Primary/Secondary chilled water systems. The most obvious cost savings results from eliminating the constant volume chiller pump(s), which in turn eliminates the related expenses of the associated piping connections (material, labor), and electrical service and switch gear. In addition to the installed cost advantage building owners often cite pump related energy savings as the reasons that prompted them to select a VPF system.

The CGAM has the capability to handle variable evaporator flow without losing leaving water temperature control. The microprocessor and capacity control algorithms are designed to take a 10 percent change in water flow rate per minute while maintaining a ±2°F (1.1°C) leaving water temperature control accuracy. The chiller tolerates up to 30 percent per minute water flow variation as long as the flow is equal or above the minimum flow rate requirement.

With the help of a software analysis tool such as System Analyzer™, DOE-2 or TRACE™, you can determine whether the anticipated energy savings justify the use of variable primary flow in a particular application. Existing constant flow chilled water systems may be relatively easily converted to VPF and benefit greatly from the inherent efficiency advantages.

Water Temperature

Leaving Water Temperature Limits

Trane CGAM chillers have three distinct leaving water categories:

- standard, with a leaving solution range of 42 to 65°F (5.5 to 18°C)
- low temperature process cooling, with leaving solution range of 10 to 65°F (-12 to 18°C)
- ice-making, with leaving solution range of 20 to 65°F (-7 to 18°C)

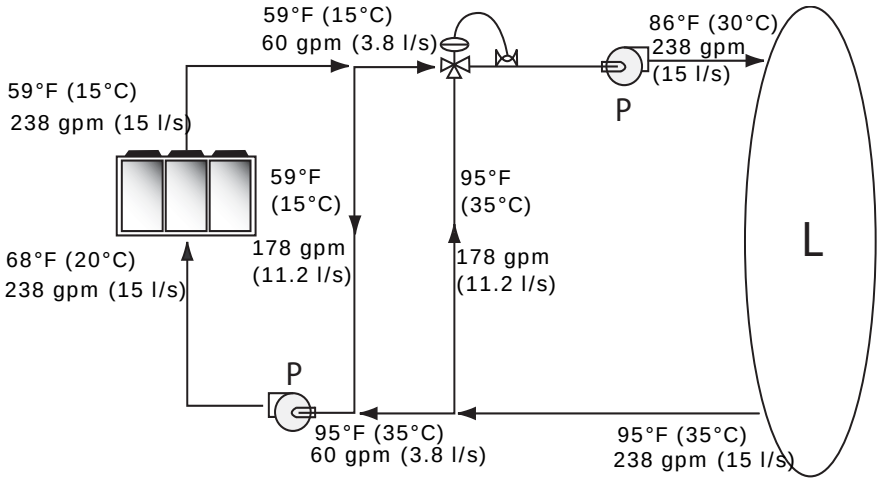
Since leaving solution temperature below 42°F (5.5°C) results in suction temperature at or below the freezing point of water, a glycol solution is required for all low temperature and ice-making machines. Ice making control includes dual setpoint controls and safeties for ice making and standard cooling capabilities. Consult your local Trane account manager for applications or selections involving low temperature or ice making machines.

The maximum water temperature that can be circulated through the CGAM evaporator when the unit is not operating is 125°F (51.7°C). Evaporator damage may result above this temperature.

Leaving Water Temperature Out of Range

Similar to the flow rate limitations above, many process cooling jobs require temperature ranges that are outside the allowable minimum and maximum operating values for the chiller. Figure 2 below shows a simple example of a mixed water piping arrangement change that can permit reliable chiller operation while meeting such cooling conditions. For example, a laboratory load requires 238 gpm (5 l/s) of water entering the process at 86°F (30°C) and returning at 95°F (35°C). The chiller's maximum leaving chilled water temperature of 65°F (15.6°C) prevents direct supply to the load. In the example shown, both the chiller and process flow rates are equal, however, this is not necessary. For example, if the chiller had a higher flow rate, there would simply be more water bypassing and mixing with warm water returning to the chiller.

Figure 2. Temperature Out of Range System Solution



Supply Water Temperature Drop

The cataloged performance data for the Trane CGAM chiller is based on a chilled water temperature drop of 10°F (6°C) for I-P data and 9°F (5°C) for SI data. Full load chilled water temperature drops from 6 to 18°F (3.3 to 10°C) may be used as long as minimum and maximum water temperature and minimum and maximum flow rates are not violated. Temperature drops outside this range at full load conditions are beyond the optimum range for control and may adversely affect the microcomputer's ability to maintain an acceptable supply water temperature range. Furthermore, full load temperature drops of less than 6°F (3.3°C) may result in inadequate refrigerant superheat which is critical to long term efficient and reliable operation. Sufficient superheat is always a primary concern in any refrigerant system and is especially important in a packaged chiller where the evaporator is closely coupled to the compressor.

Typical Water Piping

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

Avoidance of Short Water Loops

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

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

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

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

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

Minimum water volume for a process application

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

Multiple Unit Operation

Whenever two or more units are used on one chilled water loop, Trane recommends that their operation be coordinated with a higher level system controller for best system efficiency and reliability. The Trane Tracer system has advanced chilled plant control capabilities designed to provide such operation.

Ice Storage Operation

An ice storage system uses the chiller to make ice at night when utilities generate electricity more efficiently and charge less for electricity with lower demand and energy charges. The stored ice reduces or even replaces mechanical cooling during the day when utility rates are at their highest. This reduced need for cooling results in significant utility cost savings and source energy savings.

Another advantage of an ice storage system is its ability to eliminate chiller over sizing. A "rightsized" chiller plant with ice storage operates more efficiently with smaller support equipment while lowering the connected load and reducing operating costs. Best of all this system still provides a capacity safety factor and redundancy by building it into the ice storage capacity for practically no cost compared to over sized systems.

The Trane air-cooled chiller is uniquely suited to low temperature applications like ice storage because of the ambient relief experienced at night. Chiller ice making efficiencies are typically similar to or even better than standard cooling daytime efficiencies as a result of night-time dry-bulb ambient relief.

Standard smart control strategies for ice storage systems are another advantage of the CGAM chiller. The dual mode control functionality are integrated right into the chiller. Trane Tracer building management systems can measure demand and receive pricing signals from the utility and decide when to use the stored cooling and when to use the chiller.

Partial Heat Recovery Operation

Partial heat recovery is designed to salvage a portion of the heat that is normally rejected to the atmosphere through the air-cooled condenser coil and put it to beneficial use. With the addition of a heat recovery cycle, heat removed from the building cooling load can be transferred to a preheat application. Keep in mind that the heat recovery cycle is only possible if a cooling load exists to act as a heat source.

To provide a heat recovery cycle, a supplemental heat exchanger is mounted in series to the air-cooled condenser. The supplemental heat exchanger is piped into a preheat circuit. During the heat recovery cycle, the unit operates just as it does in the cooling-only mode except that a portion of the cooling load heat is rejected to the water heating circuit rather than to the air through the air-cooled condenser. Water circulated through the heat recovery heat exchanger by the pumps absorbs cooling load heat from the compressed refrigerant gas discharged by the compressors. The heated water is then used to satisfy heating requirements.

Partial heat recovery can be used in applications where hot water is needed for use in kitchens, lavatories, etc. It is comparatively smaller in size and its heating capacity is not controlled. The partial heat recovery heat exchanger cannot operate alone without a load on the chiller.

The partial heat recovery heat exchanger can get up to 157°F (69.4°C) leaving temperature. For more information see the Performance Selection Program.

Unit Placement

Setting The Unit

A base or foundation is not required if the selected unit location is level and strong enough to support the unit's operating weight (see "Weights" section of this catalog).

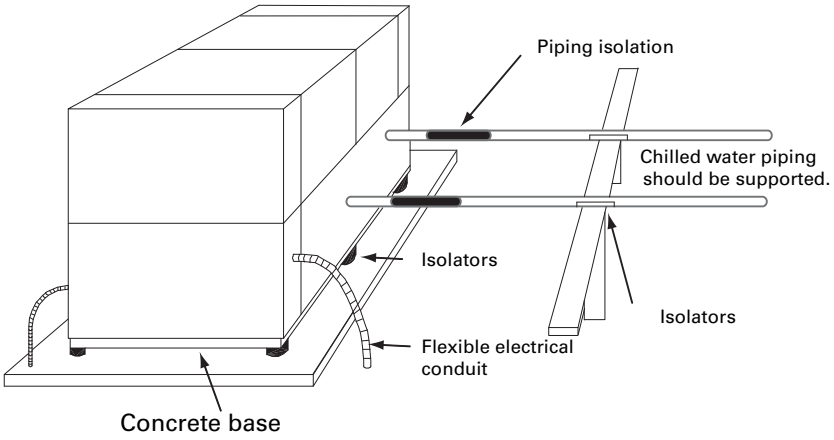
For a detailed discussion of base and foundation construction, refer to the sound engineering bulletin or the unit IOM. Manuals are available through the local Trane office.

HVAC equipment must be located to minimize sound and vibration transmission to the occupied spaces of the building structure it serves. If the equipment must be located in close proximity to a building, it should be placed next to an unoccupied space such as a storage room, mechanical room, etc. It is not recommended to locate the equipment near occupied, sound sensitive areas of the building or near windows. Locating the equipment away from structures will also prevent sound reflection, which can increase sound levels at property lines or other sensitive points.

Isolation and Sound Emission

Structurally transmitted sound can be reduced by elastomeric vibration eliminators. Elastomeric isolators are generally effective in reducing vibratory noise generated by compressors, and therefore, are recommended for sound sensitive installations. An acoustical engineer should always be consulted on critical applications.

Figure 3. Installation Example



For maximum isolation effect, water lines and electrical conduit should also be isolated. Wall sleeves and rubber isolated piping hangers can be used to reduce the sound transmitted through water piping. To reduce the sound transmitted through electrical conduit, use flexible electrical conduit.

Local codes on sound emissions should always be considered. Since the environment in which a sound source is located affects sound pressure, unit placement must be carefully evaluated. Sound power levels for chillers are available on request.

Servicing

Adequate clearance for evaporator and compressor servicing should be provided. Recommended minimum space envelopes for servicing are located in the dimensional data section and can serve as a guideline for providing adequate clearance. The minimum space envelopes also allow for control panel door swing and routine maintenance requirements. Local code requirements may take precedence.

Unit Location

General

Unobstructed flow of condenser air is essential to maintain chiller capacity and operating efficiency. When determining unit placement, careful consideration must be given to assure a sufficient flow of air across the condenser heat transfer surface. Two detrimental conditions are possible and must be avoided: warm air recirculation and coil starvation. Air recirculation occurs when discharge air from the condenser fans is recycled back to the condenser coil inlet. Coil starvation occurs when free airflow to the condenser is restricted.

Condenser coils and fan discharge must be kept free of snow or other obstructions to permit adequate airflow for satisfactory unit operation. Debris, trash, supplies, etc., should not be allowed to accumulate in the vicinity of the air-cooled chiller. Supply air movement may draw debris into the condenser coil, blocking spaces between coil fins and causing coil starvation.

Both warm air recirculation and coil starvation cause reductions in unit efficiency and capacity because of the higher head pressures associated with them. The air-cooled CGAM chiller offers an advantage over competitive equipment in these situations. Operation is minimally affected in many restricted air flow situations due to its advanced Adaptive Control™ microprocessor which has the ability to understand the operating environment of the chiller and adapt to it by first optimizing its performance and then staying on line through abnormal conditions. For example, high ambient temperatures combined with a restricted air flow situation will generally not cause the air-cooled model CGAM chiller to shut down. Other chillers would typically shut down on a high pressure nuisance cut-out in these conditions.

Cross winds, those perpendicular to the condenser, tend to aid efficient operation in warmer ambient conditions. However, they tend to be detrimental to operation in lower ambients due to the accompanying loss of adequate head pressure. Special consideration should be given to low ambient units. As a result, it is advisable to protect air-cooled chillers from continuous direct winds exceeding 10 mph (4.5 m/s) in low ambient conditions.

The recommended lateral clearances are depicted in the close spacing engineering bulletin available from your local office.

Provide Sufficient Unit-to-Unit Clearance

Units should be separated from each other by sufficient distance to prevent warm air recirculation or coil starvation. Doubling the recommended single unit air-cooled chiller clearances will generally prove to be adequate.

Walled Enclosure Installations

When the unit is placed in an enclosure or small depression, the top of the surrounding walls should be no higher than the top of the fans. The chiller should be completely open above the fan deck. There should be no roof or structure covering the top of the chiller. Ducting individual fans is not recommended.

Model Number Descriptions

Digit 1-4 — Chiller Model

CGAM = Air-Cooled Scroll Packaged Chiller

Digit 5-7 — Unit Nominal Tonnage

020 = 20 Tons
026 = 26 Tons
030 = 30 Tons
035 = 35 Tons
040 = 40 Tons
052 = 52 Tons
060 = 60 Tons
070 = 70 Tons
080 = 80 Tons
090 = 90 Tons
100 = 100 Tons
110 = 110 Tons
120 = 120 Tons

Digit 8 — Unit Voltage

A = 200 Volt 60 Hz 3 Phase
B = 230 Volt 60 Hz 3 Phase
D = 380 Volt 60 Hz 3 Phase
E = 400 Volt 50 Hz 3 Phase
F = 460 Volt 60 Hz 3 Phase
G = 575 Volt 60 Hz 3 Phase

Digit 9 — Manufacturing Plant

2 = Pueblo, USA

Digit 10-11 — Design Sequence

A-Z = Factory/ABU Assigned

Digit 12 — Unit Type

2 = High Efficiency/Performance

Digit 13 — Agency Listing

X = No Agency Listing
A = UL Listed to US and Canadian Safety Standard

Digit 14 — Pressure Vessel Code

X = No Pressure Vessel Code

Digit 15 — Unit Application

D = Wide Ambient (0 to 125F/-18 to 52C)

Digit 16 — Refrigerant Isolation Valves

2 = Refrigerant Isolation Valves (Discharge Valve)

Digit 17 — Seismically Rated Unit

A = Not Seismically Rated Unit
B = Seismically Rated Unit

Digit 18 — Freeze Protection (Factory-Installed Only)

1 = With Freeze Protection (External T-Stat Control)

Digit 19 — Insulation

A = Factory Insulation - All Cold Parts
B = Insulation for High Humidity/ Low Evap Temp

Digit 20 — Factory Charge

1 = Full Factory Refrigerant Charge (HFC-410A)
2 = Nitrogen Charge

Digit 21 — Evaporator Application

A = Standard Cooling (42 to 65°F/5.5 to 18°C)
B = Low Temperature Processing (lower than 42°F/5.5°C)
C = Ice-Making - hardwired interface (20 to 65°F/-7 to 18°C)

Digit 22 — Water Connection (Evap)

1 = Grooved Pipe Connection

Digit 23 — Condenser Fin Material

A = Lanced Aluminum Fins
D = Lanced Aluminum Fins w/ CompleteCoat™

Digit 24 — Condenser Heat Recovery

X = No Heat Recovery
1 = Partial Heat Recovery w/ Fan Control

Digit 25

X

Digit 26 — Starter Type

A = Across the Line Starter/ Direct on Line

Digit 27 — Incoming Power Line Connection

1 = Single Point Power Connection
2 = Dual Point Power Connection

Digit 28 — Power Line Connection Type

A = Terminal Block Conn. For Incoming Lines
C = Circuit Breaker
D = Circuit Breaker with High Fault Rated Control Panel

Digit 29 — Enclosure Type

1 = Water Tight (Per UL 1995 Standard)

Digit 30 — Unit Operator Interface

A = Dyna-View/English
C = Dyna-View/Spanish-Mexico
D = Dyna-View/French
K = Dyna-View/Portuguese-Brazil
M = Dyna-View/Thai
N = Dyna-View/Simplified Chinese
P = Dyna-View/Traditional Chinese

Digit 31 — Remote Interface (digital comm)

X = No Remote Digital Communication
2 = LonTalk/Tracer Summit Interface
3 = Time of Day Scheduling
4 = BACNet Interface

Digit 32 — Ext. Chilled/Hot Water and Curr. Demand Limit Setpoint

X = No Ext. Chilled Water Setpoint
A = Ext Chilled Water and Demand Limit Setpoint - 4-20mA
B = Ext Chilled Water and Demand Limit Setpoint - 2-10Vdc

Digit 33 —% Capacity

X = Without % Capacity
1 = With % Capacity

Digit 34 — Programmable Relays

X = No Programmable Relays
A = Programmable Relays

Digit 35 —

X =

Digit 36 —

X =

Digit 37 —

X =

Digit 38 — Short Circuit Rating

A = Default A Short Circuit Rating
B = High A Short Circuit Rating

Digit 39 — Installation Accessories

X = No Installation Accessories
1 = Elastomeric Isolators

Digit 40 — Water Strainer

A = With Water Strainer Factory-Installed

Digit 41 — Sound Attenuator Package

3 = Super Quiet
5 = Comprehensive Acoustic Package

Digit 42 — Appearance Options

X = No Appearance Options
A = Architectural Louvered Panels
B = Half Louvers

Digit 43 — Exterior Finish

1 = Standard Paint

Digit 44 — Label and Literature Language

B = Spanish
D = English
E = French and English
V = Portuguese

Digit 45

X

Digit 46 — Shipping Package

X = No Skid (Standard)
A = Unit Containerization Package

Digit 47 — Performance Test Options

X = No Performance Test
2 = 1 Point Test with Report
3 = Witness 1 Point Test with Report

Digit 48

X

Digit 49

X

Digit 50 — Specials

X = None
S = Special

Notes:

