Product Catalog

Air-Cooled Series R ™ Chillers Model RTAG XSE (50/60Hz)

March 2022

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Introduction

Trane RTAG-XSE, adopts the most advanced variable volume ratio screw compressor (with permanent magnet motor) and EC type condensing fan to provide industry-class energy efficiency at full load and part load. each compressor and fan motor has its individual variable speed drive, maximize savings in customer operating costs.

This premium product also offer.

Trane RTAG-XSE chiller offers high reliability with Trane helical-rotary compressor, Trane evaporator, smart controls, and copper tube/Al fin heat exchanger, etc.

Trane RTAG-XSE chiller offers the industry leading rapid restart option. It enables the chiller to restart optimization quickly after power outages, which is very important for the chiller reliability.

Trane RTAG-XSE chiller offers high static/high performance condensing fan, which allows higher chiller full load and part load efficiency and field installation of air ducts and fan diffusers to reduce noise levels.

The major advantages of the RTAG-XSE chiller are:
- Premium energy efficiency at full load and part load
- High reliabilities (Trane design/produce compressor/evaporator/coil/controller, etc.)
- Low sound level (Trane screw, EC fan and acoustic design optimization. low noise option with night setback and optimized compressor sound box)
- Full AFD drive, individual AFD for each compressor and condensing EC fan. which offers premium efficiency in the whole operating map and loading range
- Full permanent magnet motor, includes screw compressor and EC fan motor
- Copper tube/Aluminum fin coil, with better reliabilities
- Active harmonic filter (chiller built-in) option. automatically adjust the output according to the harmonic situation in the system to make the filtering effect better
- Up to 22 C cold water, which accurate/rapid temperature control
- High static condensing fan option, to enable filed installation of air duct and fan diffusers
- Smart controls and user-friendly interface
- Rapid restarts

The model RTAG-XSE chiller is an industrial-grade design, built for both the industrial and commercial markets.

Sound Levels
- Standard Noise
- Low Noise (compressor + tube sound attenuation)
- Low Noise + night noise setback

High static condensing fan option enables field installation of air duct and fan diffuser to reduce sound levels.

Table of Contents

Features and Benefits

The Helical-Rotary Compressor

AdaptiSpeed™ technology assures optimal performance at all operating conditions:
- Permanent magnet motor - up to 4% more efficient than an induction motor
- AFD Adaptive Frequency™ Drive

Soft start provided as standard to reduce power in-rush at start-up.

Available with Passive Harmonic Filtering achieving 5% TDD (optional).
- Variable volume ratio compressor design optimized for efficiency at all load conditions
- Rotor profile designed for maximum efficiency at higher speeds

Shuttle valve enhances compressor oil management.

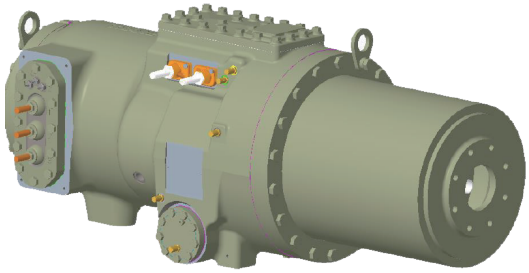


Figure 1 – Cutaway of a compressor

Capacity Control and Load Matching

The combination patented unloading system on Trane helical-rotary compressors for the majority of the unloading function. This allows the compressor to modulate infinitely, to exactly match building load and to maintain chilled-water supply temperatures within ± 0.3°C [±0.5°F] of the set point. Helical- rotary chillers that rely on stepped capacity control must run at a capacity equal to or greater than the load, and typically can only maintain water temperature to around ± 1°C [±2°F]. Much of this excess capacity is lost because overcooling goes toward removing building latent heat, causing the building to be dried beyond normal comfort requirements.

On RTAG-XSE, the combination of the adaptive frequency drive and EC fan allows the unit to accurately match building loads and achieve excellent efficiency at full and part loads.

Close Spacing Installation

The RTAG-XSE chiller has the tightest recommended side clearance in the industry, 1.2 meter, but that is not all. In situations where equipment must be installed with less clearance than recommended, which frequently occurs in retrofit applications, restricted airflow is common. Conventional chillers may not work at all. However, the RTAG-XSE chiller with the Adaptive Control™ microprocessor and EC fan will make as much chilled water as possible given the actual installed conditions, stay online during any unforeseen abnormal conditions, and optimize its performance. Consult your sales engineer for more details.

Factory Testing Means Trouble-Free Start-up

All RTAG-XSE chillers are given a complete functional test at the factory. This computer-based test program completely checks the sensors, wiring, electrical components, microprocessor function, communication capability, expansion valve performance, and fans. In addition, each compressor is run-tested to verify capacity and efficiency. Where applicable, each unit is factory preset to the customer's design conditions. An example would be the leaving-liquid temperature set point. The result of this test program is that the chiller arrives at the job site fully tested and ready for operation

Factory-Installed and Tested Controls and Options Speed Installation

All RTAG-XSE chiller options, including low ambient control, ambient temperature sensor, low ambient lockout, communication interface controls are factory installed and tested. Some manufacturers send accessories in pieces to be field installed. With Trane, the customer saves on installation expense and has assurance that ALL chiller controls and options have been tested and will function as expected.

CHIL Evaporator

Trane developed an evaporator specially designed for air-cooled chillers. CHIL evaporator optimizes the flow of the refrigerant to get an excellent heat exchange with water in every operating condition and minimize the quantity of refrigerant used.

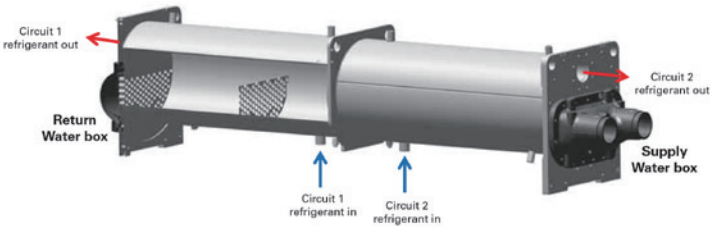


Figure 2 – CHIL Evaporator

Fans

RTAG-XSE chillers use EC fans in order to reduce power consumption at full load and at part load. EC fans allow a significant reduction of sound level and a better operation of the chiller at low ambient conditions.

