Air-Cooled Series R® Helical-rotary Chiller

Model RTAD 85-100-115-125
250 to 430 kW (50 Hz)

Built for the Industrial and Commercial Markets

RLC-PRC015-E4

Introduction

The new Trane Model RTAD Air Cooled Helical Rotary Screw Chiller: the search for Reliability, and Lower Sound Levels for today's environment.
The Model RTAD chiller utilizes the proven design of the Trane helical rotary screw compressor; which embraces all of the design features that have made the Trane helical rotary screw compressor liquid chillers such a success since 1987.

What's New
The RTAD offers the same high reliability coupled with a competitive physical footprint, and improved acoustical performance due to its advanced design, low speed/direct drive compressor and proven Series R performance.

The major differences between the Series R, Model RTAD and Model RTAB are:

- Lower sound levels.
- Designed specifically for operating with environment safe HFC-134a.
- A wider capacity range
- High Ambient units for operation up to 46°C with 915 rpm fans

The Series R Model RTAD helical rotary screw chiller is an industrial grade design built for the commercial market. It is ideal for schools, hospitals, retailers, and office buildings.

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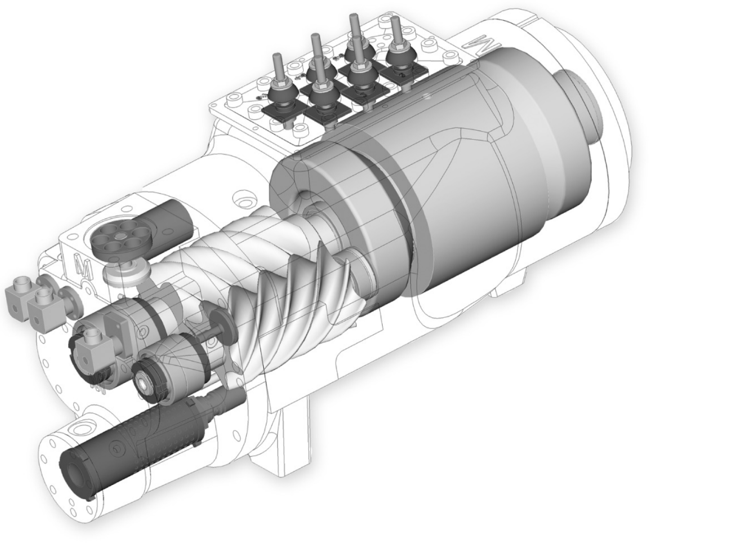
Features and Benefits

The Series R® Helical Rotary Screw Compressor

- Unequaled Reliability. The next generation Trane helical rotary screw compressor is designed, built and tested to the same demanding and rugged standards as the Trane scroll compressors, the centrifugal compressors, and the previous generation helical rotary screw compressors used in both air and water cooled chillers for more than 13 years.
- Years of research and testing. The Trane helical rotary screw compressor has amassed thousands of hours of testing, much of it at severe operating conditions beyond normal commercial air conditioning applications.
- Proven track record. The Trane Company is the world's largest manufacturer of large helical rotary compressors used for refrigeration. Over 90,000 compressors worldwide have proven that the Trane helical rotary screw compressor has a reliability rate of greater than 99.5 percent in the first year of operation - unequalled in the industry.
- Resistance to liquid slugging. The robust design of the Series R compressor can ingest amounts of liquid refrigerant that would severely damage reciprocating compressor valves, piston rods and cylinders.
- Fewer moving parts. The helical rotary screw compressor has only two rotating parts: the male rotor and the female rotor. Unlike reciprocating compressors, the Trane helical rotary screw compressor has no pistons, connecting rods, suction and discharge valves or mechanical oil pump. In fact, a typical reciprocating compressor has 15 times as many critical parts as the Series R compressor. Fewer moving parts lead to increased reliability and longer life.
- Direct-drive, low speed, semi-hermetic compressor for high efficiency and high reliability.
- Field serviceable compressor for easy maintenance.
- Suction gas-cooled motor. The motor operates at lower temperatures for longer motor life.
- Five minute start-to-start/two minute stop-to-start anti-recycle timer allows for closer water loop temperature control.

Figure 1 - Cutaway of a compressor



Improved Operating Capabilities

Larger Capacity Range
The Series R Model RTAD include seven sizes available in standard or high efficiency versions covering a total capacity range from 250 to 480kW where the previous largest RTAB 212 had a capacity of 360kW. The efficient RTAC air-cooled helical-rotary chillers are available for larger capacity up to 1500kW.