1. If a digit is not defined it may be held for future use.

General Data

Table 1. General Data - 60 Hz - IP

Size		20	26	30	35	40	52	60	70	80	90	100	110	120
Compressor														
Number	#	2	2	2	2	4	4	4	4	4	4	4	4	4
Tonnage/circuit[1]		10+10	13+13	15+15	15+20	10+10	13+13	15+15	15+20	20+20	20+25	25+25	25+30	30+30
Evaporator														
Water storage	(gal)	1.4	2.2	2.2	3.2	2.4	4.1	5.0	7.5	7.0	9.0	10.3	11.5	11.5
Min. flow[2]	(gpm)	24	30	34	40	46	59	68	80	92	103	116	126	136
Max. flow[2]	(gpm)	69	89	100	117	136	176	201	238	275	307	346	375	407
Water connection	(in)	2	2.5	2.5	2.5	3	3	3	3	4	4	4	4	4
Condenser														
Quantity of coils	#	1	1	1	1	2	2	2	2	4	4	4	4	4
Coil length	(in)	91	91	127	127	91	91	127	127	121	121	144	144	144
Coil height	(in)	68	68	68	68	68	68	68	68	42	42	42	42	42
Number of rows	#	2	2	2	2	2	2	2	2	3	3	3	3	3
Fins per foot	(fpf)	192	192	192	192	192	192	192	192	192	192	192	192	192
Fan														
Quantity	#	2	2	3	3	4	4	6	6	6	6	8	8	8
Diameter	(in)	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
Airflow per fan	(cfm)	9413	9420	9168	9173	9413	9420	9168	9173	9470	9472	9094	9096	9098
Power per motor	(kW)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Motor RPM	(rpm)	840	840	840	840	840	840	840	840	840	840	840	840	840
Tip speed	(ft/ min)	6333	6333	6333	6333	6333	6333	6333	6333	6333	6333	6333	6333	6333
General Unit														
Refrig circuits	#	1	1	1	1	2	2	2	2	2	2	2	2	2
Capacity steps	%	50-100	50-100	50-100	43-100	25-50-75-100	25-50-75-100	25-50-75-100	21-43-71-100	25-50-75-100	22-44-72-100	25-50-75-100	23-45-73-100	25-50-75-100
Refrig charge/ circuit [1]	(lbs)	34	34	48	48	32	32	48	48	74	74	82	86	86
Oil charge/circuit[1]	(gal)	1.7	1.7	3.5	3.5	1.7	1.7	3.5	3.5	3.5	3.5	3.5	3.7	3.8
Min ambient														
Wide ambient	(°F)	0	0	0	0	0	0	0	0	0	0	0	0	0

1. Data shown for circuit one only. The second circuits always matches.
2. Flow limits are for water only.

General Data

Table 2. General Data - 60 Hz - SI

Size		20	26	30	35	40	52	60	70	80	90	100	110	120
Compressor														
Number	#	2	2	2	2	4	4	4	4	4	4	4	4	4
Tonnage/circuit[1]		10+10	13+13	15+15	15+20	10+10	13+13	15+15	15+20	20+20	20+25	25+25	25+30	30+30
Evaporator														
Water storage	(l)	5.3	8.3	8.3	12.1	9.1	15.5	18.9	28.4	26.5	34.1	39.0	43.5	43.5
Min. flow[2]	(l/s)	1.5	1.9	2.1	2.5	2.9	3.7	4.2	5.0	5.8	6.5	7.3	7.9	8.6
Max. flow[2]	(l/s)	4.4	5.6	6.3	7.4	8.6	11.1	12.7	15.1	17.4	19.4	21.9	23.7	25.7
Water connection	(mm)	50.8	63.5	63.5	63.5	76.2	76.2	76.2	76.2	101.6	101.6	101.6	101.6	101.6
Condenser														
Qty of coils	#	1	1	1	1	2	2	2	2	4	4	4	4	4
Coil length	(mm)	2311	2311	3226	3226	2311	2311	3226	3226	3073	3073	3658	3658	3658
Coil height	(mm)	1727	1727	1727	1727	1727	1727	1727	1727	1067	1067	1067	1067	1067
Number of rows	#	2	2	2	2	2	2	2	2	3	3	3	3	3
Fins per foot	(fpf)	192	192	192	192	192	192	192	192	192	192	192	192	192
Fan														
Quantity/circuit[1]	#	2	2	3	3	2	2	3	3	2	3	4	4	4
Diameter	(mm)	732	732	732	732	732	732	732	732	732	732	732	732	732
Airflow per fan	(m^3/h)	15993	16005	15577	15585	15993	16005	15577	15585	16090	16093	15451	15454	15458
Power per motor	(kW)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Motor RPM	(rpm)	840	840	840	840	840	840	840	840	840	840	840	840	840
Tip speed	(m/s)	32	32	32	32	32	32	32	32	32	32	32	32	32
General Unit														
Refrig circuits	#	1	1	1	1	2	2	2	2	2	2	2	2	2
Capacity steps	%	50-100	50-100	50-100	43-100	25-50-75-100	25-50-75-100	25-50-75-100	21-43-71-100	25-50-75-100	22-44-72-100	25-50-75-100	23-45-73-100	25-50-75-100
Refrig charge/circuit[1]	(kg)	15.4	15.4	21.8	21.8	14.5	14.5	21.8	21.8	33.6	33.6	37.2	39.0	39.0
Oil charge /circuit[1]	(l)	6.4	6.4	13.2	13.2	6.4	6.4	13.2	13.2	13.2	13.2	13.2	14	14.4
Min ambient														
Wide ambient	(°C)	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18

1. Data shown for circuit one only. The second circuit always matches.
2. Flow limits are for water only.

Table 3. General Data - 50 Hz - IP

Size		20	26	30	35	40	52	60	70	80	90	100	110	120
Compressor														
Number	#	2	2	2	2	4	4	4	4	4	4	4	4	4
Tonnage/circuit[1]		10+10	13+13	15+15	15+20	10+10	13+13	15+15	15+20	20+20	20+25	25+25	25+30	30+30
Evaporator														
Water storage	(gal)	1.4	2.2	2.2	3.2	2.4	4.1	5.0	7.5	7.0	9.0	10.3	11.5	11.5
Min. flow[2]	(gpm)	20	26	29	33	39	50	57	67	79	88	99	107	114
Max. flow[2]	(gpm)	59	75	85	98	115	149	170	199	234	262	296	319	341
Water connection	(in)	2	2.5	2.5	2.5	3	3	3	3	4	4	4	4	4
Condenser														
Quantity of coils	#	1	1	1	1	2	2	2	2	4	4	4	4	4
Coil length	(in)	91	91	127	127	91	91	127	127	121	121	144	144	144
Coil height	(in)	68	68	68	68	68	68	68	68	42	42	42	42	42
Number of rows	#	2	2	2	2	2	2	2	2	3	3	3	3	3
Fins per foot	(fpf)	192	192	192	192	192	192	192	192	192	192	192	192	192
Fan														
Quantity	#	2	2	3	3	4	4	6	6	6	6	8	8	8
Diameter	(in)	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
Airflow/fan	(cfm)	7796	7783	7587	7590	7795	7801	7587	7590	7827	7829	7503	7505	7506
Power/motor	(kW)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Motor RPM	(rpm)	700	700	700	700	700	700	700	700	700	700	700	700	700
Tip speed	(ft/min)	5278	5278	5278	5278	5278	5278	5278	5278	5278	5278	5278	5278	5278
General Unit														
Refrig circuits	#	1	1	1	1	2	2	2	2	2	2	2	2	2
Capacity steps	%	50-100	50-100	50-100	43-100	25-50-75-100	25-50-75-100	25-50-75-100	21-43-71-100	25-50-75-100	22-44-72-100	25-50-75-100	23-45-73-100	25-50-75-100
Refrig charge/circuit[1]	(lbs)	34	34	48	48	32	32	48	48	74	74	82	86	84
Oil charge/circuit[1]	(gal)	1.7	1.7	3.5	3.5	1.7	1.7	3.5	3.5	3.5	3.5	3.5	3.7	3.8
Min ambient														
Wide ambient	(°F)	0	0	0	0	0	0	0	0	0	0	0	0	0

1. Data shown for circuit one only. The second circuit always matches.
2. Flow limits are for water only.

General Data

Table 4. General Data - 50 Hz - SI

Size		20	26	30	35	40	52	60	70	80	90	100	110	120
Compressor														
Number	#	2	2	2	2	4	4	4	4	4	4	4	4	4
Tonnage/circuit[1]		10+10	13+13	15+15	15+20	10+10	13+13	15+15	15+20	20+20	20+25	25+25	25+30	30+30
Evaporator														
Water storage	(l)	5.3	8.3	8.3	12.1	9.1	15.5	18.9	28.4	26.5	34.1	39.0	43.5	43.5
Min. flow[2]	(l/s)	1.2	1.6	1.8	2.1	2.4	3.1	3.6	4.2	4.9	5.5	6.2	6.7	7.2
Max. flow[2]	(l/s)	3.7	4.8	5.4	6.2	7.3	9.4	10.8	12.6	14.8	16.5	18.7	20.2	21.6
Water connection	(mm)	50.8	63.5	63.5	63.5	76.2	76.2	76.2	76.2	101.6	101.6	101.6	101.6	101.6
Condenser														
Quantity of coils	#	1	1	1	1	2	2	2	2	4	4	4	4	4
Coil length	(mm)	2311	2311	3226	3226	2311	2311	3226	3226	3073	3073	3658	3658	3658
Coil height	(mm)	1727	1727	1727	1727	1727	1727	1727	1727	1067	1067	1067	1067	1067
Number of rows	#	2	2	2	2	2	2	2	2	3	3	3	3	3
Fins per foot	(fpf)	192	192	192	192	192	192	192	192	192	192	192	192	192
Fan														
Quantity	#	2	2	3	3	4	4	6	6	6	6	8	8	8
Diameter	(mm)	732	732	732	732	732	732	732	732	732	732	732	732	732
Airflow/fan	(m^3/h)	13245	13223	12890	12895	13244	13254	12890	12895	13298	13302	12748	12751	12753
Power/motor	(kW)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Motor RPM	(rpm)	700	700	700	700	700	700	700	700	700	700	700	700	700
Tip speed	(m/s)	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8
General Unit														
Refrig circuits	#	1	1	1	1	2	2	2	2	2	2	2	2	2
Capacity steps	%	50-100	50-100	50-100	43-100	25-50-75-100	25-50-75-100	25-50-75-100	21-43-71-100	25-50-75-100	22-44-72-100	25-50-75-100	23-45-73-100	25-50-75-100
Refrig charge/circuit[1]	(kg)	15.4	15.4	21.8	21.8	14.5	14.5	21.8	21.8	33.6	33.6	37.2	39.0	38.1
Oil charge/circuit [1]	(l)	6.4	6.4	13.2	13.2	6.4	6.4	13.2	13.2	13.2	13.2	13.2	14.0	14.4
Min ambient														
Wide ambient	(°C)	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18

1. Data shown for circuit one only. The second circuit always matches.
2. Flow limits are for water only.

Performance Data

Table 5. Performance Data - 60 Hz - I-P units

Evaporator Leaving Temperature	Unit Size	Condenser Ambient Temperature 85 Tons	85 kW input	85 EER	95 Tons	95 kW input	95 EER	105 Tons	105 kW input	105 EER	115 Tons	115 kW input	115 EER
	20	20.1	18.4	11.4	18.9	20.3	9.9	17.6	22.5	8.4	16.2	24.8	7.1
	26	25.9	24.5	11.5	24.2	27.1	9.8	22.4	29.9	8.3	20.6	33.0	6.9
	30	29.0	26.2	11.5	27.2	29.3	9.8	25.4	32.6	8.3	23.4	36.2	7.0
	35	34.2	32.0	11.4	32.0	35.6	9.7	29.8	39.5	8.2	27.4	43.7	6.9
	40	39.1	36.1	11.3	36.8	39.9	9.8	34.3	44.2	8.3	31.6	48.8	7.0
	52	50.6	48.0	11.4	47.4	53.1	9.8	43.9	58.8	8.3	40.3	64.9	6.9
42	60	58.3	52.0	11.7	54.6	58.0	10.0	50.8	64.5	8.5	46.8	71.5	7.1
	70	68.4	63.2	11.6	64.1	70.1	9.9	59.4	77.7	8.4	54.7	85.8	7.0
	80	77.8	70.5	11.9	73.2	78.6	10.2	68.3	87.6	8.6	63.0	97.3	7.2
	90	87.9	81.2	11.9	82.5	89.9	10.2	76.8	99.5	8.6	70.7	109.7	7.3
	100	98.5	89.0	11.9	92.7	98.4	10.3	86.4	108.7	8.7	79.6	119.7	7.4
	110	107.4	100.6	11.6	100.9	111.0	10.0	93.9	122.3	8.5	86.4	134.5	7.2
	120	117.4	113.2	11.4	110.2	124.7	9.8	102.4	137.3	8.3	94.2	150.7	7.0
	20	20.8	18.6	11.7	19.6	20.5	10.1	18.2	22.7	8.6	16.8	25.0	7.3
	26	26.7	24.8	11.7	25.0	27.4	10.0	23.2	30.2	8.5	21.2	33.3	7.1
	30	30.0	26.5	11.8	28.2	29.6	10.1	26.2	32.9	8.6	24.2	36.4	7.3
	35	35.3	32.4	11.7	33.1	35.9	10.0	30.8	39.8	8.5	28.4	44.0	7.1
	40	40.5	36.5	11.6	38.2	40.4	10.0	65.6	44.6	8.6	32.8	49.2	7.3
	52	52.3	48.6	11.7	49.0	53.7	10.0	45.4	59.3	8.5	41.6	65.4	7.1
44	60	60.3	52.5	12.0	56.6	58.5	10.3	52.6	65.0	8.7	48.6	72.0	7.3
	70	70.8	63.9	11.9	66.3	70.8	10.2	61.5	78.3	8.6	56.6	86.5	7.2
	80	80.5	71.1	12.2	75.8	79.3	10.5	70.6	88.3	8.9	65.2	98.0	7.4
	90	90.9	82.0	12.2	85.4	90.8	10.4	79.4	100.3	8.9	73.1	110.5	7.5
	100	102.0	89.8	12.3	96.0	99.2	10.6	89.4	109.5	9.0	82.7	120.5	7.6
	110	111.1	101.6	11.9	104.4	112.0	10.3	97.1	123.3	8.8	89.4	135.5	7.4
	120	121.4	114.3	11.7	113.9	125.9	10.1	105.8	138.4	8.6	97.4	151.8	7.2
	20	21.5	18.8	12.0	20.2	20.7	10.4	18.8	22.9	8.9	17.4	25.2	7.5
	26	27.6	25.0	12.0	25.8	27.6	10.2	23.9	30.5	8.7	21.9	33.5	7.3
	30	31.1	26.7	12.1	29.2	29.8	10.4	27.1	33.1	8.8	25.1	36.7	7.4
	35	36.5	32.7	12.0	34.2	36.3	10.2	31.8	40.2	8.7	29.3	44.3	7.3
	40	42.0	37.0	11.9	39.5	40.8	10.3	36.8	45.0	8.8	34.0	49.6	7.5
	52	54.1	49.1	12.0	50.6	54.3	10.2	46.9	59.9	8.7	43.0	65.9	7.3
46	60	62.5	53.0	12.3	58.6	59.0	10.5	54.5	65.5	9.0	50.3	72.4	7.6
	70	73.2	64.6	12.2	68.5	71.5	10.4	63.6	79.0	8.8	58.6	87.1	7.4
	80	83.3	71.8	12.6	78.4	80.0	10.7	73.1	89.0	9.1	67.5	98.7	7.6
	90	94.0	82.8	12.5	88.2	91.6	10.7	82.1	101.1	9.1	75.6	111.3	7.7
	100	105.5	90.6	12.6	99.3	100.0	10.8	92.5	110.2	9.2	85.3	121.3	7.8
	110	114.9	102.5	12.2	107.9	112.9	10.5	100.4	124.3	9.0	92.5	136.4	7.6
	120	125.4	115.5	12.0	117.7	127.0	10.3	109.4	139.5	8.8	100.7	152.9	7.4

Table 5. Performance Data - 60 Hz - I-P units

Evaporator Leaving Temperature	Unit Size	Condenser Ambient Temperature 85 Tons	85 kW input	85 EER	95 Tons	95 kW input	95 EER	105 Tons	105 kW input	105 EER	115 Tons	115 kW input	115 EER
48	20	22.2	19.0	12.3	20.9	21.0	10.6	19.4	23.1	9.1	17.9	25.4	7.7
	26	28.4	25.3	12.2	26.6	27.9	10.5	24.7	30.7	8.9	22.6	33.8	7.5
	30	32.1	27.0	12.4	30.1	30.1	10.6	28.1	33.4	9.0	25.9	36.9	7.7
	35	37.7	33.0	12.2	35.3	36.6	10.5	32.9	40.5	8.9	30.3	44.6	7.5
	40	43.5	37.4	12.2	40.9	41.3	10.6	38.1	45.5	9.0	35.2	50.0	7.7
	52	55.8	49.7	12.2	52.2	54.8	10.5	48.4	60.4	8.9	44.4	66.4	7.5
	60	64.6	53.5	12.6	60.6	59.5	10.8	56.4	66.0	9.2	52.1	72.9	7.8
	70	75.6	65.3	12.4	70.8	72.2	10.7	65.7	79.7	9.1	60.6	87.8	7.6
	80	86.1	72.5	12.9	81.0	80.7	11.0	75.5	89.7	9.3	69.7	99.3	7.8
	90	97.1	83.6	12.8	91.1	92.4	11.0	84.8	101.9	9.3	78.1	112.0	7.9
	100	109.0	91.3	12.9	102.6	100.8	11.1	95.6	111.0	9.5	88.2	122.0	8.0
	110	118.7	103.5	12.5	111.5	113.9	10.8	103.7	125.2	9.2	95.6	137.3	7.8
	120	129.5	116.6	12.3	121.5	128.2	10.6	112.9	140.7	9.0	104.0	153.9	7.6
50	20	22.9	19.3	12.6	21.6	21.2	10.9	20.1	23.3	9.3	18.5	25.6	7.9
	26	29.3	25.6	12.5	27.4	28.2	10.7	25.4	31.0	9.1	23.3	34.0	7.7
	30	33.1	27.3	12.7	31.1	30.3	10.9	29.0	33.6	9.3	26.8	37.1	7.9
	35	38.9	33.4	12.5	36.5	37.0	10.7	33.9	40.8	9.1	31.3	45.0	7.7
	40	45.0	37.9	12.5	42.3	41.7	10.8	39.5	45.9	9.3	36.4	50.4	7.9
	52	57.6	50.3	12.5	53.9	55.4	10.7	49.9	61.0	9.1	45.9	66.9	7.7
	60	66.8	54.1	12.9	62.7	60.1	11.1	58.3	66.5	9.4	53.9	73.4	8.0
	70	78.1	66.0	12.7	73.1	72.9	10.9	67.9	80.4	9.3	62.6	88.4	7.8
	80	88.9	73.2	13.2	83.6	81.4	11.3	78.0	90.4	9.6	72.0	100.0	8.0
	90	100.2	84.4	13.1	94.0	93.2	11.2	87.5	102.7	9.5	80.6	112.8	8.1
	100	112.6	92.1	13.2	106.0	101.6	11.4	98.7	111.8	9.7	91.1	122.7	8.3
	110	122.5	104.5	12.8	115.1	114.9	11.1	107.0	126.2	9.4	98.7	138.2	8.0
	120	133.6	117.8	12.5	125.3	129.3	10.8	116.5	141.8	9.2	107.3	155.0	7.8

1. Rated in accordance with AHRI Standard 550/590 based on sea level altitude, evaporator fouling factor of 0.00010°F·ft²h/Btu, evaporator temperature drop of 10°F and 460 voltage.
2. kW input is for compressors only.
3. EER = Energy Efficiency Ratio (Btu/watt-hour). Power inputs include: compressors, condenser fans, and control power.
4. Interpolation between points is permissible. Extrapolation is not permitted.
5. Consult Trane representative for performance at temperatures outside of the ranges shown.