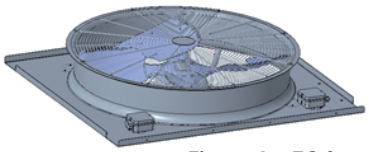


Figure 3 – EC fan

Condenser Coils

Air-cooled condenser coils have aluminum fins mechanically bonded to internally finned seamless copper tubing. Anti-corrosion option to ensure RTAG-XSE to be alive in serious conditions.

Superior Control with Symbio800™ Chiller Controls

The Adaptive Control™ microprocessor system enhances the RTAG-XSE chiller by providing the very latest chiller control technology. With the Adaptive Contro l microprocessor, unnecessary service calls and unhappy tenants are avoided. The unit does not nuisance-trip or unnecessarily shut down. Only when the Tracer chiller controls have exhausted all possible corrective actions and the unit is still violating an operating limit, will the chiller shut down. Controls on other equipment typically shut down the chiller, usually just when it is needed the most.

For Example:
A typical five-year-old chiller with dirty coils might trip out on high- pressure cutout on a 38°C [100°F] day in August. A hot day is just when comfort cooling is needed the most. In contrast, the RTAG-XSE chiller with an Adaptive Control microprocessor will stage fans on, modulate the electronic expansion valve, and modulate the slide valve as it approaches a high-pressure cutout, thereby keeping the chiller on line when you need it the most, on high ambient temperatures.

Options

Sound level options

Low noise
Low noise option of Sound Treatment use sound wrap to reduce the compressor, suction and discharge line, oil separator noise.
Low noise with night noise setback is implement with both sound wrap and variable speed fan, reduce fan speed to achieve even lower noise level in night time (can set between 0-24hrs).

Control options

Trane Symbio800 with improved Tracer® integration, connectivity, flexibility, serviceability, quality.
Embedded scheduling capability:
- Customizable for the application
- Expandable inputs and outputs

Ability to add custom sequences*
Open standard protocol communication
- BACnet® IP
- BACnet MS/TP
- BACnet over ZigBee® (Air-Fi® Wireless)
- LonTalk® (with additional hardware)
- Modbus® RTU, Modbus® TCP/IP

Rapid restart

RTAG has a soft configure item "Rapid Restart Enable". When it is configured as "Enable", the controller will start and upload the compressors as quickly as possible.

High static/high performance condensing fan

RTAG provides bigger size fans and motors, and the purpose is to:
- Allow field installation of air duct or fan diffuser to reduce noise levels.
- Provide higher capacity and efficiency.

Run test report

Run test report gives the results of the performance test of the unit in the design conditions specified in the order write up with water without glycol.

The data recorded are: cooling capacity, power input, air temperature, water entering temperature, water leaving temperature and water flow.
* Components may differ depending on unit model and size. Contact your local sales office for details.

Active harmonic filter

Automatically adjust the output according to the harmonic situation in the system to make the filtering effect better:
- AHF has better THDi performance than PHF
- AHF has smaller dimension than PHF, easier power wiring
- AHF can be used with one to one, or one to multi
- AHF can send out THDi data through Modbus link

Other Options

Condenser corrosion protection
Black fins are available on all size units for corrosion protection. Job site conditions should be matched with the appropriate condenser fin materials to prevent coil corrosion and ensure extended equipment life.

Allowable working pressure of the water box
150Psig and 300Psig options

Relief valves
Dual relief valve plus 3 way valve on low pressure side.

High performance insulation
Evaporator is insulated with 2 layers of Armaflex II or equivalent of 19 mm (3/4 inches) thickness and K factor of 0.26 W/m²°K.

Neoprene isolators
Isolators provide isolation between chiller and structure to help eliminate vibration transmission and have an efficiency of 95% minimum.

Power line connection types
- Circuit breaker
- Mech disconnect switch

Application Considerations

Important

Certain application constraints should be considered when sizing, selecting, and installing Trane RTAG-XSE chillers. Unit and system reliability is often dependent on properly and completely complying with these considerations. When the application varies from the guidelines presented, it should be reviewed with your local sales engineer.

Unit Sizing

Unit capacities are listed in the performance data section. Intentionally oversizing a unit to ensure 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 oversizing is desired, consider using two units.

Water Treatment

Dirt, scale, products of corrosion, and other foreign material will adversely affect heat transfer between the water and system components. Foreign matter in the chilled-water system can also increase pressure drop and, consequently, reduce water flow. Proper water treatment must be determined locally, depending on the type of system and local water characteristics. Neither salt nor brackish water is recommended for use in Trane RTAG-XSE chillers. Use of either will lead to a shortened chiller life. Trane encourages the employment of a reputable water-treatment specialist, familiar with local water conditions, to assist in this determination and in the establishment of a proper water- treatment program.

Effect of Altitude on Capacity

RTAG-XSE chiller capacities given in the performance data tables are for use at sea level. At elevations substantially above sea level, the decreased air density will reduce condenser capacity and, therefore, unit capacity and efficiency.

Ambient Limitations

Trane RTAG-XSE chillers are designed for year-round operation over a range of ambient temperatures. The RTAG-XSE chiller will operate in ambient temperatures of -20 to 46°C [-4 to 115°F]. Selecting the high-ambient option will allow the chiller to operate in ambient temperatures of 52°C [125°F], and selecting the low-ambient option will increase the operational capability of the water chiller to ambient temperatures as low as -20°C [-4°F] and selecting the wide ambient option will increase the operational capability of the water chiller to ambient temperatures as -20 to 52°C [-4 to 125°F]. For operation outside of these ranges, contact the local sales office.

Water Flow Limits

The minimum water flow rates are given in Tables 1. Evaporator flow rates below the tabulated values will result in laminar flow and cause freeze-up problems, scaling, stratification, and poor control.
The maximum evaporator water flow rate is also given in the general data section. Flow rates exceeding those listed may result in excessive tube erosion.

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 Model RTAG-XSE evaporator. A simple piping change can alleviate this problem. For example: a plastic injection molding process requires 5.0 l/s [80 gpm] of 10°C [50°F] water and returns that water at 15.6°C [60°F]. The selected chiller can operate at these temperatures, but has a minimum flow rate of 7.6 l/s [120 gpm]. The following system can satisfy the process.