High Ambient Operation Capability
The High Ambient Series R Model RTAD have been designed for operation at 46°C at full load, some units can also operate at 49°C at full load using 915 rpm ZephyrWing fans. The former RTAB were using 1410 rpm fans were generating higher sound levels requiring on site additional and costly sound treatments, the RTAD will then be the ideal solution for applications having sound restrictions.

Improved Acoustical Performance
The sound levels of the Series R Model RTAB have been steadily improved since its introduction with the different options to reduce the sound level. With the advent of the Model RTAD, sound levels are reduced significantly with the new compressor specifically designed to minimize sound generation.

Superior Efficiency levels - the bar has been raised
The High Efficiency Trane Model RTAD has COP levels better than the previous RTAB and also better COP levels than conventional reciprocating chillers operating with blends of refrigerant.
The modern technology of the RTAD with the efficient direct-drive compressor, the electronic expansion valve and the UCM-CLD Microprocessor Adaptive Control® has permitted Trane to achieve these efficiency levels.

- Precise Rotor Tip Clearances. Higher energy efficiency in a helical rotary screw compressor is obtained by reducing the rotor tip clearances.

Features and Benefits

This next generation compressor is no exception. With today's advanced manufacturing technology, clearances can be controlled to even tighter tolerances. This reduces the leakage between high and low pressure cavities during compression, allowing for more efficient compressor operation.

- Capacity Control and Load Matching. The combination patented unloading system on Trane helical rotary screw compressor utilizes the variable unloading valve 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 of setpoint. Reciprocating and screw 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. Much of this excess capacity is lost because overcooling goes toward building latent heat removal, causing the building to be dried beyond normal comfort requirements. When the load becomes very low, the compressor also uses a step unloader valve which is a single unloading step to achieve the minimum unloading point of the compressor. The result of this design is optimized part-load performance far superior to single reciprocating compressors and step-only screw compressors.

Simple Installation

- Factory Testing Means Trouble-Free Start-Up. All air-cooled Series R 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 leaving liquid temperature set point. The end 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/Options Speed Installation. All Series R chiller options, including main power supply disconnect, low ambient control, ambient temperature sensor, low ambient lockout, communication interface and ice making controls are factory installed and tested.

Superior Control with the UCM-CLD Adaptive Control™ Microprocessor Module

System Options - Ice Storage

Trane air-cooled chillers are well suited for ice production. The unique ability to operate at decreased ambient temperature while producing ice lends to roughly the same work seen by the compressor. An air-cooled machine typically switches to ice production at night. Two things happen under this assumption. First, the leaving brine temperature from the evaporator is lowered to around -5.5 to -5°C. Second, the ambient temperature has typically dropped about 8.3 to 11°C from the peak daytime ambient. This effectively places a lift on the compressors that is similar to daytime running conditions. The chiller can operate in lower ambient at night and successfully produce ice to supplement the next day's cooling demands.

The Model RTAD produces ice by supplying ice storage tanks with a constant supply of glycol solution. Air-cooled chillers selected for these lower leaving fluid temperatures are also selected for efficient production of chilled fluid at nominal comfort cooling conditions. The ability of Trane chillers to serve "double duty" in ice production and comfort cooling greatly reduces the capital cost of ice storage systems.

When cooling is required, ice chilled glycol is pumped from the ice storage tanks directly to the cooling coils. No expensive heat exchanger is required. The glycol loop is a sealed system, eliminating expensive annual chemical treatment costs. The air-cooled chiller is also available for comfort cooling duty at nominal cooling conditions and efficiencies. The modular concept of glycol ice storage systems and the proven simplicity of Trane Tracer™ controls allow the successful blend of reliability and energy saving performance in any ice storage application.

The ice storage system is operated in six different modes: each optimized for the utility cost of the hour.

1. Provide comfort cooling with chiller
2. Provide comfort cooling with ice
3. Provide comfort cooling with ice and chiller
4. Freeze ice storage
5. Freeze ice storage when comfort cooling is required
6. Off

Tracer optimization software controls operation of the required equipment and accessories to easily transition from one mode of operation to another. For example:

Even with ice storage systems there are numerous hours when ice is neither produced nor consumed, but saved. In this mode the chiller is the sole source of cooling. For example, to cool the building after all ice is produced but before high electrical demand charges take effect, Tracer sets the air-cooled chiller leaving fluid set point to its most efficient setting and starts the chiller, chiller pump, and load pump.

When electrical demand is high, the ice pump is started and the chiller is either demand limited or shut down completely. Tracer controls have the intelligence to optimally balance the contribution of ice and chiller in meeting the cooling load.