Table 6. Performance Data - 60 Hz - SI units

Evaporator Leaving Temperature	Unit Size	Condenser Ambient Temperature 30 kW cooling	30 kW input	30 COP	35 kW cooling	35 kW input	35 COP	40 kW cooling	40 kW input	40 COP	45 kW cooling	45 kW input	45 COP
	20	73.1	21.5	3.4	69.3	20.6	3.0	65.1	22.5	2.6	60.5	24.5	2.2
	26	93.9	25.1	3.4	88.6	27.4	3.0	82.6	30.0	2.6	76.7	32.7	2.2
	30	105.8	26.8	3.4	99.9	29.6	3.0	93.5	32.6	2.6	87.2	35.7	2.2
	35	124.1	32.8	3.4	117.1	36.0	2.9	109.7	39.5	2.6	102.0	43.2	2.2
	40	142.8	37.0	3.4	135.0	40.5	3.0	126.9	44.3	2.6	118.1	48.4	2.2
	52	184.2	49.2	3.4	173.3	53.8	2.9	162.1	58.9	2.6	150.1	64.3	2.2
7	**60**	212.4	53.1	3.5	200.4	58.6	3.0	187.8	64.4	2.6	174.8	70.7	2.2
	70	248.9	72.3	3.5	234.5	70.9	3.0	219.4	77.7	2.6	203.9	84.9	2.2
	80	283.4	72.1	3.5	268.3	79.4	3.1	252.1	87.5	2.7	234.9	96.1	2.3
	90	320.0	83.0	3.5	302.0	90.9	3.1	283.0	99.5	2.7	263.4	108.6	2.3
	100	359.0	90.8	3.5	339.7	99.3	3.1	318.9	108.5	2.7	296.8	118.4	2.3
	110	391.0	102.7	3.5	369.5	112.2	3.0	346.3	122.3	2.6	322.1	133.2	2.3
	120	427.2	115.7	3.4	402.9	126.1	3.0	377.6	137.3	2.6	350.9	149.3	2.2
	20	77.7	19.2	3.5	73.5	21.0	3.1	68.9	22.9	2.7	64.0	24.9	2.3
	26	99.5	25.6	3.5	93.5	27.9	3.1	87.6	30.4	2.6	80.9	33.2	2.3
	30	112.2	27.3	3.6	105.8	30.1	3.1	99.5	33.0	2.7	92.8	36.2	2.3
	35	131.5	33.4	3.5	124.1	36.6	3.1	116.4	40.1	2.6	108.3	43.8	2.3
	40	151.9	37.8	3.5	143.8	41.3	3.1	135.0	45.0	2.7	125.9	49.1	2.3
	52	195.1	50.2	3.5	183.5	54.8	3.1	171.6	59.8	2.6	159.3	65.2	2.3
9	**60**	225.7	54.1	3.6	213.1	59.5	3.2	199.7	65.3	2.8	186.4	71.5	2.3
	70	264.1	65.9	3.6	248.9	72.2	3.1	232.8	78.9	2.7	216.6	86.1	2.3
	80	301.0	73.3	3.7	284.8	80.7	3.2	267.6	88.7	2.8	249.3	97.4	2.4
	90	339.3	84.4	3.7	320.3	92.4	3.2	300.3	100.9	2.8	279.5	110.0	2.4
	100	381.1	92.2	3.7	360.7	100.8	3.3	338.6	109.9	2.8	315.4	119.7	2.4
	110	414.5	104.5	3.6	391.7	113.9	3.2	367.4	124.0	2.8	341.8	134.8	2.4
	120	452.5	117.7	3.5	427.2	128.2	3.1	400.1	139.4	2.7	372.0	151.2	2.3

1. Rated in accordance with AHRI Standard 550/590, based on sea level altitude, evaporator fouling factor of 0.01761 m^2-°C/kW, evaporator temperature drop of 5°C and 460 voltage.
2. COP = Coefficient of Performance. Power inputs include: compressors, condenser fans, and control power.
3. kW input is for compressors only.
4. Interpolation between points is permissible. Extrapolation is not permitted.
5. Consult Trane representative for performance at temperatures outside of the ranges shown.

Table 7. Performance Data - 50 Hz - I-P units

Evaporator Leaving Temperature	Unit Size	Condenser Ambient Temperature 85 Tons	85 kW input	85 EER	95 Tons	95 kW input	95 EER	105 Tons	105 kW input	105 EER	115 Tons	115 kW input	115 EER
42	20	17.2	14.9	12.4	16.1	16.5	10.6	14.9	18.3	8.9	13.7	20.3	7.5
	26	21.9	19.8	12.2	20.5	22.1	10.3	18.9	24.6	8.7	17.3	27.3	7.2
	30	24.8	22.0	12.1	23.2	24.6	10.3	21.5	27.4	8.6	19.8	30.5	7.2
	35	28.7	26.3	11.9	26.9	29.4	10.1	24.9	32.8	8.5	22.9	36.5	7.0
	40	33.1	29.2	12.2	31.2	32.5	10.4	29.0	36.1	8.8	26.7	40.1	7.4
	52	42.6	38.8	12.1	39.8	43.2	10.3	36.8	48.1	8.6	33.6	53.4	7.1
	60	49.4	43.7	12.2	46.3	48.7	10.3	42.9	54.4	8.7	39.4	60.5	7.2
	70	57.3	51.9	12.1	53.6	57.8	10.2	49.6	64.5	8.6	45.5	71.7	7.1
	80	66.3	58.9	12.4	62.2	66.0	10.5	57.8	73.9	8.8	53.2	82.4	7.3
	90	75.2	67.2	12.5	70.5	74.7	10.6	65.4	82.9	9.0	60.0	91.8	7.5
	100	83.4	74.4	12.4	78.4	82.5	10.6	72.9	91.4	8.9	66.9	101.0	7.5
	110	91.9	81.8	12.5	86.2	90.7	10.7	80.0	100.3	9.0	73.4	110.6	7.5
	120	98.2	90.1	12.2	92.0	99.8	10.4	85.3	110.3	8.8	78.3	121.5	7.4
44	20	17.8	15.0	12.7	16.7	16.7	10.9	15.5	18.5	9.2	14.2	20.5	7.7
	26	22.7	20.0	12.5	21.2	22.3	10.6	19.6	24.8	8.9	17.9	27.5	7.4
	30	25.6	22.2	12.4	24.0	24.7	10.6	22.3	27.6	8.9	20.5	30.7	7.4
	35	29.7	26.6	12.2	27.8	29.6	10.4	25.8	33.0	8.7	23.7	36.7	7.3
	40	34.4	29.5	12.5	32.3	32.8	10.7	30.1	36.4	9.1	27.7	40.4	7.6
	52	44.0	39.2	12.4	41.2	43.7	10.5	38.0	48.5	8.8	34.8	53.8	7.3
	60	51.2	44.1	12.5	48.0	49.1	10.6	44.5	54.7	9.0	40.9	60.9	7.5
	70	59.3	52.4	12.4	55.5	58.4	10.5	51.4	65.0	8.8	47.2	72.2	7.4
	80	68.7	59.4	12.8	64.5	66.6	10.8	59.9	74.4	9.1	55.2	83.0	7.5
	90	77.9	67.8	12.9	73.0	75.3	10.9	67.7	83.6	9.2	62.2	92.4	7.7
	100	86.4	75.0	12.7	81.2	83.1	10.9	75.5	92.0	9.2	69.4	101.6	7.7
	110	95.1	82.6	12.8	89.2	91.5	10.9	82.8	101.1	9.2	76.0	111.4	7.8
	120	101.5	91.0	12.5	95.1	100.7	10.7	88.2	111.2	9.0	81.0	122.3	7.6
46	20	18.4	15.2	13.0	17.2	16.8	11.1	16.0	18.7	9.4	14.7	20.6	7.9
	26	23.4	20.3	12.8	21.9	22.5	10.8	20.2	25.0	9.1	18.5	27.7	7.6
	30	26.5	22.4	12.8	24.9	24.9	10.9	23.1	27.7	9.2	21.2	30.8	7.7
	35	30.7	26.8	12.5	28.7	29.9	10.6	26.7	33.3	9.0	24.5	37.0	7.5
	40	35.6	29.8	12.8	33.5	33.1	11.0	31.2	36.8	9.3	28.7	40.7	7.8
	52	45.5	39.7	12.7	42.5	44.1	10.8	39.3	49.0	9.0	36.0	54.3	7.5
	60	53.1	44.5	12.9	49.7	49.5	10.9	46.2	55.1	9.2	42.4	61.2	7.7
	70	61.4	52.9	12.7	57.4	58.9	10.8	53.2	65.5	9.1	48.8	72.6	7.6
	80	71.1	60.0	13.1	66.7	67.1	11.1	62.1	74.9	9.3	57.2	83.5	7.8
	90	80.5	68.4	13.2	75.5	76.0	11.2	70.0	84.2	9.5	64.3	93.0	7.9
	100	89.4	75.6	13.1	84.0	83.7	11.2	78.1	92.6	9.5	71.8	102.2	7.9
	110	98.3	83.3	13.1	92.2	92.2	11.2	85.6	101.9	9.5	78.6	112.1	8.0
	120	104.9	92.0	12.8	98.3	101.7	10.9	91.2	112.1	9.2	83.8	123.2	7.8

Table 7. Performance Data - 50 Hz - I-P units

Evaporator Leaving Temperature	Unit Size	Condenser Ambient Temperature 85 Tons	85 kW input	85 EER	95 Tons	95 kW input	95 EER	105 Tons	105 kW input	105 EER	115 Tons	115 kW input	115 EER
48	20	19.0	15.3	13.3	17.8	17.0	11.4	16.6	18.8	9.7	15.2	20.8	8.1
	26	24.2	20.5	13.0	22.6	22.8	11.1	20.9	25.2	9.3	19.1	27.9	7.8
	30	27.4	22.6	13.1	25.7	25.1	11.2	23.9	27.9	9.4	22.0	31.0	7.9
	35	31.7	27.1	12.9	29.7	30.1	10.9	27.6	33.5	9.2	25.3	37.2	7.7
	40	36.9	30.2	13.2	34.7	33.5	11.3	32.3	37.1	9.6	29.7	41.0	8.0
	52	47.0	40.2	13.0	43.9	44.6	11.0	40.6	49.4	9.2	37.2	54.7	7.7
	60	54.9	44.9	13.2	51.5	49.9	11.3	47.8	55.5	9.5	44.0	61.6	7.9
	70	63.5	53.4	13.0	59.4	59.4	11.1	55.0	66.0	9.3	50.5	73.1	7.8
	80	73.5	60.5	13.5	69.0	67.6	11.4	64.2	75.5	9.6	59.1	84.0	8.0
	90	83.2	69.1	13.5	78.0	76.6	11.5	72.4	84.8	9.7	66.5	93.6	8.1
	100	92.5	76.2	13.4	86.9	84.4	11.5	80.8	93.3	9.7	74.3	102.8	8.2
	110	101.6	84.1	13.5	95.3	93.0	11.5	88.5	102.7	9.7	81.3	112.9	8.2
	120	108.3	92.9	13.1	101.5	102.6	11.2	94.2	113.1	9.5	86.5	124.1	8.0
50	20	19.6	15.5	13.7	18.4	17.2	11.7	17.1	19.0	9.9	15.7	20.9	8.3
	26	24.9	20.7	13.3	23.3	23.0	11.3	21.5	25.5	9.5	19.7	28.1	7.9
	30	28.3	22.7	13.4	26.6	25.3	11.5	24.7	28.1	9.7	22.7	31.2	8.1
	35	32.8	27.3	13.2	30.7	30.4	11.2	28.5	33.8	9.4	26.2	37.4	7.9
	40	38.2	30.5	13.5	35.9	33.8	11.6	33.4	37.4	9.8	30.8	41.3	8.3
	52	48.5	40.7	13.2	45.3	45.1	11.2	41.9	49.9	9.5	38.4	55.1	7.9
	60	56.8	45.3	13.5	53.3	50.3	11.6	49.4	55.9	9.8	45.5	62.0	8.2
	70	65.6	54.0	13.4	61.4	59.9	11.4	56.9	66.5	9.6	52.3	73.6	8.0
	80	76.0	61.0	13.8	71.3	68.2	11.7	66.4	76.0	9.8	61.2	84.5	8.2
	90	86.0	69.7	13.8	80.6	77.2	11.8	74.8	85.4	10.0	68.7	94.2	8.3
	100	95.6	76.8	13.7	89.8	85.0	11.8	83.5	93.9	10.0	76.8	103.4	8.4
	110	104.9	84.9	13.8	98.4	93.8	11.8	91.3	103.4	10.0	84.0	113.6	8.4
	120	111.8	93.9	13.4	104.7	103.6	11.4	97.2	114.1	9.7	89.3	125.0	8.2

1. Rated in accordance with AHRI Standard 550/590 based on sea level altitude, evaporator fouling factor of 0.00010°F·ft²h/Btu, and evaporator temperature drop of 10°F.
2. kW input is for compressors only.
3. EER = Energy Efficiency Ratio (Btu/watt-hour). Power inputs include: compressors, condenser fans, and control power.
4. Interpolation between points is permissible. Extrapolation is not permitted.
5. Consult Trane representative for performance at temperatures outside of the ranges shown.

Table 8. Performance Data - 50 Hz - SI units

Evaporator Leaving Temperature	Unit Size	Condenser Ambient Temperature 30 kW cooling	30 kW input	30 COP	35 kW cooling	35 kW input	35 COP	40 kW cooling	40 kW input	40 COP	45 kW cooling	45 kW input	45 COP
	20	62.6	15.2	3.7	59.1	16.7	3.2	55.2	18.3	2.8	51.3	20.1	2.3
	26	79.8	20.3	3.6	74.9	22.3	3.1	70.0	24.6	2.7	64.3	27.0	2.3
	30	90.0	22.5	3.6	85.1	24.8	3.1	79.5	27.3	2.7	73.8	30.1	2.3
	35	104.4	26.9	3.5	98.5	29.7	3.1	92.1	32.7	2.6	85.4	36.0	2.2
	40	121.0	29.9	3.6	114.3	32.9	3.2	107.2	36.1	2.7	99.9	39.6	2.3
	52	155.1	39.7	3.6	145.6	43.8	3.1	135.7	48.1	2.6	125.5	52.8	2.2
7	**60**	180.4	44.6	3.6	170.2	49.2	3.1	158.9	54.2	2.7	147.7	59.7	2.3
	70	208.9	53.1	3.6	196.5	58.5	3.1	183.5	64.4	2.6	170.2	70.8	2.3
	80	241.6	60.2	3.7	228.2	66.7	3.2	213.8	73.7	2.7	199.0	81.3	2.3
	90	273.9	68.6	3.7	258.4	75.5	3.2	241.6	82.9	2.8	224.3	90.7	2.3
	100	304.1	75.9	3.7	287.6	83.2	3.2	269.3	91.2	2.8	250.0	99.7	2.3
	110	334.4	83.6	3.7	315.7	91.6	3.2	295.3	100.2	2.8	273.9	109.4	2.4
	120	357.2	92.1	3.6	336.8	100.9	3.1	314.7	110.3	2.7	292.2	120.2	2.3
	20	66.5	15.5	3.8	62.6	17.0	3.3	58.7	18.6	2.9	54.5	20.4	2.5
	26	84.4	20.7	3.8	79.5	22.8	3.3	73.8	25.0	2.8	68.2	27.3	2.3
	30	95.6	22.8	3.8	90.4	25.1	3.3	84.7	27.6	2.8	78.8	30.4	2.4
	35	110.8	27.4	3.7	104.4	30.1	3.2	97.7	33.2	2.8	90.7	36.4	2.3
	40	129.0	30.5	3.8	122.0	33.5	3.3	114.3	36.7	2.8	106.2	40.2	2.4
	52	164.2	40.6	3.8	154.4	44.6	3.2	144.2	49.0	2.8	133.3	53.6	2.3
9	**60**	192.0	45.3	3.8	181.1	49.9	3.3	169.5	54.9	2.8	157.2	30.3	2.4
	70	221.9	54.0	3.8	208.9	59.4	3.3	195.1	65.3	2.8	181.1	71.7	2.4
	80	257.0	61.2	3.9	242.6	67.6	3.3	227.5	74.7	2.9	211.7	82.2	2.4
	90	290.8	69.8	3.9	274.3	76.6	3.4	256.7	84.0	2.9	238.0	91.8	2.5
	100	323.1	77.0	3.9	305.5	84.4	3.4	286.2	92.3	2.9	265.8	100.8	2.5
	110	355.1	85.0	3.9	335.1	93.0	3.4	313.6	101.7	2.9	291.1	110.8	2.5
	120	378.7	93.8	3.8	356.9	102.6	3.3	333.7	112.0	2.8	309.8	121.8	2.4

1. Rated in accordance with AHRI Standard 550/590, based on sea level altitude, evaporator fouling factor of 0.01761 m^2-°C/kW, and evaporator temperature drop of 5°C.
2. COP = Coefficient of Performance. Power inputs include: compressors, condenser fans, and control power.
3. kW input is for compressors only.
4. Interpolation between points is permissible. Extrapolation is not permitted.
5. Consult Trane representative for performance at temperatures outside of the ranges shown.