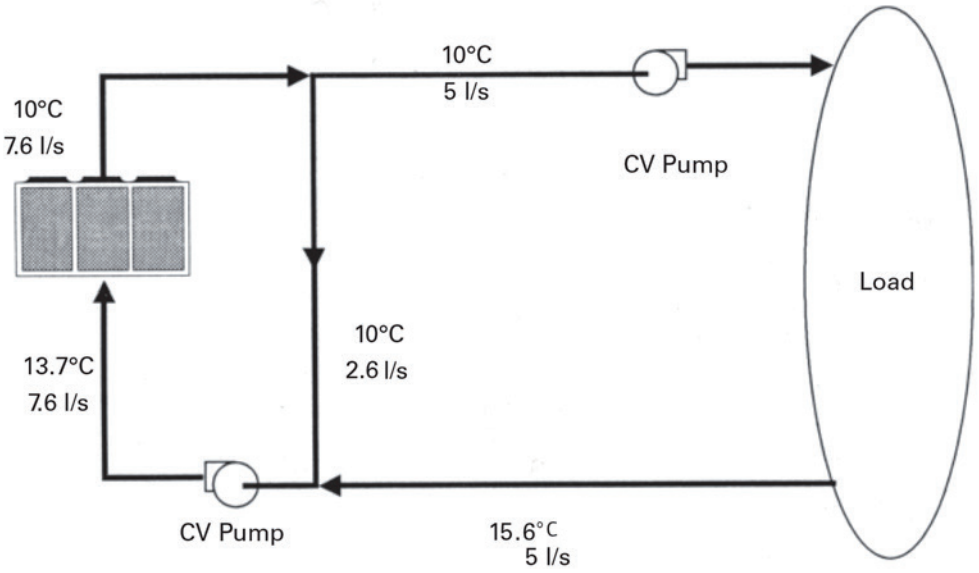


Figure 4 – Flow rate Out of Range

Flow Control

Trane requires the chilled water flow control in conjunction with the RTAG-XSE Chiller to be done by the chiller.
This will allow the chiller to protect itself in potentially harmful conditions.

Leaving-Water Temperature Limits

The standard leaving solution temperature range is 4 to 22°C [39 to 71.6°F]. Since liquid supply temperature set points less than 4°C [39°F] result in suction temperatures at or below the freezing point of water.

Leaving-Water Temperature

Out of Range
Many process cooling jobs require temperature ranges that cannot be met with the minimum and maximum published values. A simple piping change can alleviate this problem. For example: a laboratory load requires 7.6 l/s [120 gpm] of water entering the process at 29.4°C [85°F] and returning at 35°C [95°F]. The accuracy required is higher than the cooling tower can give. The selected chiller has adequate capacity, but has a maximum leaving-chilled-water temperature of 22°C [71.6°F]. In the example shown, both the chiller and process flow rates are equal. This is not necessary. For example, if the chiller had a higher flow rate, there would be more water bypassing and mixing with warm water.

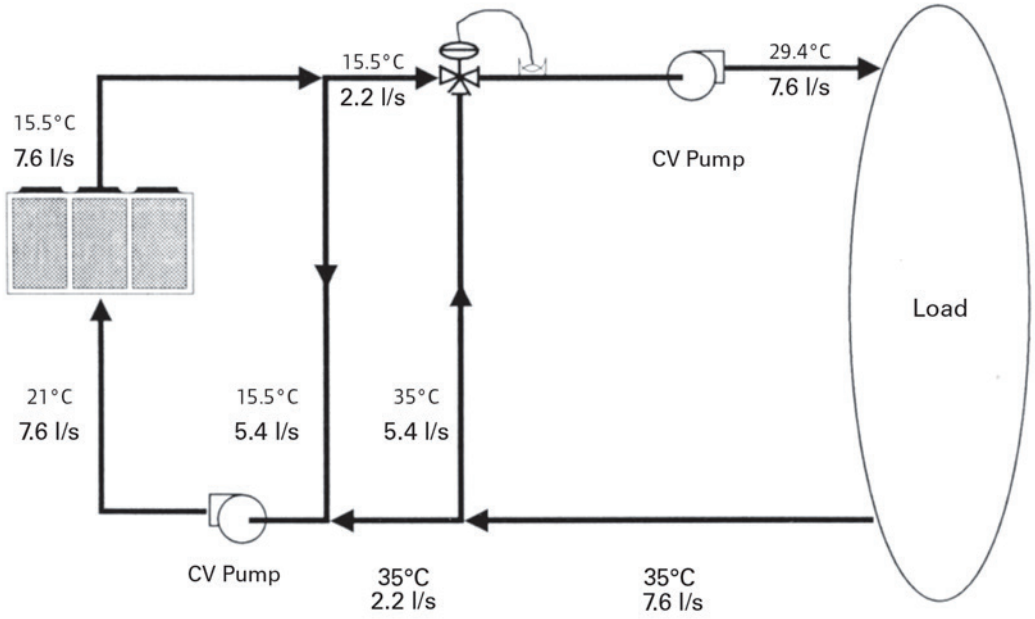


Figure 5 – Temperature Out of Range

Supply-Water Temperature Drop

The performance data for the Trane RTAG-XSE chiller is based on a chilled-water temperature drop of 5.6°C [10°F]. Chilled-water temperature drops from 3.3 to 10°C [38 to 50°F] may be used as long as minimum and maximum water temperature, and minimum and maximum flow rates, is not violated. Temperature drops outside this range are beyond the optimum range for control, and may adversely affect the microcomputer's ability to maintain an acceptable supply-water temperature range. When temperature drops are less than 3.3°C [38°F], an evaporator runaround loop may be required.

Short Water Loops

The proper location of the temperature control sensor is in the supply (outlet) water connection or pipe. This location allows the building to act as a buffer and assures a slowly-changing return-water temperature. If there is not a sufficient volume of water in the system to provide an adequate buffer, temperature control can be lost, resulting in erratic system operation and excessive compressor cycling. A short water loop has the same effect as attempting to control using the building return water. Typically, a two-minute water loop is sufficient to prevent a short water loop. Therefore, as a guideline, ensure that the volume of water in the evaporator loop equals or exceeds two times the evaporator flow rate per minute. For a rapidly changing load profile, the amount of volume should be increased. To prevent the effect of a short water loop, the following item should be given careful consideration: a storage tank or larger header pipe to increase the volume of water in the system and, therefore, reduce the rate of change of the return water temperature.