The capacity of the chiller plant is extended by operating the chiller and ice in tandem. Tracer rations the ice, augmenting chiller capacity while reducing cooling costs. When ice is produced, Tracer will lower the air-cooled chiller leaving fluid set point and start the chiller, ice and chiller pumps, and other accessories. Any incidental loads that persists while producing ice can be addressed by starting the load pump and drawing spent cooling fluid from the ice storage tanks.

For specific information on ice storage applications, contact your local Trane sales office.

Features and Benefits

Options

High Efficiency/Performance Option
This option provides oversized heat exchangers with two purposes. One, it allows the unit to be more energy efficient. Two, the unit will have enhanced operation in high ambient conditions.

Low Temperature Brine
The hardware and software on the unit are factory set to handle low temperature brine applications, typically below 5°C.

Ice Making
The unit controls are factory set to handle ice making for thermal storage applications.

Communication interface module
Provides the following possibilities:

1. Tracer/Summit Communication Interface Permits bi-directional communication to the Trane Integrated Comfort system.
2. Chilled Water Temperature Reset This option provides the control logic and field installed sensors to reset leaving chilled water temperature. The setpoint can be reset based off of either ambient temperature or return evaporator water temperature.
3. External Chilled Water Setpoint Allows the external setting independent of the front panel set point by mean of a 2-10VDC input or a 4-20mA input.
4. External Current Limit Setpoint Allows the external setting independent of the front panel set point by mean of a 2-10VDC input or a 4-20mA input.

Coil Protection
Rectangle punching type panels that protect the condenser coils on the two-third upper part only. The compressors and the evaporator are accessible.

Service Valves
Provides a service valve on the discharge line of each circuit to facilitate compressor servicing.

High Ambient Option
The high ambient option consists of special control logic to permit high ambient (46 °C) operation.

Low Ambient Option
The low ambient option consists of special control logic and fans to permit low ambient (down to -18 °C) operation.

Power Disconnect Switch
A disconnect switch plus compressor protection fuses with a through-the-door handle is provided to disconnect main power.

Night Noise Set Back
At night, on a contact closure all the fans run at low speed bringing the overall sound level further down. Not available on high ambient units.

Neoprene Isolators
Isolators provide isolation between chiller and structure to help eliminate vibration transmission. Neoprene isolators are more effective and recommended over spring isolators.

Low Noise Version
The unit is equipped with low speed fans and compressors sound attenuating enclosure. All the sound emissive parts like refrigerant lines and panels subject to vibration are acoustically treated with sound absorbent material.

Ground Fault Detection
Sensing ground current for an improved chiller protection.

Pressure Gauges
A set of two pressure gauges per refrigerant circuit, one for low pressure and one for high pressure.

Counter Flanges
One set of mating flanges on which the customer will weld the pipe-work. (supplied with bolts and gaskets)

Flow Switch
For field installation on the chilled water outlet connection.

Under/Over-voltage protection
Controls the variation of the power supply voltage. If the value exceeds the minimum or maximum voltage, the unit is shut down.

IP20 protection
Provides a protection against direct contacts inside the control panel. The current -carrying parts are shrouded in order to prevent accidental contact.

Application Considerations

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

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 over-sized chiller. In addition, an oversized unit is usually more expensive to purchase, install, and operate. If over-sizing 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 air-cooled Series R chillers. Use of either will lead to a shortened life to an indeterminable degree. The Trane Company 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.

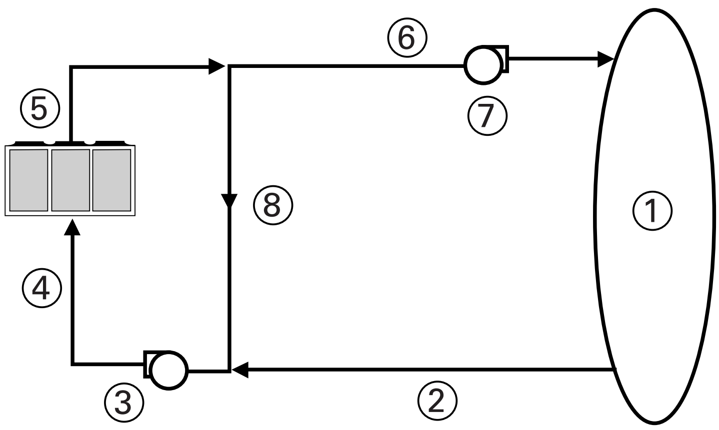
Effect Of Altitude on Capacity
Air-cooled Series R chiller capacities given in the performance data tables are for use at sea level. At elevations substantially above sea level, the decreased air density will reduce condenser capacity and, therefore, unit capacity and efficiency. The adjustment factors can be applied directly to the catalog performance data to determine the unit's adjusted performance.