Table 9. Part Load Performance - 60 Hz

Unit Size	Full Load Tons	Full Load EER	IPLV EER	Full Load kW cooling	Full Load COP	IPLV COP
20	19.6	10.1	13.9	68.8	3.0	4.1
26	25.0	10.0	15.1	87.9	2.9	4.4
30	28.2	10.1	15.1	99.2	3.0	4.4
35	33.1	10.0	15.3	116.4	2.9	4.5
40	38.2	10.0	13.6	134.2	2.9	4.0
52	49.0	10.0	15.1	172.2	2.9	4.4
60	56.6	10.3	15.3	199.0	3.0	4.5
70	66.3	10.2	15.5	233.0	3.0	4.5
80	75.8	10.5	15.5	266.5	3.1	4.5
90	85.4	10.4	16.0	300.2	3.1	4.7
100	96.0	10.6	15.2	337.4	3.1	4.4
110	104.4	10.3	15.1	367.0	3.0	4.4
120	113.9	10.1	15.1	400.5	2.9	4.4

1. IPLV values are rated in accordance with AHRI Standard 550/590.
2. EER/COP and IPLV values include compressors, condenser fans, and control kW.
3. Performance is based on 460 voltage.

Table 10. Part Load Performance - 50 Hz

Unit Size	Full Load Tons	Full Load EER	IPLV EER	Full Load kW cooling	Full Load COP	IPLV COP
20	16.7	10.9	15.7	58.6	3.2	4.6
26	21.2	10.6	16.5	74.4	3.1	4.8
30	24.0	10.6	15.8	84.5	3.1	4.6
35	27.8	10.4	15.8	97.7	3.0	4.6
40	32.3	10.7	15.3	113.6	3.1	4.5
52	41.2	10.5	16.4	144.7	3.1	4.8
60	48.0	10.6	15.8	168.8	3.1	4.6
70	55.5	10.5	16.0	195.0	3.1	4.7
80	64.5	10.8	16.5	226.7	3.2	4.8
90	73.0	10.9	17.2	256.6	3.2	5.0
100	81.2	10.9	16.0	285.5	3.2	4.7
110	89.2	10.9	16.4	313.6	3.2	4.8
120	95.1	10.7	16.8	334.5	3.1	4.9

1. IPLV values are rated in accordance with AHRI Standard 550/590.
2. EER/COP and IPLV values include compressors, condenser fans, and control kW.

Controls

LCD Touch-Screen Display with Multi-Language Support

The standard DynaView display provided with the Trane CH530 control panel features an LCD touch-screen that is navigated by file tabs. This is an advanced interface that allows the user to access any important information concerning setpoints, active temperatures, modes, electrical data, pressure, and diagnostics. It uses full text display available in 19 languages.

Display Features Include:

- LCD touch-screen with LED backlighting, for scrolling access to input and output operating information
- Single-screen, folder/tab-style display of all available information on individual components (evaporator, condenser, compressor, etc.)
- Password entry/lockout system to enable or disable display
- Automatic and immediate stop capabilities for standard or immediate manual shutdown
- Fast, easy access to available chiller data in tabbed format, including:
  - Modes of operation, including normal cooling as well as ice making
  - Water temperatures and setpoints
  - Loading and limiting status and setpoints
  - Outdoor air temperature
  - Start/stop differential timers
  - Pump status and override
  - Chilled water reset settings
- Optional external setpoints, including:
  - Chilled water
  - Demand limit
  - Ice building

Reports, listed on a single tabbed screen for easy access, including:

- ASHRAE, containing all guideline 3 report information
- Evaporator
- Condenser
- Compressor

Evaporator, condenser, and compressor reports containing all operational information on individual components, including:

- Water temperatures
- Refrigerant pressures, temperatures, and approach
- Flow switch status
- EXV position
- Compressor starts and run-time

Alarm and diagnostic information, including:

- Flashing alarms with touch-screen button for immediate address of alarm condition
- Scrollable list of last ten active diagnostics
- Specific information on applicable diagnostic from list of over one-hundred
- Automatic or manual resetting diagnostic types

Adaptive Controls

Adaptive Controls directly sense the control variables that govern the operation of the chiller: evaporator pressure and condenser pressure. When any one of these variables approaches a limit condition when damage may occur to the unit or shutdown on a safety, Adaptive Controls takes corrective action to avoid shutdown and keep the chiller operating. This happens through combined actions of compressor and/or fan staging. Whenever possible, the chiller is allowed to continue making chilled water. This keeps cooling capacity available unit the problem can be solved. Overall, the safety controls help keep the building or process running and out of trouble.

Stand-Alone Controls

Single chillers installed in applications without a building management system is simple to install and control: only a remote auto/stop for scheduling is required for unit operation. Signals from the chilled-water pump contactor auxiliary, or a flow switch, are wired to the chilled-water flow interlock. Signals from a time clock or some other remote device are wired to the external auto/stop input.

- Auto/Stop - A job-site provided contact closure turns the unit on and off.
- External Interlock - A job-site provided contact opening wired to this input turns the unit off and require a manual reset of the unit microcomputer. This closure is typically triggered by a job-site provided system such as a fire alarm.

Time of Day Scheduling

Time of day scheduling allows the customer to perform simple chiller scheduling without the need for a building automation system.

This feature allows the user to set ten events in a seven day time period. For each event the user can specify an activation time and the days of the week the event is active. Any available setpoints can be specified for each event, such as the leaving chilled water temperature (standard) and the demand limit setpoint (optional if ordered).

Required features:

- Time of day scheduling (selectable option with chiller)

Additional options that if ordered may be incorporated into the scheduling:

- External chilled water setpoint, external demand limit setpoint
- Ice-making initiation

Hardwire Points

Microcomputer controls allow simple interface with other control systems, such as time clocks, building automation systems, and ice storage systems via hardwire points. This means you have the flexibility to meet job requirements while not having to learn a complicated control system.

Remote devices are wired from the control panel to provide auxiliary control to a building automation system. Inputs and outputs can be communicated via a typical 4–20 mA electrical signal, an equivalent 2–10 Vdc signal, or by utilizing contact closures.

This setup has the same stand features as a stand-alone water chiller, with the possibility of having additional optional features:

- Ice making control
- External chilled water setpoint, external demand limit setpoint
- Chilled water temperature reset
- Programmable relays - available outputs are: alarm-latching, alarm-auto reset, general alarm, warning, chiller limit mode, compressor running, and Tracer control

BACnet Interface

BACnet interface capabilities are available, with communication link via single twisted-pair wiring to a factory-installed and tested communication board.

Required features:

- BACnet Interface (selectable option with chiller)

BACnet is a data communication protocol for building automation and control networks developed by American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

LonTalk LCI-C Interface

LonTalk (LCI-C) communications capabilities are available, with communication link via single twisted-pair wiring to factory-installed, tested communication board.

Required features:

- LonTalk/Tracer Summit Interface (selectable option with chiller)

LonTalk is a communications protocol developed by the Echelon Corporation. The LonMark association develops control profiles using the LonTalk communication protocol. LonTalk is a unit level communications protocol.

LonTalk Communications Interface for Chillers (LCI-C) provides a generic automation system with the LonMark chiller profile inputs/outputs. In addition to the standard points, Trane provides other commonly used network output variables for greater interoperability with any automation system. The complete reference list of Trane LonTalk points is available on the LonMark web site.

Trane controls or another vendor's system can use the predefined list of points with ease to give the operator a complete picture of how the system is running

Tracer Summit

The chiller plant control capabilities of the Trane Tracer Summit building automation system are unequaled in the industry. Trane's depth of experience in chillers and controls makes us a well-qualified choice for automation of chiller plants using air-cooled CGAM chillers. Our chiller plant automation software is fully pre-engineered and tested.

Required features:

- LonTalk/Tracer Summit Interface (selectable option with chiller)
- Building Control Unit (external device required)

Energy Efficiency

- Sequences starting of chillers to optimize the overall chiller plant energy efficiency
  - Individual chillers operate as base, peak, or swing based on capacity and efficiency
  - Automatically rotates individual chiller operation to equalize runtime and wear between chillers.
  - Evaluates and selects the lowest energy consumption alternative from an overall system perspective.

Regulatory Compliance Documentation

- Gathers information and generates the reports mandated in ASHRAE Guideline 3.

Easy Operation and Maintenance

- Remote monitoring and control
- Displays both current operation conditions and scheduled automated control actions
- Concise reports assist in planning for preventative maintenance and verifying performance
- Alarm notification and diagnostic messages aid in quick and accurate troubleshooting

When integrated with a Tracer Summit building management system the total building operation can be optimized. With this system option, the full breadth of Trane's HVAC and controls experience are applied to offer solutions to many facility issues. If your project calls for an interface to other systems, Tracer Summit can share data via BACnet, the ASHRAE open systems protocol.

Chiller Level Controls

Building Level Controls

LCI-C
LCI - Lon Talk/Tracer Summit Interface
1A15 - Analog input/output
J2-1, 2

→ Tracer Sumit or LON

BACnet
BCNT - Unit level BACnet interface
1A15 - Analog input/output
J2-1, 2

→ BACnet

Programmable Relay
PRLY - Programmable relay outputs
1A18 - Binary output
1A18 - J2-1, 3/J2-2, 3 NO/NC
J2-4, 6/J2-5, 6 NO/NC
J2-7, 9/J2-8, 9 NO/NC
J2-10, 12/J2-11,12 NO/NC

→ BMS

External Chilled Water Setpoint
Demand Limit Setpoint
SETA 4-20mA
SETB 2-10VDC
1A14 Analog input/output
J2-2, 3 Chilled water set point
J2-5, 6 Demand limit set point

→ BMS

Ice Making with hard wire interface
ICE - Ice making status
1A16 - Binary input
J2-1, 2 NO

→ BMS

Capacity Output
PCAP 2-10VDC output
1A25 Analog output
J2-4, 6

→ BMS

NO - Normaly open contacts
NC - Normaly closed contacts
BMS - Generic building managment system

Electrical

Table 11. Electrical Data - 60 Hz

Unit Size	Rated Power	Number Circuits	Qty Comp	Qty Fans	Fan Motor Power (kw)	Cond Fan FLA	Compressor RLA[1] [2]	Compressor LRA[1] [3]
	208/60/3	1	2	2	1	6.2	39.1-39.1	267-267
	230/60/3	1	2	2	1	6.7	39.1-39.1	267-267
20	380/60/3	1	2	2	1	3.7	22.4-22.4	160-160
	460/60/3	1	2	2	1	3.2	18.6-18.6	142-142
	575/60/3	1	2	2	1	2.6	15.4-15.4	103-103
	208/60/3	1	2	2	1	6.2	50.6-50.6	315-315
	230/60/3	1	2	2	1	6.7	44.3-44.3	315-315
26	380/60/3	1	2	2	1	3.7	26.3-26.3	177-177
	460/60/3	1	2	2	1	3.2	21.2-21.2	158-158
	575/60/3	1	2	2	1	2.6	15.4-15.4	103-103
	208/60/3	1	2	3	1	6.2	57.5-57.5	485-485
	230/60/3	1	2	3	1	6.7	50.4-50.4	485-485
30	380/60/3	1	2	3	1	3.7	31.2-31.2	210-210
	460/60/3	1	2	3	1	3.2	25.8-25.8	160-160
	575/60/3	1	2	3	1	2.6	20.6-20.6	135-135
	208/60/3	1	2	3	1	6.2	57.5-87.1	485-485
	230/60/3	1	2	3	1	6.7	50.4-76.2	485-485
35	380/60/3	1	2	3	1	3.7	31.2-39.9	210-260
	460/60/3	1	2	3	1	3.2	25.8-33.0	160-215
	575/60/3	1	2	3	1	2.6	20.6-26.4	135-175
	208/60/3	2	4	4	1	6.2	39.1-39.1	278-278
	230/60/3	2	4	4	1	6.7	39.1-39.1	278-278
40	380/60/3	2	4	4	1	3.7	22.4-22.4	177-177
	460/60/3	2	4	4	1	3.2	18.6-18.6	130-130
	575/60/3	2	4	4	1	2.6	15.4-15.4	104-104
	208/60/3	2	4	4	1	6.2	50.6-50.6	338-338
	230/60/3	2	4	4	1	6.7	44.3-44.3	338-338
52	380/60/3	2	4	4	1	3.7	26.3-26.3	196-196
	460/60/3	2	4	4	1	3.2	21.2-21.2	158-158
	575/60/3	2	4	4	1	2.6	18.6-18.6	126-126
	208/60/3	2	4	6	1	6.2	57.5-57.5	485-485
	230/60/3	2	4	6	1	6.7	50.4-50.4	485-485
60	380/60/3	2	4	6	1	3.7	31.2-31.2	210-210
	460/60/3	2	4	6	1	3.2	25.8-25.8	160-160
	575/60/3	2	4	6	1	2.6	20.6-20.6	135-135

1. Data shown for circuit one. The second circuit is always the same.
2. RLA - Rated Load Amps - Rated in accordance with UL Standard 1995.
3. LRA - Locked Rotor Amps - Based on full winding starts.
4. Units have single point power connection as standard. Optional dual point power connections are available for 40-120 ton units.
5. Voltage Utilization Range: +/- 10% of rated voltage
   Rated voltage (use range): 208/60/3 (187.2-228.8), 230/60/3(208-254), 380/60/3 (342-418), 460/60/3 (414-506), 575/60/3 (516-633)
6. One separate 120/60/1, 15 amp customer provided power connection is required to power the heaters.

Table 11. Electrical Data - 60 Hz

Unit Size	Rated Power	Number Circuits	Qty Comp	Qty Fans	Fan Motor Power (kw)	Cond Fan FLA	Compressor RLA[1] [2]	Compressor LRA[1] [3]
	208/60/3	2	4	6	1	6.2	57.5-87.1	485-485
	230/60/3	2	4	6	1	6.7	50.4-76.2	485-485
70	380/60/3	2	4	6	1	3.7	31.2-39.9	210-260
	460/60/3	2	4	6	1	3.2	25.8-33.0	160-215
	575/60/3	2	4	6	1	2.6	20.6-26.4	135-175
	208/60/3	2	4	6	1	6.2	87.1-87.1	485-485
	230/60/3	2	4	6	1	6.7	76.2-76.2	485-485
80	380/60/3	2	4	6	1	3.7	39.9-39.9	260-260
	460/60/3	2	4	6	1	3.2	33.0-33.0	215-215
	575/60/3	2	4	6	1	2.6	26.4-26.4	175-175
	208/60/3	2	4	6	1	6.2	87.1-99.4	485-560
	230/60/3	2	4	6	1	6.7	76.2-86.9	485-560
90	380/60/3	2	4	6	1	3.7	39.9-54.5	260-310
	460/60/3	2	4	6	1	3.2	33.0-41.9	215-260
	575/60/3	2	4	6	1	2.6	26.4-34.0	175-210
	208/60/3	2	4	8	1	6.2	99.4-99.4	560-560
	230/60/3	2	4	8	1	6.7	86.9-86.9	560-560
100	380/60/3	2	4	8	1	3.7	54.5-54.5	310-310
	460/60/3	2	4	8	1	3.2	41.9-41.9	260-260
	575/60/3	2	4	8	1	2.6	34.0-34.0	210-210
	208/60/3	2	4	8	1	6.2	99.4-119.4	560-680
	230/60/3	2	4	8	1	6.7	86.9-109.0	560-680
110	380/60/3	2	4	8	1	3.7	54.5-59.6	310-360
	460/60/3	2	4	8	1	3.2	41.9-50.6	260-320
	575/60/3	2	4	8	1	2.6	34.4-38.6	210-235
	208/60/3	2	4	8	1	6.2	119.4-119.4	680-680
	230/60/3	2	4	8	1	6.7	109.0-109.0	680-680
120	380/60/3	2	4	8	1	3.7	59.6-59.6	360-360
	460/60/3	2	4	8	1	3.2	50.6-50.6	320-320
	575/60/3	2	4	8	1	2.6	38.6-38.6	235-235

1. Data shown for circuit one. The second circuit is always the same.
2. RLA - Rated Load Amps - Rated in accordance with UL Standard 1995.
3. LRA - Locked Rotor Amps - Based on full winding starts.
4. Units have single point power connection as standard. Optional dual point power connections are available for 40-120 ton units.
5. Voltage Utilization Range: +/- 10% of rated voltage
   Rated voltage (use range): 208/60/3 (187.2-228.8), 230/60/3(208-254), 380/60/3 (342-418), 460/60/3 (414-506), 575/60/3 (516-633)
6. One separate 120/60/1, 15 amp customer provided power connection is required to power the heaters.