Application Types

- Comfort cooling
- Industrial process cooling

Model Number Descriptions

R	T	A	G	2	7	5	C	C	A	0	E	0	C	S	N	D	X	F	N	L	1	S	T	X	X	X	C	X	X	X	F	R	V	0	C	1	A	N	X	X
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

Digit 1-4 - Unit Model
RTAG = Air Cooled Series chiller

Digit 5-7 - Unit Nominal Tons
205 = 205 Nominal Tons
275 = 275 Nominal Tons
340 = 340 Nominal Tons

Digit 08 - Unit Voltage
C = 380V/50Hz/3Ph
D = 400V/50Hz/3Ph
6 = 415V/50Hz/3Ph
E = 380V/60Hz/3Ph

Digit 09 - Manufacturing Location
C = Taicang, China

Digit 10, 11 - Design Sequence
XX-Factory/ABU Assigned

Digit 12 - Unit Type
E = Extra Seasonnal Efficiency

Digit 13 - Safety Agency Listing
N = No Safety Agency Listing

Digit 14 - Pressure Vessel Code
A = ASME Pressure Vessel Code
C = Chinese Pressure Vessel Code

Digit 15 - Sound Treatment
S = Standard
L = Low Noise
N = Low Noise+Night Noise Setback

Digit 16 - Unit Application
N= Standard Ambient -4-114.8°F (-20-46℃)
H= High Ambient -4-125.6°F (-20-52℃)

Digit 17 - Relief Valve Option
S = Single Relief Valve
D = Dual Relief Valve With 3 Way Valve

Digit 18 - Flow Switch
X = No Flow Switch
F = Field Installed Flow Switch

Digit 19 - Water Connection
F = Flange

Digit 20 - Evaporator Application
N = Standard Cooling (4-22℃)

Digit 21 - Evaporator Water Pressure
L = 150psi
H = 300psi

Digit 22 - Evaporator Configurations
2 = 2 Pass Evaporator
1 = 1 Pass Evaporator

Digit 23 - Thermal Insulation
S = Standard Thermal Insulation
D = Extra Thick Thermal Insulation

Digit 24 - Condenser Options
T = Copper tube/Al fin coil
B = Copper tube/Al fin coil, w black coated
E = Copper tube/Al fin coil, w/epoxy coated

Digit 25 - Heat Recovery
X = No Heat Recovery

Digit 26 - Pump Package
X = Pump Signal On/Off

Digit 27 - Free Cooling
X = None

Digit 28 - Unit Operator Interface Language
C = Chinese
E = English

Digit 29 - Remote Communications Options
X = None
M= LonTalk Interface
B = Bacnet Interface
L = Modbus Interface

Digit 30 - Rapid Restart
X = None
S = Rapid Restart-No UPS
U = Rapid Restart-With UPS

Digit 31 - External Set Points & Capacity Outputs
X = None
A = External Set Points & Capacity Outputs

Digit 32 - Refrigerant Type
F = R134a

Digit 33 - Factory Tests
R = Standard Functional Test
P = Non-witnessed Performance Test, With Report
W = Customer-witnessed Performance Test, With Report

Digit 34 - Compressor Motor Starter Type
V = VFD

Digit 35 - Harmonic Filter
0 = None
1 = With Harmonic Filter

Digit 36 - Power Line Connection Type
C = Circuit Breaker
D = Mech Disconnect Switch

Digit 37 - Incoming Power Line
1 = Single Point Power Connection

Digit 38 - Control Output Accessories Options
A = Programmable Status Relays

Digit 39 - Appearance Options
N = No Appearance Options

Digit 40 - Unit Isolation Installation Accessory
N = None
R = Neoprene Isolators

Digit 41- High Static Pressure Option
X = None
H = High Static Pressure(50-150Pa)

Unit General Data

Table 1 General data—205-340 Ton Extra Seasonnal Efficiency Unit

model		RTAG	205	275	340
Refrigant		-	R134a		
Compressor	Type	-	Permanent magnet VVI horizontal semienclosed screw compressor		
	Starter	-	VFD		
	Circuits	-	2	2	2
	Min load	%	15%	15%	15%
	RLA of Compressor 1A	A	200	200	350
	RLA of Compressor 2A	A	200	350	350
Evaporator	Type	-	Shell & Tube (CHIL Evap)		
	Rating flow	gpm	552	737	908
	Rating WPD	psid	4.86	6.87	8.22
	Min flow	gpm	317	323	368
	Max flow	gpm	1268	1290	1471
	Water storage	lb	1157	1179	1345
	Tube size	inch	6″	6″	6″
Air cooled heat exchanger	Fan type	-	Horizontal axial flow		
	Quantity	-	14	16	18
	power	kW/per	1.8		
	Fan speed	RPM	950/300		
	Single fan Airflow	CFM	12360		
	Unit start current	A	400	550	700
	Max RLA	A	517	696	875
Refrigrant charge	ckt 1	Lb	231	236	291
	ckt 2	Lb	231	315	291
Oil charge	ckt 1	gal	3.4	3.4	4.0
	ckt 2	gal	3.4	4.0	4.0
Dimension	Length	inch	345	392	438
	width	inch	89	89	89
	height	inch	98	98	98
	Shipping weight	lb	13038	14771	16336
	Operation weight	lb	14716	16563	18329

Note:

1. Electric type could selected according unit voltage but the current value in table is based on 380V/50HZ/3Ph.

Controls System

Tracer Symbio800 Controller

Today's RTAG chillers offer predictive controls that anticipate and compensate for load changes.

Feedforward Adaptive Control

Feedforward is an open-loop, predictive control strategy designed to anticipate and compensate for load changes. It uses evaporator entering-water temperature as an indication of load change. This allows the controller to respond faster and maintain stable leaving-water temperatures.

Soft Loading

The chiller controller uses soft loading except during manual operation. Large adjustments due to load or setpoint changes are made gradually, preventing the compressor from cycling unnecessarily. It does this by internally filtering the setpoints to avoid reaching the differential-to-stop or the demand limit. Soft loading applies to the leaving chilled-water temperature and demand limit setpoints.

Adaptive Controls

There are many objectives that the controller must meet, but it cannot satisfy more than one objective at a time. Typically, the controllers primary objective is to maintain the evaporator leaving water temperature. Whenever the controller senses that it can no longer meet its primary objective without triggering a protective shutdown, it focuses on the most critical secondary objective. When the secondary objective is no longer critical, the controller reverts to its primary objective.

AdaptiSpeed Control

The speed control is now optimized mathematically and controlled simultaneously. The increased performance of the Symbio800 Controller allows the chiller to operate longer at higher efficiency, and with greater stability.

Variable-Primary Flow (VPF)

Chilled-water systems that vary the water flow through chiller evaporators have caught the attention of engineers, contractors, building owners, and operators. Varying the water flow reduces the energy consumed by pumps, while having limited effect on the chiller energy consumption. This strategy can be a significant source of energy savings, depending on the application.