Ambient Limitations
Trane air-cooled Series R chillers are designed for year-round operation over a range of ambient temperatures. The air-cooled Model RTAD chiller will operate in ambient temperatures of 7 to 40 °C. Selecting the high ambient option will allow the chiller to operate in ambient temperatures above 40 °C and selecting the low ambient option will increase the operational capability of the water chiller to ambient temperatures as low as -18 °C. For operation outside of these ranges, contact the local Trane sales office.

Water Flow Limits
The minimum water flow rates are given in 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 in the general data section. Flow rates exceeding those listed may result in excessive tube erosion. The evaporator can withstand up to 50 percent water flow reduction as long as this flow is equal or above the minimum flow rate requirement. The microprocessor and capacity control algorithms are designed to take a minimum of 10% change in water flow rate per minute.

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 RTAD evaporator. A simple piping change can alleviate this problem. For example: A plastic injection molding process requires 5.1 l/s of 10°C water and returns that water at 15.6°C. The selected chiller can operate at these temperatures, but has a minimum flow rate of 7.6 l/s. The following system can satisfy the process.

Figure 2 - Evaporator flow rate out of range

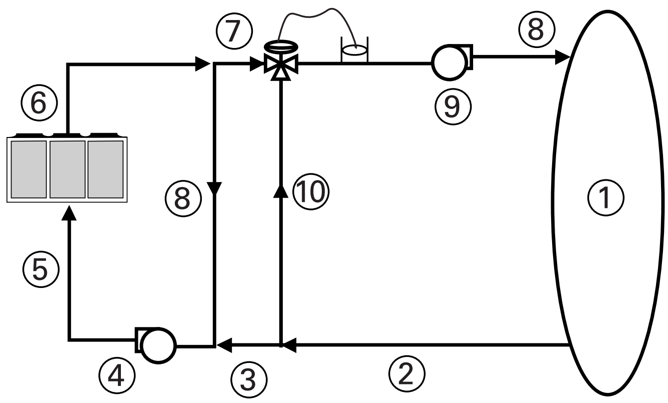


1. Load
2. 15.6°C - 5 L/s
3. Chilled water pump - 7.5 L/s
4. 13.7°C - 7.6 L/s
5. 10°C - 7.6 L/s
6. 10°C - 5 L/s
7. Chilled water pump - 5 L/s
8. 10°C - 2.5 L/s

Application Considerations

Leaving Water Temperature Range. Trane air-cooled Series R chillers have three distinct leaving water categories: standard, low temperature, and ice making. The standard leaving solution temperature range is 4.4 to 15.6 °C. Low temperature machines produce leaving liquid temperatures less than 4.4 °C. Since liquid supply temperature setpoints less than 4 .4 °C result in suction temperatures at or below the freezing point of water, a glycol solution is required for all low temperature machines. Ice making machines have a leaving liquid temperature range of -6.7 to 15.6 °C. Ice making controls include dual set point controls and safeties for ice making and standard cooling capabilities. Consult your local Trane sales engineer for applications or selections involving low temperature or ice making machines. The maximum water temperature that can be circulated through an evaporator when the unit is not operating is 42 °C .

Figure 3 - If temperatures are out of range for equipment



1. Load
2. 35°C - 7.6 L/s
3. 35°C - 2.2 L/s
4. Chilled water pump
5. 21°C - 7.6 L/s
6. 15.6°C - 7.6 L/s
7. 15.6°C - 2.2 L/s
8. 15°C - 5.4 L/s
9. Chilled water pump
10. 35°C - 5.4 L/s

Leaving Water Temperature out of Range
Similar to the flow rates above, many process cooling jobs require temperature ranges that cannot be met with the minimum and maximum published values for the Model RTAD evaporator. A simple piping change can alleviate this problem. For example: A laboratory load requires 7.6 l/s of water entering the process at 29.4°C and returning at 35°C. The accuracy required is better than cooling tower can give. The selected chiller has adequate capacity, but a maximum leaving chilled water temperature of 15°C.

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 simply be more water bypassing and mixing with warm water.