Table 12. Electrical Data - 60 Hz - Unit Wiring - MCA/MOPD

Unit Size	Rated Power	Single Point Power		Dual Point Power			
				Circuit 1		Circuit 2	
		MCA[1]	MOPD[2]	MCA[1]	MOPD[2]	MCA[1]	MOPD[2]
20	208/60/3	105.6	125				
	230/60/3	105.5	125				
	380/60/3	60.0	80		n/a		
	460/60/3	50.5	60				
	575/60/3	44.4	50				
26	208/60/3	131.5	175				
	230/60/3	117.2	150				
	380/60/3	68.7	90		n/a		
	460/60/3	56.4	70				
	575/60/3	49.6	60				
30	208/60/3	153.2	200				
	230/60/3	137.7	175				
	380/60/3	83.5	110		n/a		
	460/60/3	69.9	90				
	575/60/3	56.7	70				
35	208/60/3	190.2	250				
	230/60/3	169.9	225				
	380/60/3	94.3	125		n/a		
	460/60/3	78.9	110				
	575/60/3	63.9	90				
40	208/60/3	197.3	225	105.6	125	101.5	125
	230/60/3	197.7	225	105.5	125	102.0	125
	380/60/3	112.2	125	60.0	80	57.8	80
	460/60/3	94.6	110	50.5	60	48.7	60
	575/60/3	79.4	90	42.3	50	40.9	50
52	208/60/3	246.2	250	131.5	175	127.4	175
	230/60/3	219.8	250	117.2	150	113.7	150
	380/60/3	128.6	150	68.7	90	66.5	90
	460/60/3	105.7	125	56.4	70	54.6	70
	575/60/3	93.0	110	49.6	60	48.1	60
60	208/60/3	287.9	300	153.2	200	149.1	200
	230/60/3	259.2	300	137.7	175	134.1	175
	380/60/3	157.0	175	83.5	110	81.3	110
	460/60/3	131.6	150	69.9	90	68.2	90
	575/60/3	106.8	125	56.7	70	55.3	70

1. MCA - Minimum Circuit Ampacity-125 percent of largest compressor RLA plus 100 percent of all other loads per NEC 440-33 2008.
2. Max Fuse or HACR type breaker or MOPD -225 percent of the largest compressor RLA plus all other loads per NEC 440-22 2008.
3. Data shown for circuit one. The second circuit is always the same.
4. Local codes may take precedence.
5. n/a - not available

Table 12. Electrical Data - 60 Hz - Unit Wiring - MCA/MOPD

Unit Size	Rated Power	Single Point Power		Dual Point Power			
				Circuit 1		Circuit 2	
		MCA[1]	MOPD[2]	MCA[1]	MOPD[2]	MCA[1]	MOPD[2]
70	208/60/3	354.5	400	190.2	250	186.1	250
	230/60/3	317.2	350	169.9	225	166.4	225
	380/60/3	176.5	200	94.3	125	92.2	125
	460/60/3	147.8	175	78.9	110	77.2	110
	575/60/3	119.8	125	63.9	90	62.5	80
80	208/60/3	401.3	500	213.6	300	209.5	250
	230/60/3	355.4	400	189.0	250	185.5	250
	380/60/3	186.5	225	99.3	125	97.2	125
	460/60/3	155.8	175	82.9	110	81.2	110
	575/60/3	126.2	150	67.1	90	65.7	90
90	208/60/3	441.4	500	235.2	300	231.1	300
	230/60/3	392.9	450	209.1	250	205.5	250
	380/60/3	226.8	250	121.3	175	119.1	150
	460/60/3	182.3	200	97.3	125	95.5	125
	575/60/3	148.5	175	79.2	110	77.8	110
100	208/60/3	478.4	500	253.7	350	249.6	300
	230/60/3	427.5	500	226.5	300	222.7	300
	380/60/3	263.3	300	139.6	175	137.4	175
	460/60/3	206.5	225	109.4	150	107.6	125
	575/60/3	168.9	200	89.4	110	88.0	110
110	208/60/3	523.4	600	278.7	350	274.6	350
	230/60/3	477.4	500	254.1	350	250.6	350
	380/60/3	274.8	300	145.9	200	143.8	200
	460/60/3	226.1	250	120.3	150	118.5	150
	575/60/3	179.3	200	95.2	125	93.8	125
120	208/60/3	563.4	600	298.7	400	294.6	400
	230/60/3	521.6	600	276.2	350	272.7	350
	380/60/3	285.1	300	151.1	200	148.9	200
	460/60/3	243.6	250	129.0	175	127.2	175
	575/60/3	188.5	225	99.8	125	98.4	125

1. MCA - Minimum Circuit Ampacity-125 percent of largest compressor RLA plus 100 percent of all other loads per NEC 440-33 2008.
2. Max Fuse or HACR type breaker or MOPD -225 percent of the largest compressor RLA plus all other loads per NEC 440-22 2008.
3. Data shown for circuit one. The second circuit is always the same.
4. Local codes may take precedence.
5. n/a - not available

Table 13. Lug Range Size - 60 Hz - Standard Unit

		Single Point Power			Dual Point Power		
Unit Size	Rated Power	Terminal Blocks	Std Fault Ckt Breaker[1]	High Fault Ckt Breaker[1]	Terminal Blocks	Std Fault Ckt Breaker[1]	High Fault Ckt Breaker[1]
	208/60/3	#6 - 350 MCM	#3 - 3/0	#3 - 3/0			
	230/60/3	#6 - 350 MCM	#3 - 3/0	#3 - 3/0			
20	380/60/3	#6 - 350 MCM	#10 - 1/0	#10 - 1/0		n/a	
	460/60/3	#6 - 350 MCM	#10 - 1/0	#10 - 1/0			
	575/60/3	#6 - 350 MCM	#10 - 1/0	n/a			
	208/60/3	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM			
	230/60/3	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM			
26	380/60/3	#6 - 350 MCM	#10 - 1/0	#10 - 1/0		n/a	
	460/60/3	#6 - 350 MCM	#10 - 1/0	#10 - 1/0			
	575/60/3	#6 - 350 MCM	#10 - 1/0	n/a			
	208/60/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM			
	230/60/3	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM			
30	380/60/3	#6 - 350 MCM	#3 - 3/0	#3 - 3/0		n/a	
	460/60/3	#6 - 350 MCM	#10 - 1/0	#10 - 1/0			
	575/60/3	#6 - 350 MCM	#10 - 1/0	n/a			
	208/60/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM			
	230/60/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM			
35	380/60/3	#6 - 350 MCM	#3 - 3/0	#3 - 3/0		n/a	
	460/60/3	#6 - 350 MCM	#3 - 3/0	#3 - 3/0			
	575/60/3	#6 - 350 MCM	#10 - 1/0	n/a			
	208/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM
	230/60/3	#4 - 500 MCM	3/0 - 500 MCM	#6 - 350 MCM	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM
40	380/60/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	460/60/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#10 - 1/0	#10 - 1/0
	575/60/3	#4 - 500 MCM	#6 - 350 MCM	n/a	#6 - 350 MCM	#10 - 1/0	n/a
	208/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM
	230/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM
52	380/60/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	460/60/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	575/60/3	#4 - 500 MCM	#6 - 350 MCM	n/a	#6 - 350 MCM	#10 - 1/0	n/a
	208/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM
	230/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM
60	380/60/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	460/60/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	575/60/3	#4 - 500 MCM	#6 - 350 MCM	n/a	#6 - 350 MCM	#6 - 350 MCM	n/a

1. Optional circuit breaker and high fault circuit breaker.
2. Will accept two conduits per phase in this size.
3. Copper wire only, based on nameplate Minimum Circuit Ampacity (MCA).
4. Data shown for circuit one. The second circuit is always the same.
5. n/a - not available

Table 13. Lug Range Size - 60 Hz - Standard Unit

		Single Point Power			Dual Point Power		
Unit Size	**Rated Power**	**Terminal Blocks**	**Std Fault Ckt Breaker[1]**	**High Fault Ckt Breaker[1]**	**Terminal Blocks**	**Std Fault Ckt Breaker[1]**	**High Fault Ckt Breaker[1]**
70	208/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM
	230/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM
	380/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	460/60/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	575/60/3	#4 - 500 MCM	#6 - 350 MCM	n/a	#6 - 350 MCM	#6 - 350 MCM	n/a
80	208/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM
	230/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM
	380/60/3	#6 - 350 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	460/60/3	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	575/60/3	#6 - 350 MCM	#6 - 350 MCM	n/a	#6 - 350 MCM	#6 - 350 MCM	n/a
90	208/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]
	230/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM
	380/60/3	#6 - 350 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	460/60/3	#6 - 350 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	575/60/3	#6 - 350 MCM	#6 - 350 MCM	n/a	#6 - 350 MCM	#6 - 350 MCM	n/a
100	208/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]
	230/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]
	380/60/3	#6 - 350 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	460/60/3	#6 - 350 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	575/60/3	#6 - 350 MCM	#6 - 350 MCM	n/a	#6 - 350 MCM	#6 - 350 MCM	n/a
110	208/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]
	230/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]
	380/60/3	#6 - 350 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	460/60/3	#6 - 350 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	575/60/3	#6 - 350 MCM	3/0 - 500 MCM[2]	n/a	#6 - 350 MCM	#6 - 350 MCM	n/a
120	208/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]
	230/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]
	380/60/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	460/60/3	#6 - 350 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
	575/60/3	#6 - 350 MCM	3/0 - 500 MCM[2]	n/a	#6 - 350 MCM	#6 - 350 MCM	n/a

1. Optional circuit breaker and high fault circuit breaker.
2. Will accept two conduits per phase in this size.
3. Copper wire only, based on nameplate Minimum Circuit Ampacity (MCA).
4. Data shown for circuit one. The second circuit is always the same.
5. n/a - not available

Table 14. Electrical Data - 50Hz

Unit Size	Rated Power	Number Circuits	Qty Comp	Qty Fans	Fan Motor Power (kW)	Cond Fan FLA	Compressor RLA[1] [2]	Compressor LRA[1] [3]
20	400/50/3	1	2	2	1	2.4	18.6-18.6	130-130
26	400/50/3	1	2	2	1	2.4	22.4-22.4	158-158
30	400/50/3	1	2	3	1	2.4	26.6-26.6	160-160
35	400/50/3	1	2	3	1	2.4	26.6-33.3	160-215
40	400/50/3	2	4	4	1	2.4	18.6-18.6	130-130
52	400/50/3	2	4	4	1	2.4	22.4-22.4	158-158
60	400/50/3	2	4	6	1	2.4	26.6-26.6	160-160
70	400/50/3	2	4	6	1	2.4	26.6-33.3	160-215
80	400/50/3	2	4	6	1	2.4	33.2-33.2	175-175
90	400/50/3	2	4	6	1	2.4	33.2-42.5	175-210
100	400/50/3	2	4	8	1	2.4	42.5-42.5	210-210
110	400/50/3	2	4	8	1	2.4	42.5-46.9	210-235
120	400/50/3	2	4	8	1	2.4	46.9-46.9	235-235

1. Data shown for circuit one. The second circuit is always the same.
2. RLA - Rated Load Amps - Rated in accordance with UL Standard 1995.
3. LRA - Locked Rotor Amps - Based on full winding starts.
4. Units have single point power connection as standard. Optional dual point power connections are available for 40-120 ton units.
5. Voltage Utilization Range:
   Rated voltage (use range): 400/50/3 (360-440)
6. One separate 120/50/1, 15 amp customer provided power connection is required to power the heaters.

Table 15. Electrical Data - 50 Hz - Unit Wiring - MCA/MOPD

Unit	Rated	Single Point Power		Dual Point Power			
Size	Power	MCA[1]	MOPD[2]	MCA[1]	MOPD[2]	MCA[1]	MOPD[2]
20	400/50/3	45.5	60	n/a			
26	400/50/3	54.5	70				
30	400/50/3	70.6	90				
35	400/50/3	78.8	110				
40	400/50/3	84.8	100	45.5	60	43.5	60
52	400/50/3	101.8	110	54.5	70	52.5	70
60	400/50/3	132.5	150	70.6	90	68.6	90
70	400/50/3	147.2	175	78.8	110	76.7	100
80	400/50/3	155.4	175	82.9	110	80.8	110
90	400/50/3	181.1	200	96.9	125	94.8	125
100	400/50/3	204.5	225	108.6	125	106.5	125
110	400/50/3	214.4	250	114.1	150	112.0	150
120	400/50/3	223.2	250	118.5	150	116.4	150

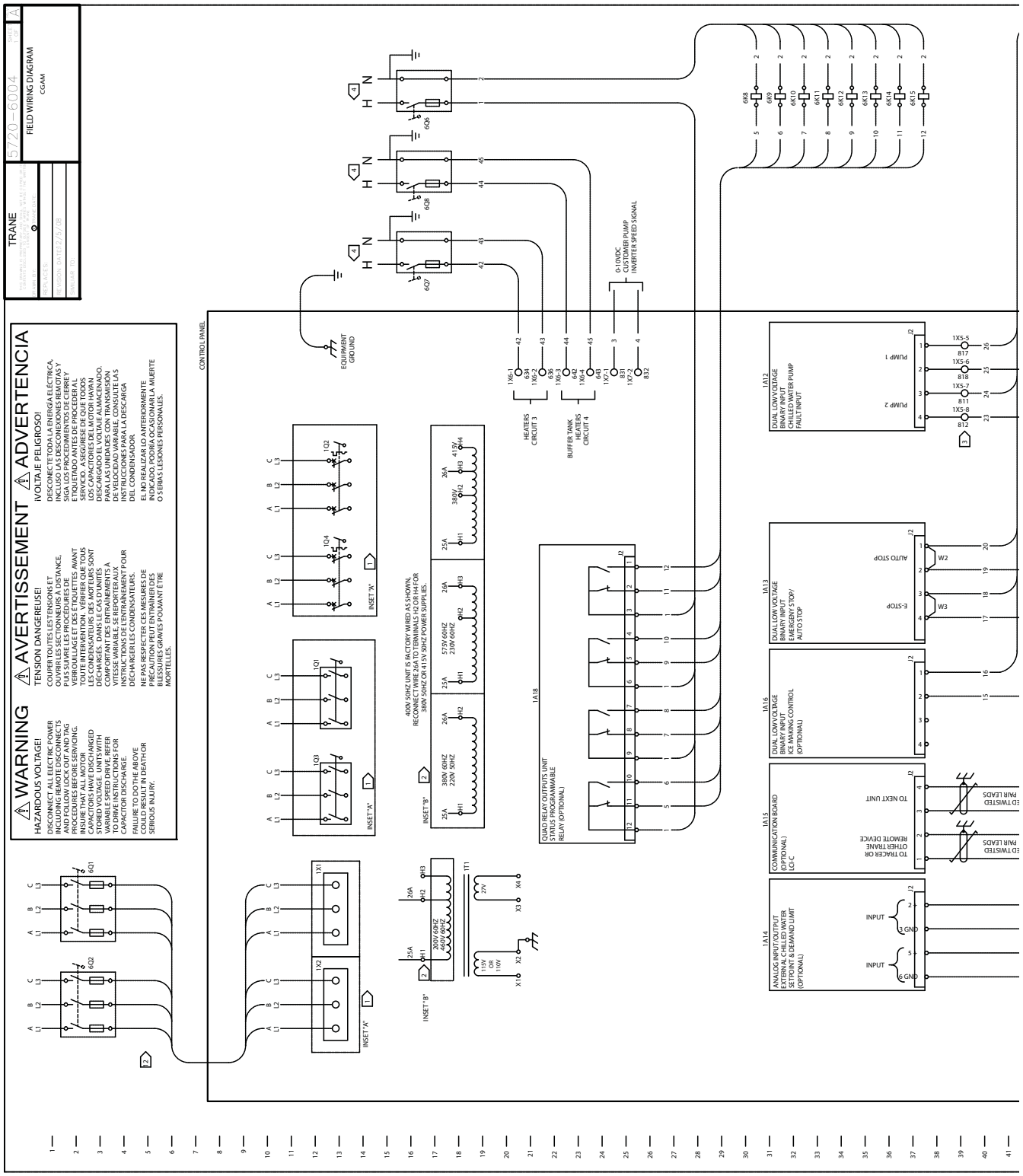
1. MCA - Minimum Circuit Ampacity-125 percent of largest compressor RLA plus 100 percent of all other loads per NEC 440-33 2008.
2. MOPD or Max Fuse or HACR type breaker-225 percent of the largest compressor RLA plus 100 percent of all other loads per NEC 440-22 2008.
3. Data shown for circuit one. The second circuit is always the same.
4. Local codes may take precedence.
5. n/a - means option not available with voltage.