TD7 Operator Interface

The standard TD7 display provided with the Trane Symbio800 controller features a 7" LCD touch-screen, allowing access to all operational inputs and outputs. This is an advanced interface that allows the user to access any important information concerning setpoints, active temperatures, modes, electrical data, pressure, and diagnostics.

Display Features Include:

- Factory-mounted above the control panel door
- UV Resistant touchscreen
- -40°C to 70°C Operating temperature

Display Features Include:

- Factory-mounted above the control panel door
- UV Resistant touchscreen
- -40°C to 70°C Operating temperature
- IP56 rated
- CE marking
- Emissions: EN55011(Class B)
- Immunity: EN61000(Industrial)
- 7" diagonal
- 800x480 pixels
- TFT LCD @ 600 nits brightness
- 16 bit color graphic display
- Display features:
  - Alarms
  - Reports
  - Chiller settings
  - Display settings
  - Graphing
  - Support 15 languages

Figure 6 – TD7 operator interface

TracerTU Interface

TracerTU (non-Trane personnel, contact your local Trane office for software) adds a level of sophistication that improves service technician effectiveness and minimizes chiller downtime. The portable PC-based service-tool software, TracerTU, supports service and maintenance tasks. TracerTU serves as a common interface to all Trane® chillers, and will customize itself based on the properties of the chiller with which it is communicating. Thus, the service technician learns only one service interface. The panel bus is easy to troubleshoot using LED sensor verification. Only the defective device is replaced. TracerTU can communicate with individual devices or groups of devices. All chiller status, machine configuration settings, customizable limits, and up to 100 active or historic diagnostics are displayed through the service-tool software interface. LEDs and their respective TracerTU indicators visually confirm the availability of each connected sensor, relay, and actuator.

TracerTU is designed to run on a customer's laptop, connected to the Tracer TD7 control panel with a USB cable. Your laptop must meet the following hardware and software requirements:

- 1 GB RAM (minimum)
- 1024 x 768 screen resolution
- CD-ROM drive
- Ethernet 10/100 LAN card
- An available USB 2.0 port
- Microsoft® Windows® XP Professional operation system with Service Pack 3 (SP3) or Windows 7 Enterprise or Professional operating system (32-bit or 64-bit)
- Microsoft .NET Framework 4.0 or later

Note: TracerTU is designed and validated for this minimum laptop configuration. Any variation from this configuration may have different results. Therefore, support for TracerTU is limited to only those laptops with the configuration previously specified.

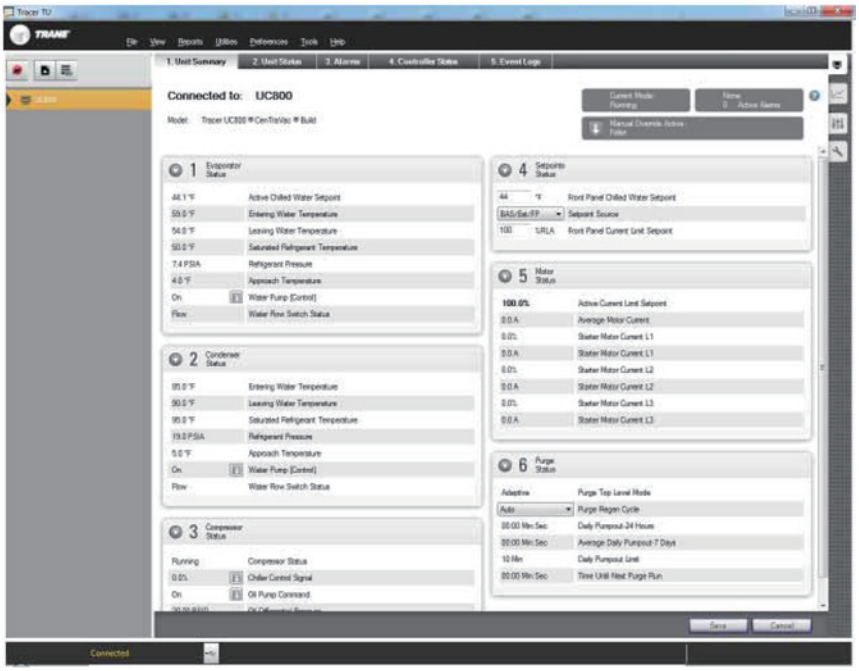


Figure 7 – TracerTU interface

System Integration

Stand-Alone Controls

Single chillers installed in applications without a building management system are 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 requires a manual reset of the unit microcomputer. This closure is typically triggered by a job-site provided system such as a fire alarm.

Hardwire Points

Microcomputer controls allow simple interface with other control systems, such as time clocks, building automation 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 V dc signal, or by utilizing contact closures. This setup has the same 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
- Tracer TD7 control can be configured for BACnet communications at the factory or in the field. This enables the chiller controller to communicate on a BACnet MS/TP network. Chiller setpoints, operating modes, alarms, and status can be monitored and controlled through BACnet. Tracer TD7 controls conforms to the BACnet B-ASC profile as defined by ASHRAE 135-2004.

- Lon Talk Communications Interface (LCI-C)
- The optional Lon Talk® Communications Interface for Chillers (LCI-C) is available factory or field installed. It is an integrated communication board that enables the chiller controller to communicate over a LonTalk network. The LCI-C is capable of controlling and monitoring chiller setpoints, operating modes, alarms, and status. The Trane LCI-C provides additional points beyond the standard LONMARK® defined chiller profile to extend interoperability and support a broader range of system applications. These added points are referred to as open extensions. The LCI-C is certified to the LONMARK Chiller Controller Functional Profile 8040 version 1.0, and follows LonTalk FTT-10A free topology communications.

Modbus Interface Tracer TD7 control can be configured for Modbus communications at the factory or in the field. This enables the chiller controller to communicate as a slave device on a Modbus network. Chiller setpoints, operating modes, alarms, and status can be monitored and controlled by a Modbus master device.

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 RTAG 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)
- 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.

Tracer SC

The Tracer SC™ system controller acts as the central coordinator for all individual equipment devices on a Tracer building automation system. The Tracer SC scans all unit controllers to update information and coordinate building control, including building subsystems such as VAV and chiller water systems. With this system option, the full breadth of Trane's HVAC and controls experience are applied to offer solutions to many facility issues. The LAN allows building operators to manage these varied components as one system from any personal computer with web access.