Supply Water Temperature Drop
The performance data for the Trane air-cooled Series R chiller is based on a chilled water temperature drop of 6°C. Chilled water temperature drops from 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 are beyond the optimum range for control and may adversely affect the microcomputer's ability to maintain an acceptable supply water temperature range. Furthermore, temperature drops of less than 3.3 °C may result in inadequate refrigerant superheat. Sufficient superheat is always a primary concern in any direct expansion refrigerant system and is especially important in a package chiller where the evaporator is closely coupled to the compressor. When temperature drops are less than 3.3 °C, an evaporator runaround loop may be required.

Ice Storage Provides Reduced Electrical Demand
An ice storage system uses a standard chiller to make ice at night when utilities charge less for electricity. The ice supplements or even replaces mechanical cooling during the day when utility rates are at their highest. This reduced need for cooling results in big utility cost savings.
Another advantage of ice storage is standby cooling capacity. If the chiller is unable to operate, one or two days of ice may still be available to provide cooling. In that time the chiller can be repaired before building occupants feel any loss of comfort.
The Trane Model RTAD chiller is uniquely suited to low temperature applications like ice storage because of the ambient relief experienced at night. This allows the Model RTAD chiller to produce ice efficiently, with less stress on the machine.
Simple and smart control strategies are another advantage the Model RTAD chiller offers for ice storage applications. Trane Tracer® building management systems can actually anticipate how much ice needs to be made at night and operate the system accordingly. The controls are

integrated right into the chiller. Two wires and preprogrammed software dramatically reduce field installation cost and complex programming.

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 from the building return water. Typically, a two-minute water loop is sufficient to prevent a short water loop. Therefore, as a guideline, ensure the volume of water in the evaporator loop equals or exceeds two times the evaporator flow rate. For a rapidly changing load profile, the amount of volume should be increased. To prevent the effect of a short water loop, the following items 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.

Applications Types
- Comfort cooling.
- Industrial process cooling.
- Ice/thermal storage.
- Low temperature process cooling.

Selection Procedure

The chiller capacity tables cover the most frequently encountered leaving liquid temperatures. The tables reflect a 6°C temperature drop through the evaporator. For other temperature drops, apply the appropriate Performance Data Adjustment Factors. For chilled brine selections, refer to Figures F-2 and 3 for Ethylene and Propylene Glycol Adjustment Factors.

Selection Procedure SI units
The chiller capacity tables P1 through P16, cover the most frequently encountered leaving water temperatures. The tables reflect a 6°C temperature drop through the evaporator
To select a Trane air-cooled RTAD chiller, the following information is required:

1. Design load in kW of refrigeration
2. Design chilled water temperature drop
3. Design leaving chilled water temperature
4. Design ambient temperature

Evaporator flow rates can be determined by using the following formula:

l/s = kW (Capacity) x 0.239 / Temperature Drop (Degrees C)

To determine the evaporator pressure drop we use the flow rate (l/s) and the evaporator water pressure drop Figure F1
For selection of chilled brine units or applications where the altitude is significantly greater than sea level or the temperature drop is different than 6°C, the performance adjustment factors from Table P22 should be applied at this point.
For example:
Corrected Capacity = Capacity (unadjusted) x Glycol Capacity Adjustment Factor
Corrected Flow Rate = Flow Rate (unadjusted) x Glycol Flow Rate Adjustment Factor

5. The final unit selection is:

- QTY (1) RTAD 115 (Table P-3)
- Cooling Capacity = 386.2 kW
- Entering/Leaving Chilled Water Temperatures = 12/7°C
- Ambient 35°C
- Chilled Water Flow Rate = 18.46 l/s
- Evaporator Water Pressure Drop = 70 kPa
- Compressor Power Input = 139.8 kW
- Unit COP = 2.57 kW/kW

Contact the local Trane sales engineer for a proper selection at the given operating conditions.

Selection Procedure English units
1 ton = 3.5168 kW
Evaporator flow rate in GPM = 24 x tons / delta T (F)
Delta T (F) = delta T (°C) x 1.8
1 GPM = 0.06309 l/s
1 ft WG = 3 kPa
EER = COP / 0.293