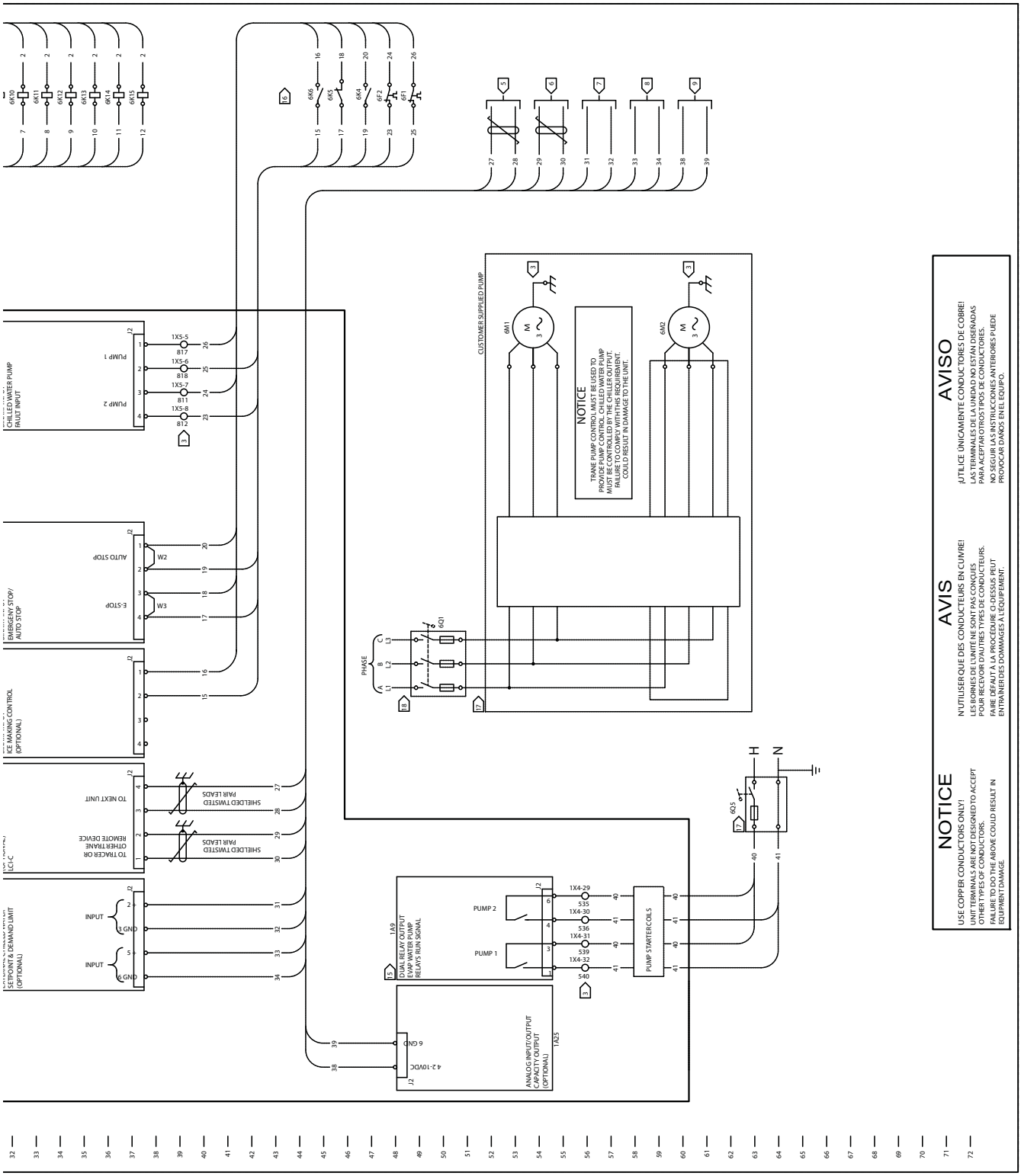
Table 16. Lug Size Range - 50 Hz

		Single Point Power			Dual Point Power		
Unit Size	**Rated Power**	**Terminal Blocks**	**Std Fault Ckt Breaker[1]**	**High Fault Ckt Breaker[1]**	**Terminal Blocks**	**Std Fault Ckt Breaker[1]**	**High Fault Ckt Breaker[1]**
20	400/50/3	#6 - 350 MCM	#10 - 1/0	#10 - 1/0	n/a		
26	400/50/3	#6 - 350 MCM	#10 - 1/0	#10 - 1/0			
30	400/50/3	#6 - 350 MCM	#10 - 1/0	#10 - 1/0			
35	400/50/3	#6 - 350 MCM	#3 - 3/0	#3 - 3/0			
40	400/50/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#10 - 1/0	#10 - 1/0
52	400/50/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
60	400/50/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
70	400/50/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
80	400/50/3	#4 - 500 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
90	400/50/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
100	400/50/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
110	400/50/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM
120	400/50/3	#4 - 500 MCM	3/0 - 500 MCM[2]	3/0 - 500 MCM[2]	#6 - 350 MCM	#6 - 350 MCM	#6 - 350 MCM

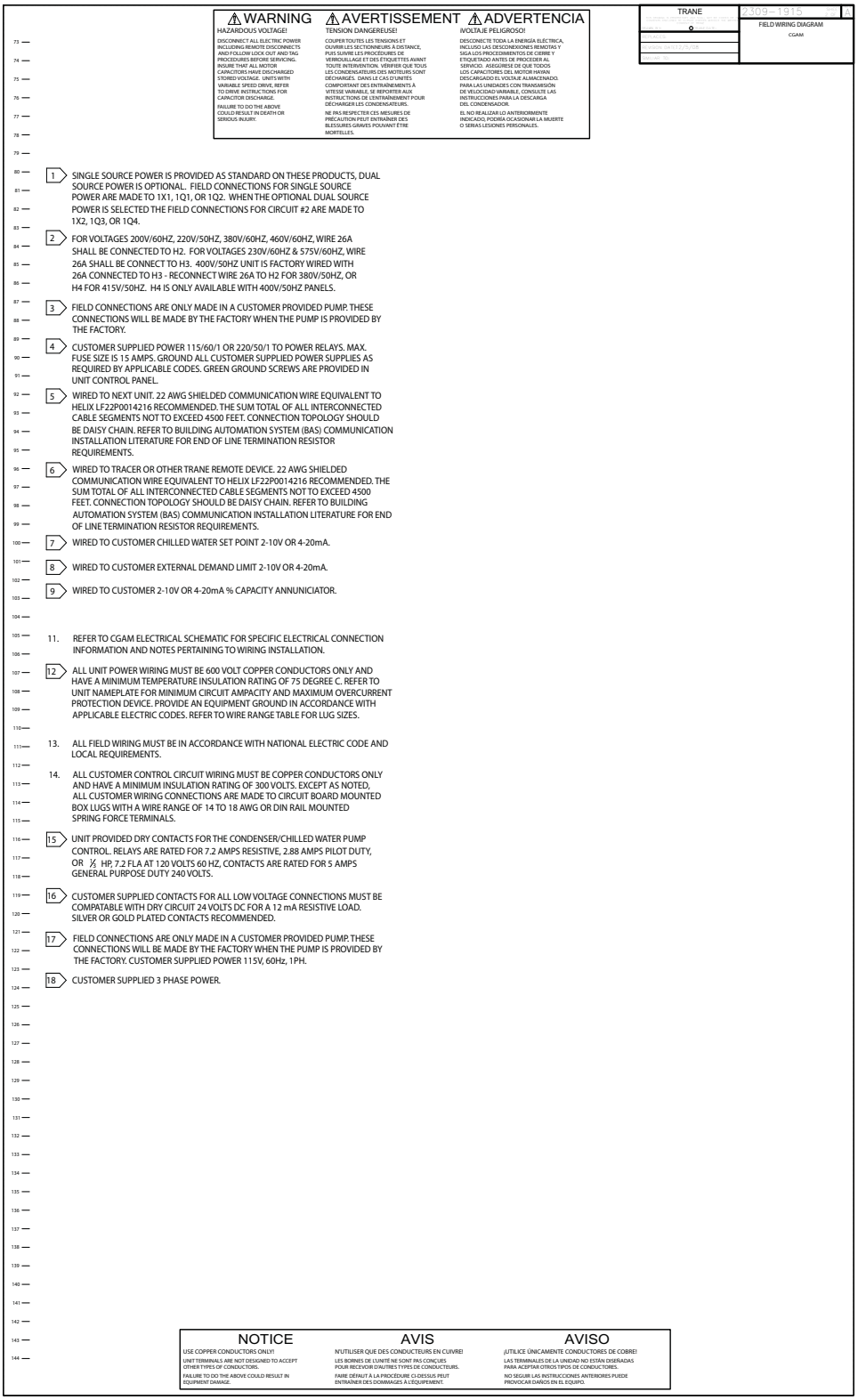
1. Optional circuit breaker and high fault circuit breaker.
2. Will accept two conduits per phase in this size.
3. Copper wire only, based on nameplate Minimum Circuit Ampacity (MCA).
4. Data shown for circuit one. The second circuit is always the same.
5. n/a - not available

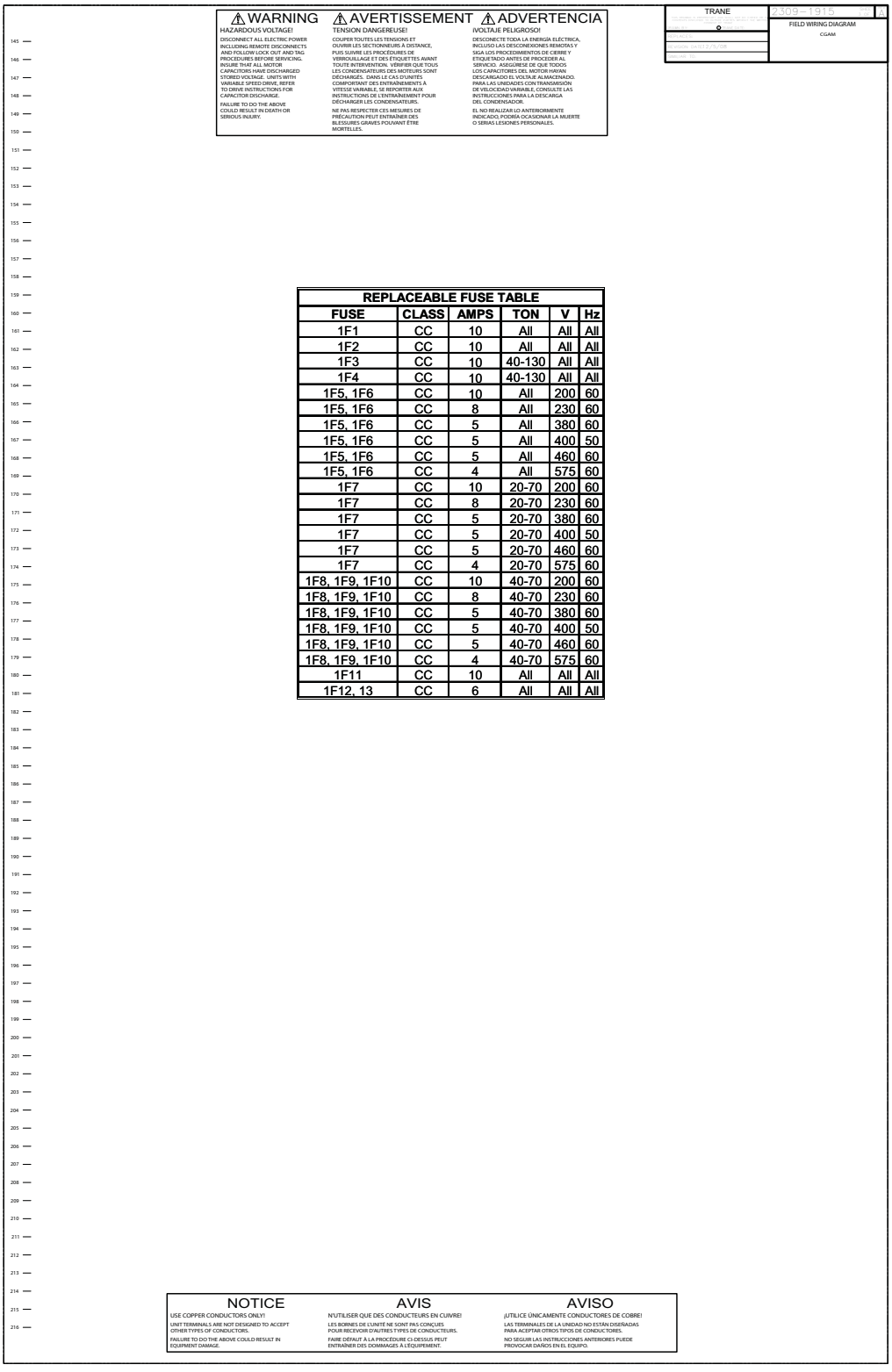
Electrical Connections




NOTICE
USE COPPER CONDUCTORS ONLY!
UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.
FAILURE TO DO THE ABOVE COULD RESULT IN EQUIPMENT DAMAGE
AVIS
N'UTILISER QUE DES CONDUCTEURS EN CUIVRE!
LES BORNES DE L'UNITE NE SONT PAS CONÇUES POUR RECEVOIR D'AUTRES TYPES DE CONDUCTEURS.
FAIRE DÉFAUT À LA PROCÉDURE CI DESSUS PEUT ENTRAÎNER DES DOMMAGES À L'ÉQUIPEMENT.
AVISO
¡ÚTILICE ÚNICAMENTE CONDUCTORES DE COBRE!
LAS TERMINALES DE LA UNIDAD NO ESTAN DISEÑADAS PARA ACEPTAR OTROS TIPOS DE CONDUCTORES.
NO SEGUIR LAS INSTRUCCIONES ANTERIORES PUEDE PROVOCAR DAÑOS EN EL EQUIPO.
NOTICE
TRANE PUMP CONTROL MUST BE USED TO PROVIDE PUMP CONTROL. CHILLED WATER PUMP MUST BE CONTROLLED BY THE CHILLER OUTPUT. FAILURE TO CONFIGURE THIS RELAY OUTPUT COULD RESULT IN DAMAGE TO THE UNIT.
CUSTOMER SUPPLIED PUMP
6M1
6M2
6Q1
6Q5
PHASE
A L1
B L2
C L3
CHILLED WATER PUMP FAULT INPUT
PUMP 1
PUMP 2
1X5-5
1X5-6
1X5-7
1X5-8
817
818
811
812
EMERGENCY STOP/ AUTO STOP
AUTO STOP
E-STOP
W2
W3
ICE MAKING CONTROL (OPTIONAL)
LCI-C
TO TRACER OR OTHER TRANE REMOTE DEVICE
TO NEXT UNIT
SHIELDED TWISTED PAIR LEADS
SHIELDED TWISTED PAIR LEADS
SETPOINT & DEMAND LIMIT (OPTIONAL)
INPUT
GND
INPUT
GND
1A9
DUAL RELAY OUTPUT EVAP WATER PUMP RELAYS RUN SIGNAL
PUMP 2
PUMP 1
1X4-29
1X4-30
1X4-31
1X4-32
535
536
538
540
PUMP STARTER COILS
ANALOG INPUT/OUTPUT CAPACITY OUTPUT (OPTIONAL)
1A25
4-20VDC
GND
6K10
6K11
6K12
6K13
6K14
6K15
6K6
6K5
6K4
6F2
6F1

Electrical Connections



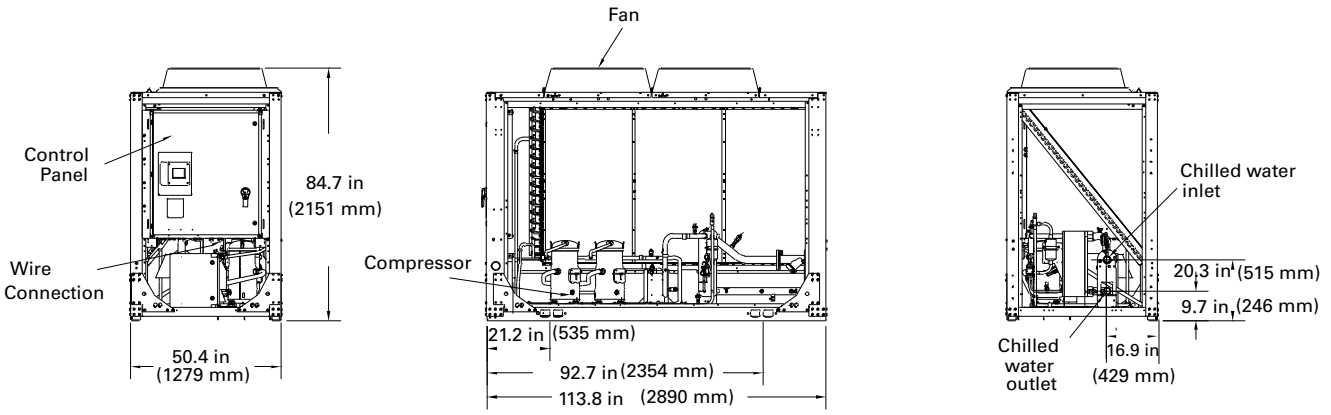


REPLACEABLE FUSE TABLE

FUSE	CLASS	AMPS	TON	V	Hz
1F1	CC	10	All	All	All
1F2	CC	10	All	All	All
1F3	CC	10	40-130	All	All
1F4	CC	10	40-130	All	All
1F5, 1F6	CC	10	All	200	60
1F5, 1F6	CC	8	All	230	60
1F5, 1F6	CC	5	All	380	60
1F5, 1F6	CC	5	All	400	50
1F5, 1F6	CC	5	All	460	60
1F5, 1F6	CC	4	All	575	60
1F7	CC	10	20-70	200	60
1F7	CC	8	20-70	230	60
1F7	CC	5	20-70	380	60
1F7	CC	5	20-70	400	50
1F7	CC	5	20-70	460	60
1F7	CC	4	20-70	575	60
1F8, 1F9, 1F10	CC	10	40-70	200	60
1F8, 1F9, 1F10	CC	8	40-70	230	60
1F8, 1F9, 1F10	CC	5	40-70	380	60
1F8, 1F9, 1F10	CC	5	40-70	400	50
1F8, 1F9, 1F10	CC	5	40-70	460	60
1F8, 1F9, 1F10	CC	4	40-70	575	60
1F11	CC	10	All	All	All
1F12, 13	CC	6	All	All	All

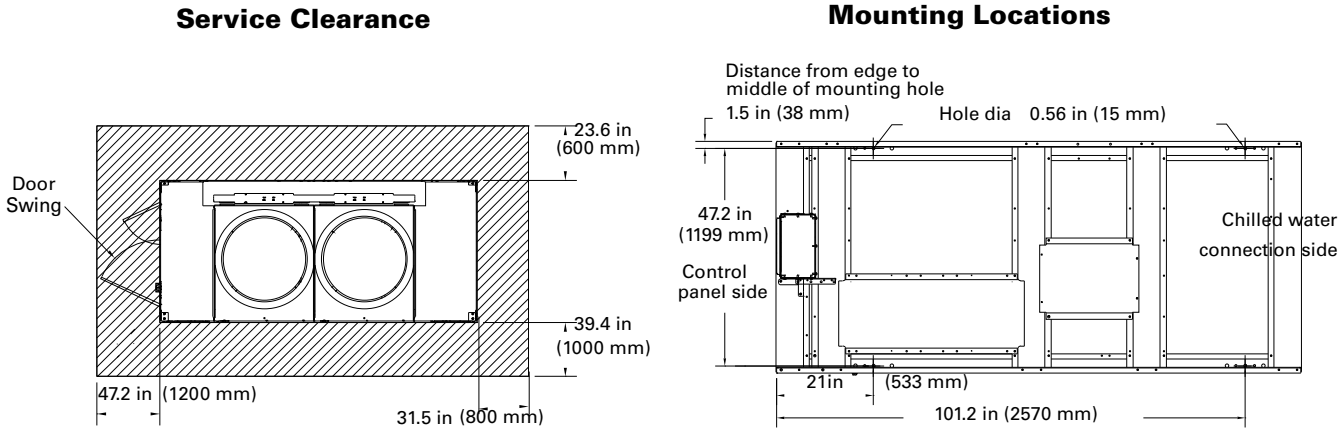
Dimensions

Figure 4. CGAM 20 and 26 ton



Water connections are 1.7 in (44 mm) from the end.