The benefits of this system are:

- Improved usability with automatic data collection, enhanced data logging, easier to create graphics, simpler navigation, pre-programmed scheduling, reporting, and alarm logs.
- Flexible technology allows for system sizes from 30-120 unit controllers with any combination of LonTalk or BACnet unit controllers.
- LEED certification through site commissioning report, energy data collection measurement, optimizing energy performance, and maintaining indoor air quality.

Energy savings programs include: fan pressure optimization, ventilation reset, and chiller plant control (adds and subtracts chillers to meet cooling loads).

Building Automation and Chiller Plant Control

The Symbio800 controller can communicate with Trane Tracer Summit, Tracer SC and Tracer ES building automation systems, which include pre-engineered and flexible control for chiller plants. These building automation systems can control the operation of the complete installation: chillers, pumps, isolating valves, air handlers, and terminal units.

Trane can undertake full responsibility for optimized automation and energy management for the entire chiller plant.
The main functions are:
- **Chiller sequencing:** equalizes the number of running hours of the chillers. Different control strategies are available depending on the configuration of the installation.
- **Control of the auxiliaries:** includes input/output modules to control the operation of the various auxiliary equipment (water pumps, valves, etc.).
- **Time-of-day scheduling:** allows the end user to define the occupancy period, for example: time of the day, holiday periods and exception schedules.
- **Optimization of the installation start/stop time:** based on the programmed schedule of occupancy and the historical temperature records. Tracer Summit and Tracer SC calculate the optimal start/stop time of the installation to get the best compromise between energy savings and comfort of the occupants.
- **Soft loading:** the soft loading function minimizes the number of chillers that are operated to satisfy a large chilled-water-loop pull down, thus preventing an overshoot of the actual capacity required. Unnecessary starts are avoided and the peak current demand is lowered.
- **Communication capabilities:** local, through a PC workstation keyboard. Tracer Summit and Tracer SC can be programmed to send messages to other local or remote workstations and or a pager in the following cases:
- Analog parameter exceeding a programmed value
- Maintenance warning
- Component failure alarm
- Critical alarm messages. In this latter case, the message is displayed until the operator acknowledges the receipt of the information. From the remote station it is also possible to access and modify the chiller plants control parameters.

Remote communication through a modem: as an option, a modem can be connected to communicate the plant operation parameters through voice grade phone lines. A remote terminal is a PC workstation equipped with a modem and software to display the remote plant parameters.

Integrated Comfort System (ICS)
The onboard Tracer chiller controller is designed to be able to communicate with a wide range of building automation systems. In order to take full advantage of chiller's capabilities, incorporate your chiller into a Tracer Summit or Tracer SC building automation system. But the benefits do not stop at the chiller plant. At Trane, we realize that all the energy used in your cooling system is important. That is why we worked closely with other equipment manufacturers to predict the energy required by the entire system. We used this information to create patented control logic for optimizing HVAC system efficiency. The building owners challenge is to tie components and applications expertise into a single reliable system that provides maximum comfort, control, and efficiency. Trane Integrated Comfort systems (ICS) are a concept that combines system components, controls, and engineering applications expertise into a single, logical, and efficient system. These advanced controls are fully commissioned and available on every piece of Trane® equipment, from the largest chiller to the smallest VAV box. As a manufacturer, only Trane offers this universe of equipment, controls, and factory installation and verification.

Electrical Data

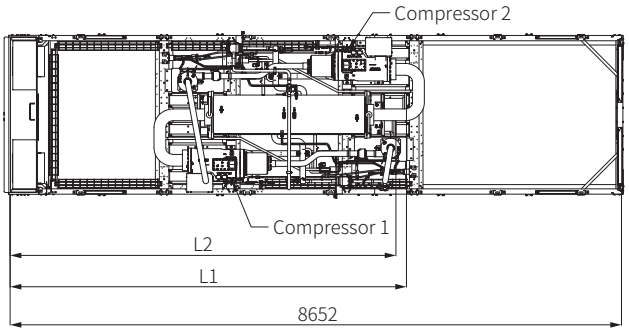
Electrical data – at all ambient operation

Unit Size	Rated Voltage	Motor Data						
		Power Conns	Compressor（Each）			Fan（Each）		
			Qty.	RLA Ckt1/ Ckt2	Max RLA Ckt1/ Ckt2	Qty. Ckt1/ Ckt2	kW	FLA
205	380/50/3	1	2	200/200	240/240	7/7	1.8	4
275	380/50/3	1	2	200/350	240/420	6/10	1.8	4
340	380/50/3	1	2	350/350	420/420	9/9	1.8	4

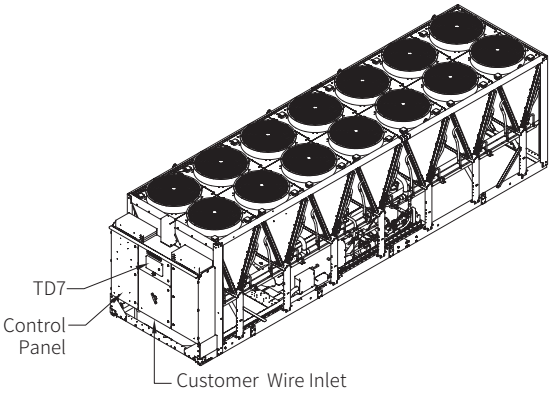
Notes:
1. RLA-Rated load amps.
2. Voltage range:380V/400V/415V/50Hz/60Hz/3 Application range: 342~418V/360~440V/374~457V/50~60HZ/3.
3. Customer need to provide an isolated power 220V/50Hz/1 to heat the evaporator. There are 4 heaters for 250XSE, heater total power is 1500W, and 6 heaters for 275XSE and 340XSE, heaters total power is 2430W.