General Data

SI Units

Table G-1 - General Data RTAD Standard

Size		**85**	**100**	**115**	**125**
Compressor Quantity		2	2	2	2
Nominal Size (1)	(Tons)	40/40	50/50	60/60	70/70
Evaporator					
Evaporator Model		EG 120	EG 140	EG 170	EG 200
Water Storage	(l)	106	270	222	204
Minimum Flow	(l/s)	5.7	6.9	8.2	9.5
Maximum Flow	(l/s)	17.3	20.8	24.6	28.4
Condenser					
Qty of Coils		2	2	2	2
Coil Length	(mm)	2743	3658	3658	3658
Coil Height	(mm)	1575	1575	1575	1575
Fin series	(Fins/ft)	192	192	192	192
Number of Rows		3/3	2/2	3/3	3/3
Condenser Fans					
Quantity (1)		6	6	6	6
Diameter	(mm)	762	762	762	762
Total Air Flow	(m^3/s)	23.43	28.59	27.04	27.07
Nominal RPM		915	915	915	915
Tip Speed	(m/s)	36.48	36.48	34.48	34.48
Motor kW	(kW)	1.9	1.9	1.9	1.9
Min Starting/Oper Ambient (2)					
Standard Unit	(°C)	7	7	7	7
Low Ambient Unit	(°C)	-18	-18	-18	-18
General Unit					
Refrigerant		HFC 134a	HFC 134a	HFC 134a	HFC 134a
No. Of independent Refrigerant Circuits		2	2	2	2
% Min. Load (3)		17	17	17	17
Refrigerant Charge (1)	(kg)	51	50	69	71
Oil Charge (1)	(l)	10	12	16	18
Operating Weight	(kg)	2660	3100	3560	3570
Shipping Weight	(kg)	2550	2835	3335	3570

Table G-2 - General Data RTAD High Efficiency

Size		**85**	**100**	**115**	**125**
Compressor Quantity		2	2	2	2
Nominal Size (1)	(Tons)	40/40	50/50	60/60	70/70
Evaporator					
Evaporator Model		EG 140	EG 170	EG 200	EG 200
Water Storage	(l)	270	222	204	204
Minimum Flow	(l/s)	5.7	6.9	8.2	9.5
Maximum Flow	(l/s)	17.3	20.8	24.6	28.4
Condenser					
Qty of Coils		2	2	2	2
Coil Length	(mm)	3658	3658	4572	4572
Coil Height	(mm)	1575	1575	1575	1575
Fin series	(Fins/ft)	192	192	192	192
Number of Rows		3/3	3/3	3/3	3/3
Condenser Fans					
Quantity (1)		6	8	8	10
Diameter	(mm)	762	762	762	762
Total Air Flow	(m^3/s)	27.0	31.2	35.0	39.1
Nominal RPM		915	915	915	915
Tip Speed	(m/s)	36.48	36.48	36.48	36.48
Motor kW	(kW)	1.9	1.9	1.9	1.9
Min Starting/Oper Ambient (2)					
Standard Unit	(°C)	7	7	7	7
Low Ambient Unit	(°C)	-18	-18	-18	-18
General Unit					
Refrigerant		HFC 134a	HFC 134a	HFC 134a	HFC 134a
No. Of independent Refrigerant Circuits		2	2	2	2
% Min. Load (3)		17	17	17	17
Refrigerant Charge (1)	(kg)	50	69	87	87
Oil Charge (1)	(l)	10	12	18	18
Operating Weight	(kg)	3240	3370	3905	4000
Shipping Weight	(kg)	2975	3145	3700	3800

General Data

Table G-3 - General Data RTAD High Efficiency Low Noise

Size		**85**	**100**	**115**	**125**
Compressor Quantity		2	2	2	2
Nominal Size (1)	(Tons)	40/40	50/50	60/60	70/70
Evaporator					
Evaporator Model		EG 140	EG 170	EG 200	EG 200
Water Storage	(l)	270	222	204	204
Minimum Flow	(l/s)	5.7	6.9	8.2	9.5
Maximum Flow	(l/s)	17.3	20.8	24.6	28.4
Condenser					
Qty of Coils		2	2	2	2
Coil Length	(mm)	3658	3658	4572	4572
Coil Height	(mm)	1575	1575	1575	1575
Fin series	(Fins/ft)	192	192	192	192
Number of Rows		3/3	3/3	3/3	3/3
Condenser Fans					
Quantity (1)		6	8	8	10
Diameter	(mm)	762	762	762	762
Total Air Flow	(m^3/s)	19.25	22.23	24.99	27.83
Nominal RPM		690	690	690	690
Tip Speed	(m/s)	27.5	27.5	27.5	27.5
Motor kW	(kW)	0.85	0.85	0.85	0.85
Min Starting/Oper Ambient (2)					
Standard Unit	(°C)	7	7	7	7
Low Ambient Unit	(°C)	-18	-18	-18	-18
General Unit					
Refrigerant		HFC 134a	HFC 134a	HFC 134a	HFC 134a
No. Of independent Refrigerant Circuits		2	2	2	2
% Min. Load (3)		17	17	17	17
Refrigerant Charge (1)	(kg)	50	69	87	87
Oil Charge (1)	(l)	10	12	18	18
Operating Weight	(kg)	3340	3470	4005	4100
Shipping Weight	(kg)	3075	3245	3800	3900

Notes:
(1) Data containing information for the two circuits.
(2) Minimum start-up/operation ambient based on a 2.22 m/s wind across the condenser.
(3) Percent minimum load is for total machine at 10°C ambient and 7°C leaving chilled water temp. Not each individual circuit.