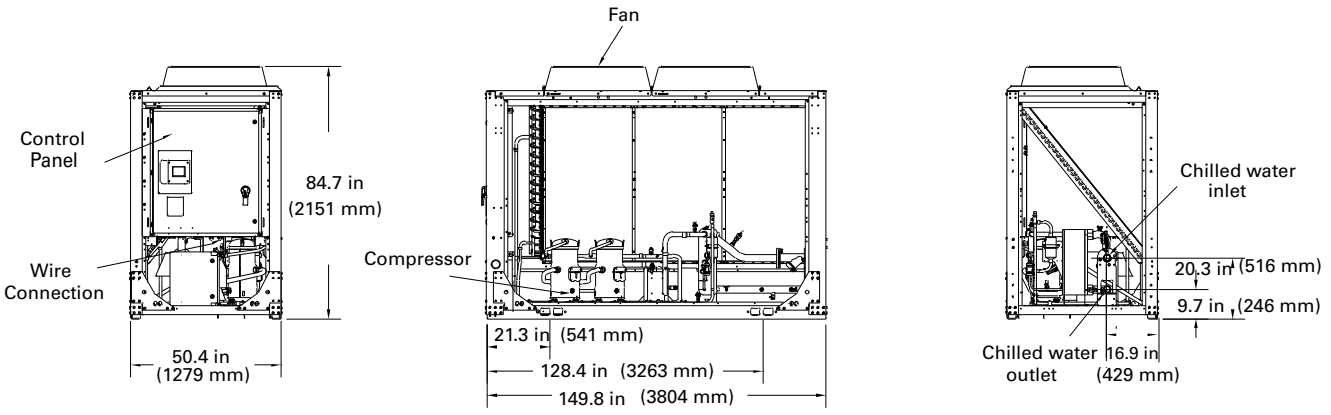
Figure 5. CGAM 20 and 26 ton - service clearances and mounting locations



More clearance may be needed for airflow depending on the installation.

Total of four mounting locations.

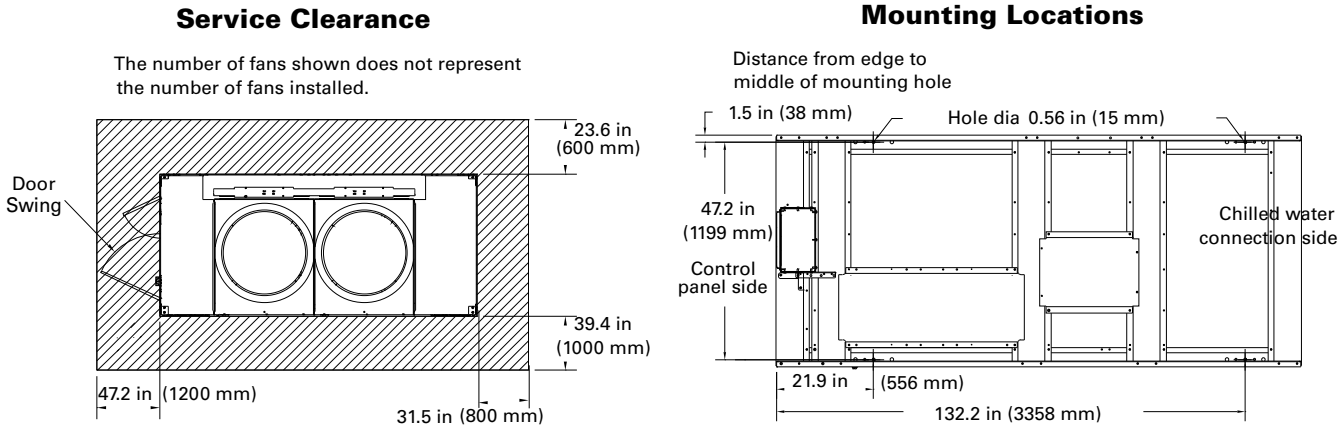
Figure 6. CGAM 30 and 35 ton



The number of fans shown does not represent the number of fans installed.

Water connections are 1.6 in (40 mm) from unit end.

Figure 7. CGAM 30 and 35 ton - service clearances and mounting locations

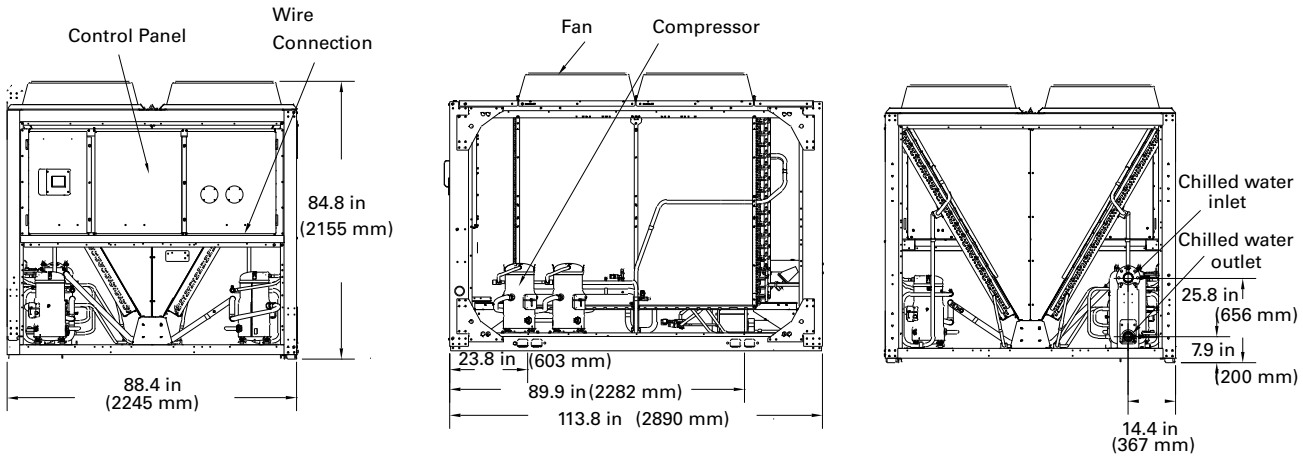


More clearance may be needed for airflow depending on the installation.

Total of four mounting locations.

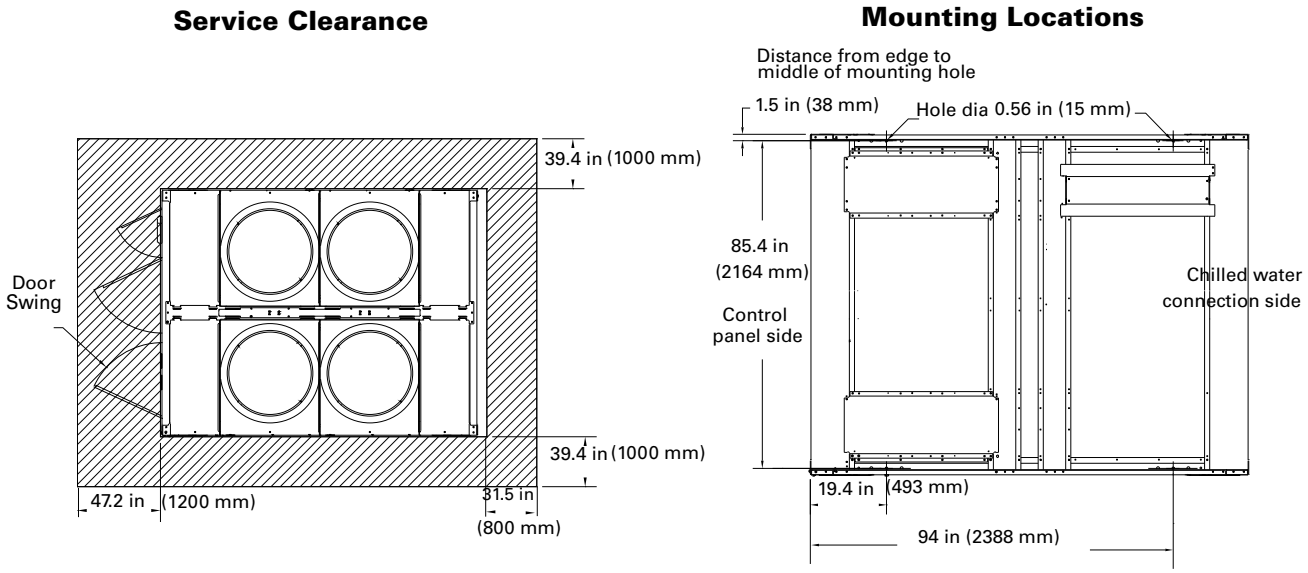
Dimensions

Figure 8. CGAM 40 and 52 ton



Water connections are even with unit end.

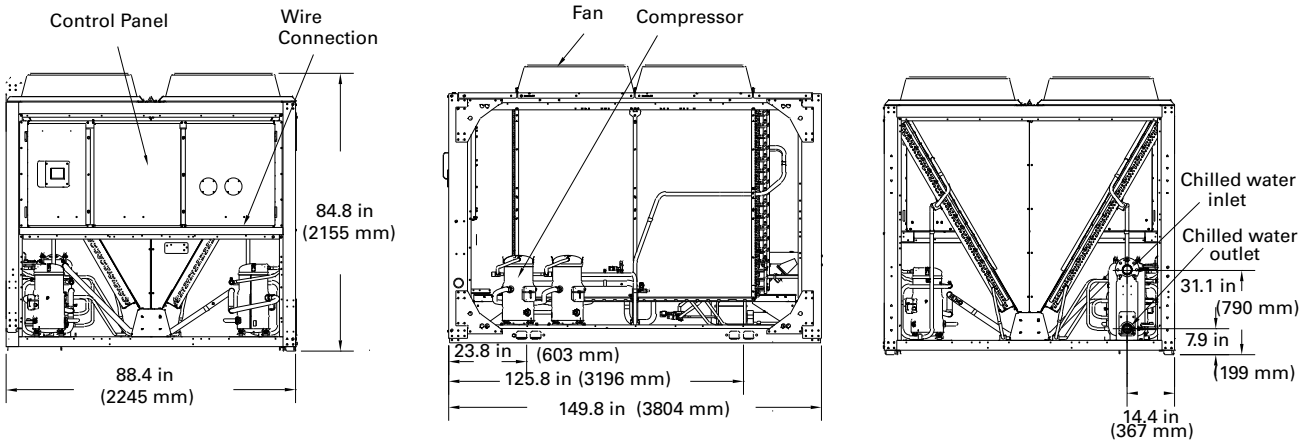
Figure 9. CGAM 40 and 52 ton- service clearances and mounting locations



More clearance may be needed for airflow depending on the installation.

Total of four mounting locations.

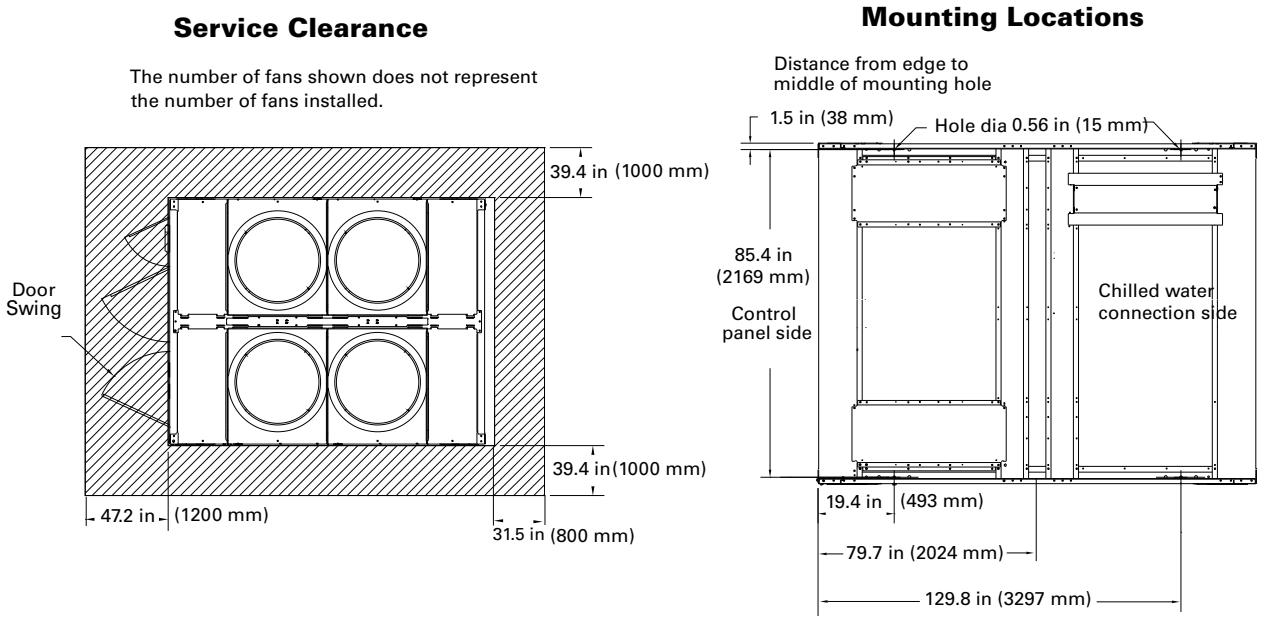
Figure 10. CGAM 60 and 70 ton



The number of fans shown does not represent the number of fans installed.

Water connections are even with unit end.

Figure 11. CGAM 60 and 70 ton - service clearances and mounting locations



More clearance may be needed for airflow depending on the installation.

Total of six mounting locations.

Dimensions

Figure 12. CGAM 80 and 90 ton

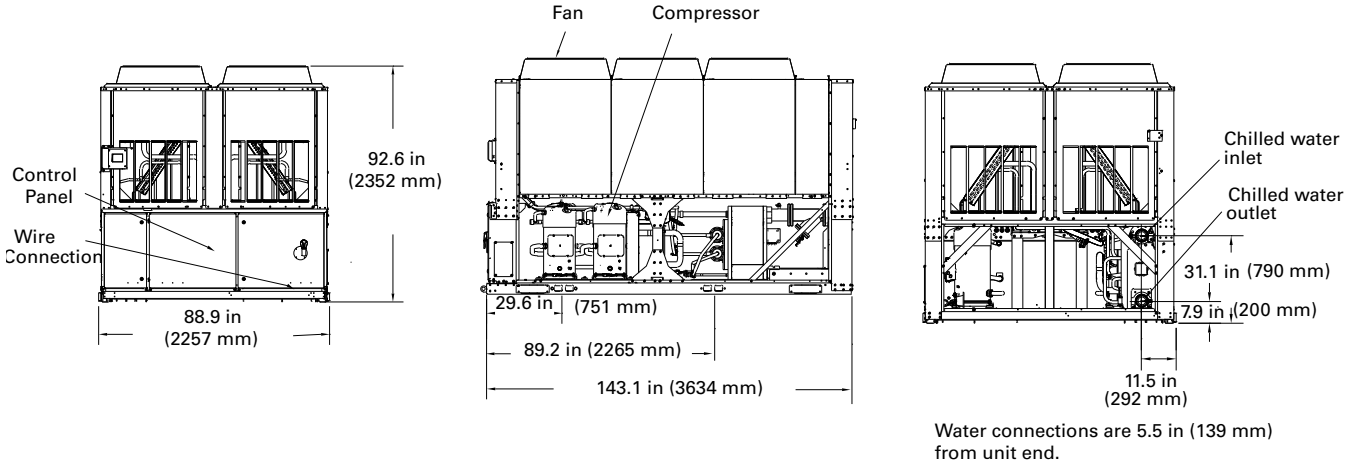


Figure 13. CGAM 80 and 90 ton - service clearances and mounting locations

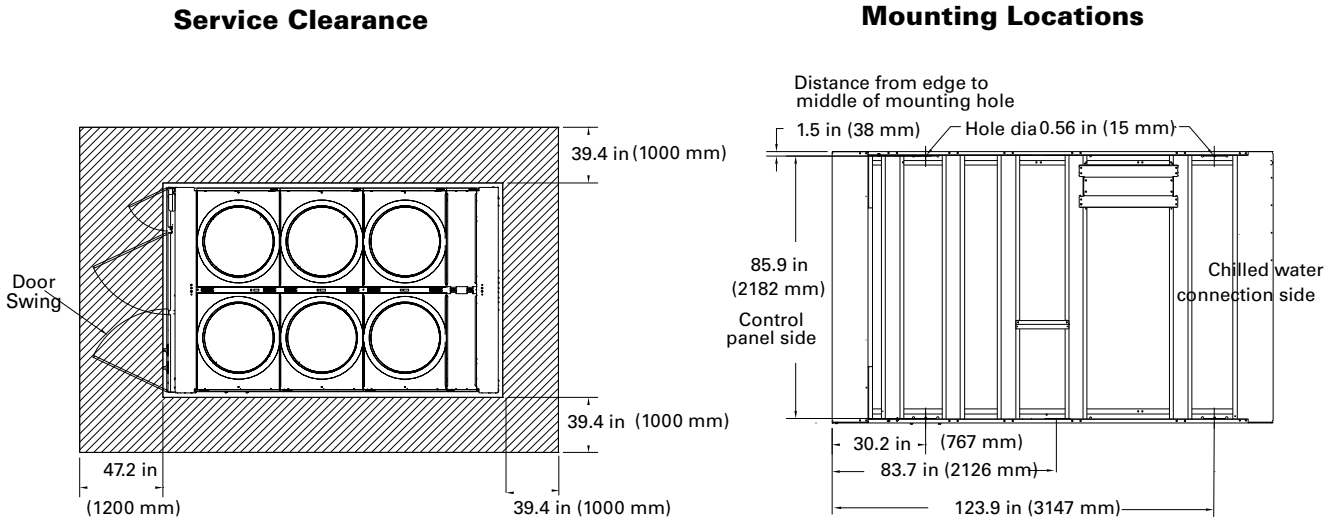
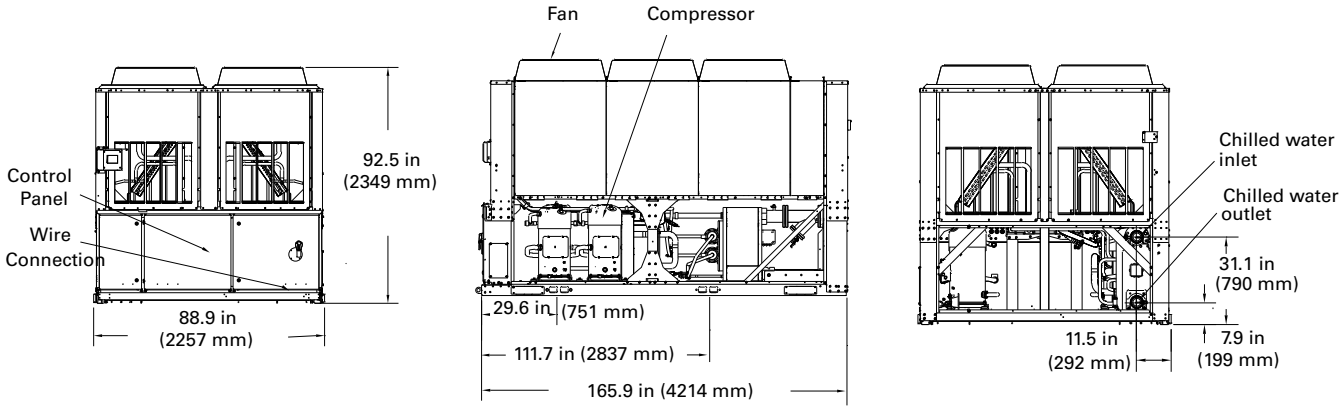