Dimensional Data

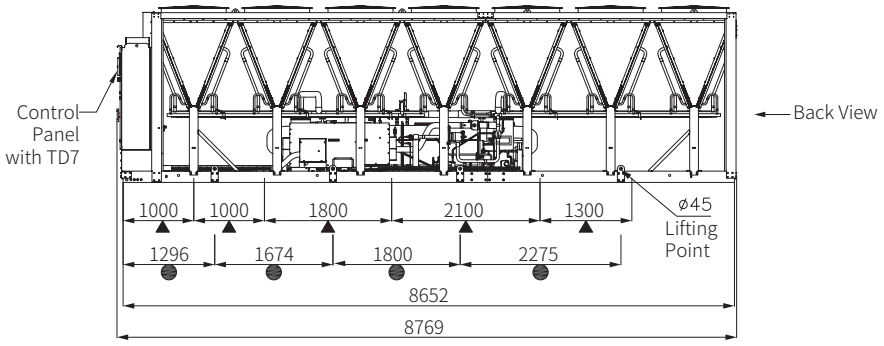
RTAG XSE 205



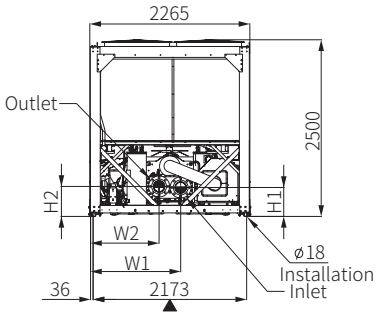
Top View(Coil Condenser Hidden)



ISO View



Side View

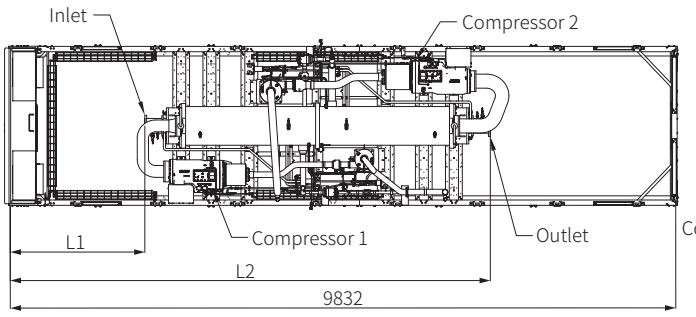


Back View

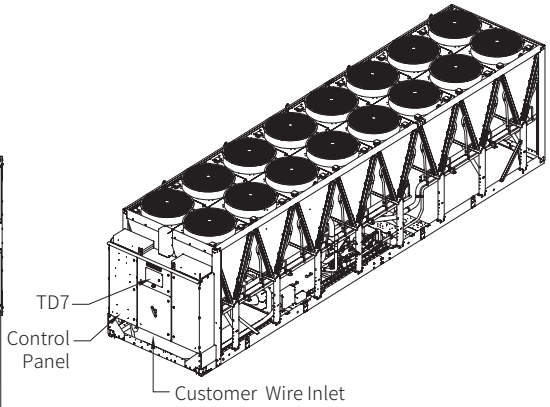
▲ Installation Point
● Lifting Point

Unit	Water Box	H1 (mm)	H2 (mm)	W1 (mm)	W2 (mm)	L1 (mm)	L2 (mm)	Water pipe
RTAG205XSE	150psi	408	423	1275.5	969.5	5295.4	5295.4	6″
	300psi	409.5	424.5	1275.5	969.5	5609.4	5459.4	6″

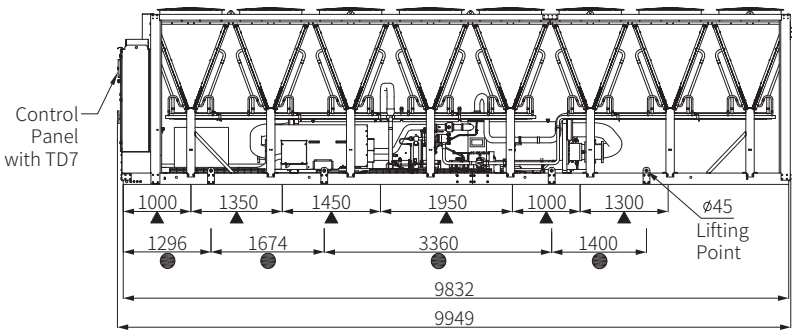
RTAG XSE 275



Top View(Coil Condenser Hidden)

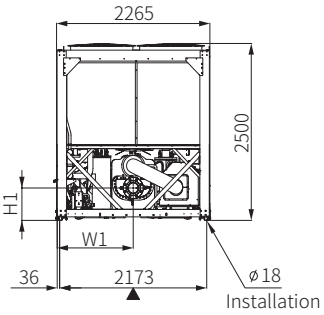


ISO View



Side View

Back View

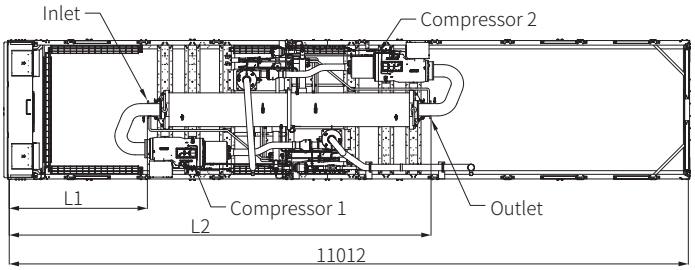


Back View

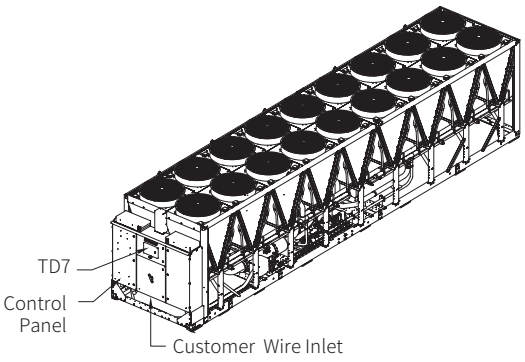
▲ Installation Point
● Lifting Point

Unit	Water Box	H1 (mm)	W1 (mm)	L1 (mm)	L2 (mm)	Water pipe
RTAG275XSE	150psi	457.5	1122.5	2239.2	6839.8	6″
	300psi	457.5	1122.5	1986.7	7092.3	6″

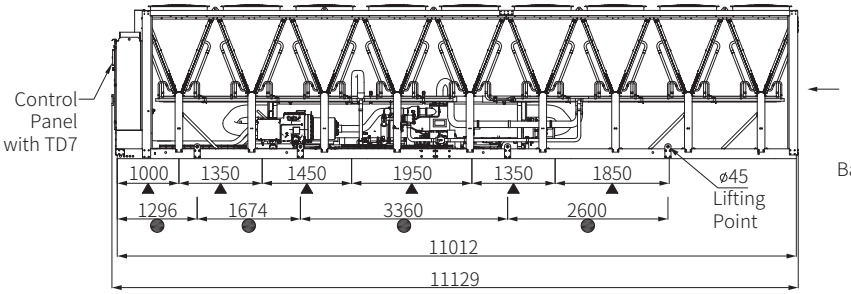
RTAG XSE 340



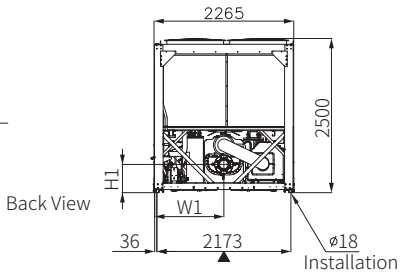
Top View(Coil Condenser Hidden)