General Data

General Data English Units

Table G-4- General Data RTAD Standard

Size		85	100	115	125
Compressor Quantity		2	2	2	2
Nominal Size (1)	(Tons)	40/40	50/50	60/60	70/70
Evaporator					
Evp. Model		EG 120	EG 140	EG 170	EG 200
Water Storage	(Gallons)	28	71.3	58.6	53.9
Min. Flow	(GPM)	90	110	130	150
Max. Flow	(GPM)	275	330	390	450
Condenser					
Qty of Coils		2	2	2	2
Coil Length	(Ft)	9	12	12	12
Coil Height	(Ft)	5.167	5.167	5.167	5.167
Fin series	(Fins/ft)	192	192	192	192
Number of Rows		3/3	2/2	3/3	3/3
Condenser Fans					
Quantity (1)		6	6	6	6
Diameter	(Inch)	30	30	30	30
Total Air Flow	(CFM)	49652	60576	57304	57360
Nominal RPM		915	915	915	915
Tip Speed	(Ft/s)	120	120	120	120
Motor kW	(kW)	1.9	1.9	1.9	1.9
Min Starting/Oper Ambient (2)					
Std Unit	(°F)	45	45	45	45
Low Ambient Unit	(°F)	0	0	0	0
General Unit					
Refrigerant		HFC 134a	HFC 134a	HFC 134a	HFC 134a
No. Of independent Refrigerant Circuits		2	2	2	2
% Min. Load (3)		17	17	17	17
Refrigerant Charge (1)	(lbs)	112.3	110.1	152.0	156.4
Oil Charge (1)	(Gallons)	2.64	3.17	4.23	4.76
Operating Weight	(lbs)	5859	6828	7841	7863
Shipping Weight	(lbs)	5617	6244	7346	7863

Table G-5 - General Data RTAD High Efficiency

Size		85	100	115	125
Compressor Quantity		2	2	2	2
Nominal Size (1)	(Tons)	40/40	50/50	60/60	70/70
Evaporator					
Evp. Model		EG 140	EG 170	EG 200	EG 200
Water Storage	(Gallons)	71.3	58.6	53.9	53.9
Min. Flow	(GPM)	90	110	130	150
Max. Flow	(GPM)	275	330	390	450
Condenser					
Qty of Coils		2	2	2	2
Coil Length	(Ft)	12	12	15	15
Coil Height	(Ft)	5.167	5.167	5.167	5.167
Fin series	(Fins/ft)	192	192	192	192
Number of Rows		3/3	3/3	3/3	3/3
Condenser Fans					
Quantity (1)		6	8	8	10
Diameter	(Inch)	30	30	30	30
Total Air Flow	(CFM)	57228	66175	74244	82776
Nominal RPM		915	915	915	915
Tip Speed	(Ft/s)	120	120	120	120
Motor kW	(kW)	1.9	1.9	1.9	1.9
Min Starting/Oper Ambient (2)					
Std Unit	(°F)	45	45	45	45
Low Ambient Unit	(°F)	0	0	0	0
General Unit					
Refrigerant		HFC 134a	HFC 134a	HFC 134a	HFC 134a
No. Of independent Refrigerant Circuits		2	2	2	2
% Min. Load (3)		17	17	17	17
Refrigerant Charge (1)	(lbs)	110.1	152.0	191.6	191.6
Oil Charge (1)	(Gallons)	2.6	3.2	4.8	4.8
Operating Weight	(lbs)	7137	7423	8601	8811
Shipping Weight	(lbs)	6553	6927	8150	8370