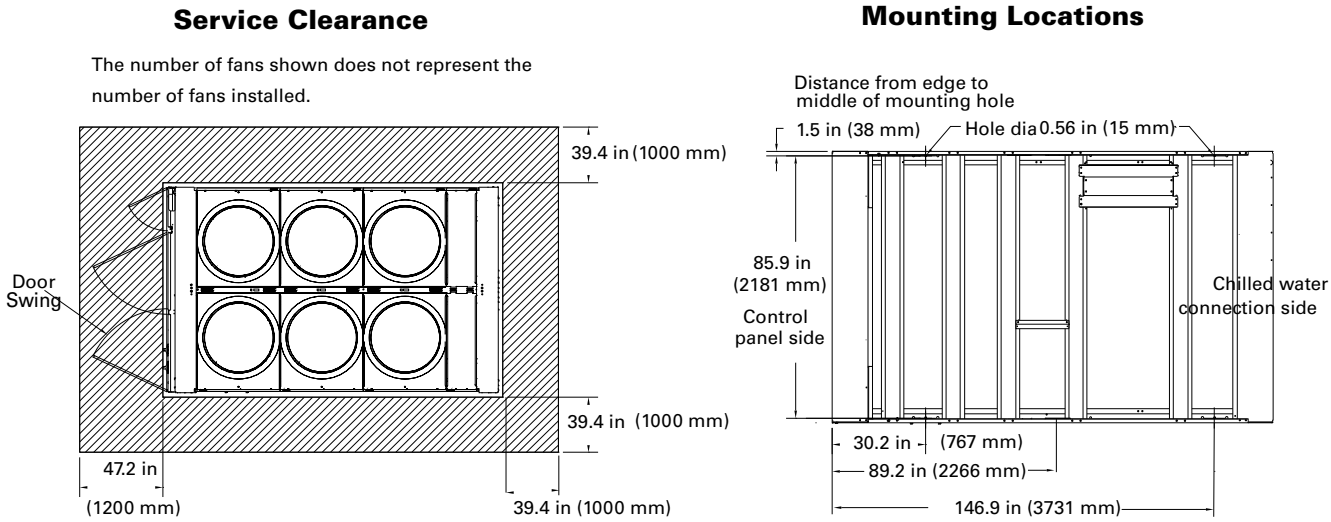
Figure 14. CGAM 100, 110 and 120 ton



The number of fans shown does not represent the number of fans installed.

Water connections are 5.4 in (139 mm) from unit end.

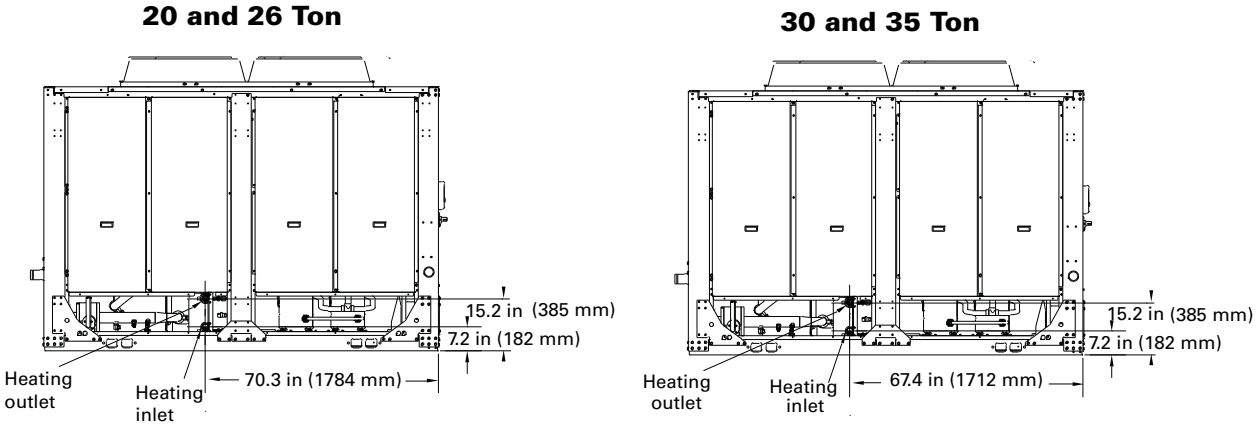
Figure 15. CGAM 100, 110 and 120 ton- service clearances and mounting locations



More clearance may be needed for airflow depending on the installation.

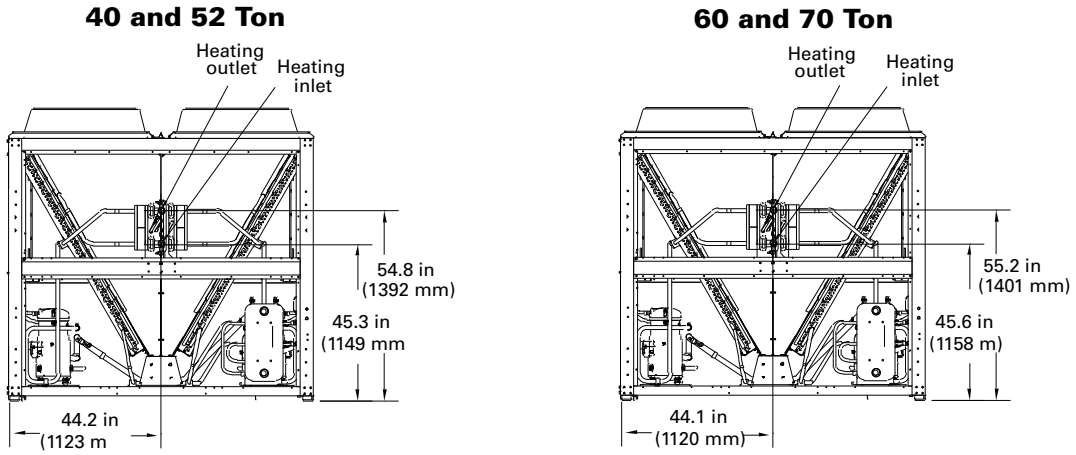
Total of six mounting locations.

Figure 16. Sizes 20 - 35 ton - Partial Heat Recovery - Water Connections



Partial heat recovery connections are even with the unit edge.
The number of fans shown does not represent the number of fans installed.

Figure 17. Sizes 40-70 ton - Partial Heat Recovery - Water Connections



Partial heat recovery connections are even with the unit edge.
The number of fans shown does not represent the number of fans installed.

Weights

Table 17. Weights - 60 Hz

Tons	Shipping Weight		Operating Weight	
	pounds	kilograms	pounds	kilograms
20	1967	892	2030	921
26	1995	905	2060	934
30	2561	1162	2629	1192
35	2580	1170	2654	1204
40	3507	1591	3578	1623
52	3584	1626	3666	1663
60	4640	2105	4730	2145
70	4656	2112	4751	2155
80	5278	2394	5384	2442
90	5637	2557	5746	2606
100	6283	2850	6401	2903
110	6328	2870	6461	2931
120	6328	2870	6461	2931

1. Weights based on aluminum fins.
2. Weights do not include louvers, partial heat recovery, etc.
3. All weights ±5%.

Table 18. Weights - 50 Hz

Tons	Shipping Weight		Operating Weight	
	pounds	kilograms	pounds	kilograms
20	1893	859	1955	887
26	1920	871	1985	900
30	2363	1072	2431	1103
35	2481	1125	2554	1158
40	3357	1523	3428	1555
52	3433	1557	3515	1594
60	4301	1951	4391	1992
70	4458	2022	4554	2066
80	5028	2281	5134	2329
90	5386	2443	5495	2492
100	5834	2646	5953	2700
110	6077	2756	6210	2817
120	6077	2756	6210	2817

1. Weights based on aluminum fins.
2. Weights do not include louvers, partial heat recovery, etc.
3. All weights ±5%.

Mechanical Specifications

General

Units are constructed of galvanized steel frame with galvanized steel panels and access doors. Component surfaces are finished with a powder-coated paint. Each unit ships with full operating charges of refrigerant and oil.

Compressor and Motor

The unit is equipped with two or more hermetic, direct-drive, 3600 rpm 60 Hz (3000 rpm 50 Hz) suction gas-cooled scroll compressors. The simple design has only three major moving parts and a completely enclosed compression chamber which leads to increased efficiency. Overload protection is internal to the compressors. The compressor includes: centrifugal oil pump, oil level sight glass and oil charging valve. Each compressor will have compressor heaters installed and properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles.

Unit-Mounted Starter

The control panel is designed per UL 1995. The starter is in across-the-line configuration, factory-mounted and fully pre-wired to the compressor motor and control panel. A factory-installed, factory-wired 820 VA control power transformer provides all unit control power (120 Vac secondary) and Trane CH530 module power (24 Vac secondary). Power line connection type is standard with a terminal block.

Evaporator

Braze plate heat exchanger is made of stainless steel with copper as the braze material. It is designed to withstand a refrigerant side working pressure of 430 psig (29.6 bars) and a waterside working pressure of 150 psig (10.5 bars). Evaporator is tested at 1.1 times maximum allowable refrigerant side working pressure and 1.5 times maximum allowable water side working pressure. It has one water pass. Immersion heaters protect the evaporator to an ambient of -20°F (-29°C).

The evaporator is covered with factory-installed 0.75 inch (19.05 mm) Armaflex II or equal (k=0.28) insulation. Foam insulation is used on the suction line. Water pipe extensions with insulation go from the evaporator to the edge of the unit.

Condenser

Air-cooled condenser coils have aluminum fins mechanically bonded to internally-finned copper tubing. The condenser coil has an integral subcooling circuit. The maximum allowable working pressure of the condenser is 650 psig (44.8 bars). Condensers are factory proof and leak tested at 715 psig (49.3 bars).

Direct-drive vertical discharge condenser fans are balanced. Three-phase condenser fan motors with permanently lubricated ball bearings and external thermal overload protection are provided.

Units start and operate from 0°F to 125°F (-18°C to 52°C).

Refrigerant Circuit and Capacity Modulation

The 20-35 ton units have single refrigerant circuits. The 40-120 ton units have dual refrigerant circuits. Each refrigerant circuit has Trane scroll compressors piped in parallel with a passive oil management system. A passive oil management system maintains proper oil levels within compressors and has no moving parts. Each refrigerant circuit includes filter drier, electronic expansion valve, and liquid line and discharge service valves .

Capacity modulation is achieved by turning compressors on and off. The 20-35 ton units have two capacity stages. The 40-120 ton units have four capacity stages.

Unit Controls (Trane CH530)

The microprocessor-based control panel is factory-installed and factory-tested. The control system is powered by a pre-wired control power transformer, and will turn on and off compressors to meet the load. Microprocessor-based chilled water reset based on return water is standard.

The Trane CH530 microprocessor automatically acts to prevent unit shutdown due to abnormal operating conditions associated with low evaporator refrigerant temperature and high condensing temperature. If an abnormal operating condition continues and the protective limit is reached, the machine will shut down.

The panel includes machine protection for the following conditions:

- Low evaporator refrigerant temperature and pressure
- High condenser refrigerant pressure
- Critical sensor or detection circuit faults
- High compressor discharge temperature (with low temp evaporator)
- Lost communication between modules
- Electrical distribution faults: phase loss, phase reversal or over temperature protection
- External and local emergency stop
- Loss of evaporator water flow

When a fault is detected, the control system conducts more than 100 diagnostic checks and displays results. The display will identify the fault, indicate date, time, and operating mode at time of occurrence, and provide type of reset required and a help message.

Clear Language Display Panel

Factory-mounted to the control panel door, the operator interface has an LCD touch-screen display for operator input and information output. This interface provides access to the following information: evaporator report, condenser report, compressor report, ASHRAE Guideline 3 report, operator settings, service settings, service tests, and diagnostics. All diagnostics and messages are displayed in "clear language."

Data contained in available reports includes:

- Water and air temperatures
- Refrigerant pressures and temperatures
- Flow switch status
- EXV position
- Compressor starts and run-time

All necessary settings and setpoints are programmed into the microprocessor-based controller via the operator interface. The controller is capable of receiving signals simultaneously from a variety of control sources, in any combination, and priority order of control sources can be programmed. The control source with priority determines active setpoints via the signal it sends to the control panel. Control sources may be:

- Local operator interface (standard)
- Hard-wired 4-20 mA or 2-10 Vdc signal from an external source (interface optional; control source not supplied)
- Time of day scheduling (optional capability available from local operator interface)
- LonTalk LCI-C (interface optional; control source not supplied)
- BACNet (interface optional; control source not supplied)
- Trane Tracer Summit system (interface optional; control source not supplied)

Quality Assurance

The quality management system applied by Trane has been subject to independent third-party assessment and approval to ISO 9001-2008. The products described in this catalog are designed, manufactured and tested in accordance with the approved system requirements described in the Trane Quality Manual.

Options

Application Options

Ice-Making with Hardwired Interface

Unit controls are factory set to handle ice-making for thermal storage application. This option allows for full load operation of the chiller with entering evaporator fluid temperature between 20°F (-7°C) and 65°F (18°C) with glycol.

Low-Temperature Processing

An additional temperature sensor, at the compressor discharge, enables leaving evaporator fluid temperature between 10°F (-12.2°C) and 42°F (5.5°C) with glycol.

Partial Heat Recovery with Fan Control

A supplemental brazed plate heat exchanger is mounted in series to the condenser coil. Connecting piping and inlet and outlet water sensors are included. CH530 controls display heat recovery inlet and outlet water temperatures and controls the fans. The heat rejection to the partial heat recovery heat exchanger is not controlled. Flow and temperature variations through the partial heat recovery heat exchanger will vary. The partial heat recovery heat exchanger is typically used to preheat water before it enters a boiler or other water heating process.

Electrical Options:

Circuit Breaker

A molded case standard interrupting capacity circuit breaker, factory pre-wired with terminal block power connections and equipped with a lockable external operator handle, is available to disconnect the chiller from main power.

Circuit Breaker with High Fault Rated Control Panel

A molded case high interrupting capacity circuit breaker, factory pre-wired with terminal block power connections and equipped with a lockable external operator handle, is available to disconnect the chiller from main power.

Dual Point Power Connection

Dual circuit machines (40-120 tons) are available with dual point power connections.

Control Options:

BACNet Interface

Allows user to easily interface with BACNet via a single twisted-pair wiring to a factory-installed and tested communication board.

LonTalk/Tracer Summit Interface

LonTalk (LCI-C) or Tracer Summit communications capabilities are available with communication link via single twisted-pair wiring to factory-installed and tested communication board. This option will support the functionality required to obtain Lon Mark certification.

Time of Day Scheduling

Time of day scheduling capabilities are available for scheduling single chiller applications through Trane CH530 panel (without the need for building automation system - BAS). This feature allows the user to set up to ten events in a seven day time period.

External Chilled Water and Demand Limit Setpoint

Controls, sensors, and safeties allow reset of chilled water temperature, based on temperature signal, during periods of low outdoor air temperature (chilled water reset based on return chilled water temperature is standard). The demand limit setpoint is communicated to a factory-installed and tested communication board through a 2-10 Vdc or 4-20 mA signal.

Percent Capacity

Output the number of compressors that are operating as an analog 2-10 Vdc or 4-20 mA signal.

Programmable Relays

Predefined, factory-installed, programmable relays allow the operation to select four relay outputs. Available outputs are: Alarm-Latching, Alarm-Auto Reset, General Alarm, Warning, Chiller Limit Mode, Compressor Running, and Tracer Control.

Other Options

Architectural Louvered Panels

Louvered panels cover the complete condensing coil and service area beneath the condenser.

Half Louvers

Louvered panels cover the condenser coil only. Available on the 80-120 ton units only.

CompleteCoat Condenser Coil

Allow for the operation in coastal environments. This option includes condenser coil box coating that resists bi-metallic corrosion.

Comprehensive Acoustic Package

This option includes acoustical treatment for compressor and refrigerant lines.

Isolators

Molded elastomeric isolators sized to reduce vibration transmission to the supporting structure when the unit is installed. Isolators ship with the chiller.

Insulation for High Humidity

The evaporator is covered with factory-installed 1.5 inch (38.1 mm) Armaflex II or equal (k=0.28) insulation. Foam insulation is used on the suction line.

Nitrogen Charge

Unit is shipped with oil and a nitrogen holding charge in lieu of refrigerant.

Performance Tests

Performance tests are available to certify chiller performance before shipment.

TRANE®

www.trane.com

For more information, contact your local Trane office or e-mail us at comfort@trane.com

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