ISO View



Side View



Back View

Back View

▲ Installation Point
● Lifting Point

Unit	Water Box	H1 (mm)	W1 (mm)	L1 (mm)	L2 (mm)	Water pipe
RTAG340XSE	150psi	457.5	1122.5	2239.2	6839.8	6″
	300psi	457.5	1122.5	1986.7	7092.3	6″

Mechanical Specifications

General

Chilled water production will be made by a factory assembled and tested, air-cooled liquid chiller. Chiller will have two refrigerant circuits with one compressors per circuit. Documentation including installation-operation maintenance manual, user guide, wiring diagram and submittal is placed in the control panel.

Compressors and Motors

GP4 Wi compressors are helical lobed, twin screw type, with 6 lobes on the male rotor and 7 lobes on the female rotor. In order to maximize part load efficiency, the compressor utilizes a two position valve, placing the compressor in either high or low volume ratio (i.e. Hi VI vs Lo VI). Valve position is controlled using oil and system pressures by selectively activating two solenoid control valves. The compressor is of cast iron, semi-hermetic construction, directly driven by a low voltage (480V max drive input), six-pole, three-phase, permanent magnet motor. The motor is designed exclusively for use with a variable speed drive. All suction gas passes through the motor air gap or around the outside of the stator motor for cooling.

Oil Management

The chiller is equipped with an oil management system without oil pump that ensures proper oil circulation throughout the unit. The key components of the system include an oil separator, oil filter, and thermosyphon oil return system. The oil filter is a four-micron Beta 100- element and is replaceable. An oil heater is installed to avoid startup with low oil temperature.

An optional oil cooler is installed when the unit is used for high condensing temperature.

Adaptive Frequency Drive (AFD) mounted

Compressors of RTAG XSE all are equipped with an adaptive frequency drive, factory mounted, tested and wired. Frequency converter will drive the chiller start and ramp up, and the partial load operation.

AFD enclosure is IP54 as standard, with integrated air cooling system, consisting of a fan below the VFD frame.

Evaporator

The evaporator is a tube-in-shell heat exchanger design with internally and externally finned copper tubes roller expanded into the tube sheet. If select the option of "ASME Pressure Vessel Code" , the evaporator is designed, tested and stamped in accordance with ASME for a refrigerant side working pressure of 200 psig. The evaporator is designed for a water side working pressure of 150 /300 psig. Water connections are flange. Each shell includes a vent, a drain and fittings for temperature control sensors and is insulated with 3/4 inch equal insulation (K=0.26). Evaporator heaters with thermostat are provided to help protect the evaporator from freezing at ambient temperatures down to -20°F (-29°C). Factory installed flow switch is installed on a pipe stub in the evaporator inlet.

Condenser and Fans

Air-cooled condenser coils have aluminum fins mechanically bonded to internally finned seamless copper tubing. The condenser coil has an integral subcooling circuit. Condensers are factory proof and leak tested at 435 psig.

Direct-drive vertical-discharge airfoil condenser fans are dynamically balanced.
Standard units will start and operate from -20°C to 46°C (-4°F to115°F) ambient.
Units are equipped with EC condenser fan motors.

Refrigerant Circuit

Each unit has two refrigerant circuits, with one rotary screw compressors per circuit.
Each refrigerant circuit includes liquid line shut off valve, removable core filter, charging port, high pressure and low pressure safety valves and electronic expansion valve.

Electrical Panel

Single point power connection with disconnect switch and fuses.
The disconnect switch is mechanically interlocked to disconnect line power from the starter before the starter doors are open.
All components and control cables are numbered in accordance with CEI 60750.
A factory-installed, factory-wired control power transformer provides all unit control power and Symbio800 module power. All the starter elements are enclosed in an IP54 panel, with hinged door.

Unit Controls (Tracer Symbio800)

The microprocessor-based control panel is factory installed and factory-tested. The control system is powered by a control power transformer. It loads and unloads the chiller through adjustment of the compressor speed through a Adaptive Frequency Drive.
Microprocessor-based chilled water reset based on return water is standard. The Symbio800 utilizing the "Adaptive Control™" microprocessor automatically takes action to prevent unit shutdown due to abnormal operating conditions associated with low evaporator refrigerant temperature, high condensing temperature, and motor current overload. If abnormal operating condition continues and protective limit is reached, the refrigerant circuit will be shut down. Controller includes machine protection shutdown requiring manual reset for:

- Low evaporator refrigerant temperature and pressure
- High condenser refrigerant pressure
- Low oil flow
- Critical sensor or detection circuit fault
- Motor current overload
- High compressor discharge temperature
- Communications lost between modules
- Electrical distribution faults: phase loss, phase imbalance, phase reversal
- External and local emergency stop
- Starter transition failure.

The panel includes machine protection shutdown with automatic reset when the condition is corrected for:

- Momentary power loss
- Over / under voltage
- Loss of evaporator water flow.

Over 100 diagnostic checks is made and are displayed when a fault is detected. The display indicates the fault, the type of reset required, the time and date the diagnostic occurred, the mode in which the machine was operating at the time of the diagnostic, and a help message. A diagnostic history displays the last 20 diagnostics with the time and date of their occurrence. Alarms and diagnostics are displayed in chronological order, with a color/symbol code: red octagon for immediate shutdown, yellow triangle for normal shutdown and blue circle for warning.

Human interface with Touchable Display Trane TD7

- Factory-mounted above the control panel door
- UV Resistant touchscreen
- -40°C to 70°C operating temperature
- IP56 rated
- CE certification
- Emissions: EN55011(Class B)
- Immunity: EN61000 (Industrial)
- 7" diagonal
- 800x480 pixels
- TFT LCD @ 600 nits brightness
- 16 bit color graphic display

Display features:

- Alarms
- Reports
- Chiller settings
- Display settings
- Graphing

Dry contacts

Symbio800 provides a flexible alarm or chiller status indication to a remote location through a hard wired interface to a dry contact closure. Four relays are available for this function.

Trane - by Trane Technologies (NYSE: TT), a global climate innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

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Supersedes