General Data

Table G-6 - General Data RTAD High Efficiency Low Noise

Size		**85**	**100**	**115**	**125**
Compressor Quantity		2	2	2	2
Nominal Size (1)	(Tons)	40/40	50/50	60/60	70/70
Evaporator					
Evp. Model		EG 140	EG 170	EG 200	EG 200
Water Storage	(Gallons)	71.3	58.6	53.9	53.9
Min. Flow	(GPM)	90	110	130	150
Max. Flow	(GPM)	275	330	390	450
Condenser					
Qty of Coils		2	2	2	2
Coil Length	(Ft)	12	12	15	15
Coil Height	(Ft)	5.167	5.167	5.167	5.167
Fin series	(Fins/ft)	192	192	192	192
Number of Rows		3/3	3/3	3/3	3/3
Condenser Fans Quantity (1)		6	8	8	10
Diameter	(Inch)	30	30	30	30
Total Air Flow	(CFM)	40789	47109	52950	58969
Nominal RPM		690	690	690	690
Tip Speed	(Ft/s)	90	90	90	90
Motor kW	(kW)	0.85	0.85	0.85	0.85
Min Starting/Oper Ambient (2)					
Std Unit	(°F)	45	45	45	45
Low Ambient Unit	(°F)	0	0	0	0
General Unit					
Refrigerant		HFC 134a	HFC 134a	HFC 134a	HFC 134a
No. Of independent Refrigerant Circuits		2	2	2	2
% Min. Load (3)		17	17	17	17
Refrigerant Charge (1)	(lbs)	110.1	152.0	191.6	191.6
Oil Charge (1)	(Gallons)	2.6	3.2	4.8	4.8
Operating Weight	(lbs)	7357	7643	8822	9031
Shipping Weight	(lbs)	6773	7148	8370	8590

Notes:
1. Data containing information for the two circuits.
2. Minimum start-up/operation ambient based on a 5mph wind across the condenser.
3. Percent minimum load is for total machine at 50 °F ambient and 44 °F leaving chilled water temp. Not each individual circuit.

Performance Data

SI Units

Table P1 - RTAD 85 Standard

	Entering Condenser Air Temperature (°C)														
LWT	25			30			35			40			46		
°C	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	287.1	74.8	3.35	270.5	80.8	2.95	253.3	87.6	2.58	235.4	95.2	2.23	213.8	105.9	1.84
7	306.1	77.6	3.46	288.5	83.8	3.05	270.3	90.7	2.67	251.5	98.4	2.31	220.8	104.7	1.92
9	325.6	80.6	3.56	307.1	86.9	3.15	287.8	93.9	2.76	268.0	101.7	2.39	225.2	101.6	2.01
11	345.7	83.8	3.65	326.2	90.1	3.24	305.9	97.2	2.84	285.0	105.1	2.47	228.9	97.8	2.12
13	366.4	87.1	3.74	345.7	93.5	3.32	324.4	100.7	2.92	302.6	108.6	2.54	231.3	94.9	2.20

Table P2 - RTAD 100 Standard

	Entering Condenser Air Temperature (°C)														
LWT	25			30			35			40			46		
°C	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	345.5	92.6	3.35	325.2	98.9	2.97	304.2	106.2	2.61	282.7	114.3	2.27	242.5	118.1	1.89
7	367.9	96.4	3.44	346.4	102.8	3.06	324.3	110.1	2.69	301.6	118.4	2.35	246.2	114.3	1.98
9	391.0	100.3	3.53	368.3	106.8	3.14	345.0	114.3	2.77	321.1	122.6	2.42	249.1	109.7	19.74
11	414.8	104.4	3.61	390.9	111.1	3.22	366.3	118.6	2.84	341.2	127.1	2.49	254.0	107.1	2.18
13	439.2	108.7	3.69	414.0	115.5	3.29	388.2	123.1	2.91	349.7	126.3	2.57	256.8	103.4	2.26

Table P3 - RTAD 115 Standard

	Entering Condenser Air Temperature (°C)														
LWT	25			30			35			40			46		
°C	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	412.1	114.7	3.29	387.9	124.3	2.88	362.9	135.0	2.50	337.1	146.9	2.15	269.1	143.0	1.76
7	438.5	119.2	3.38	412.7	128.9	2.96	386.2	139.8	2.57	358.9	151.9	2.22	272.1	139.4	1.82
9	465.4	123.9	3.46	438.2	133.8	3.04	410.1	144.8	2.64	381.2	157.2	2.28	276.1	135.9	1.89
11	492.9	128.7	3.54	464.1	138.8	3.11	434.4	150.1	2.71	404.0	162.6	2.34	279.4	131.9	1.97
13	520.9	133.8	3.61	490.4	144.1	3.18	459.2	155.6	2.77	401.6	155.1	2.43	283.9	128.4	2.05

Table P4 - RTAD 125 Standard

	Entering Condenser Air Temperature (°C)														
LWT	25			30			35			40			46		
°C	C. C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	473.8	145.7	3.03	445.1	158.0	2.64	415.5	171.6	2.29	374.3	182.6	1.94	259.4	150.7	1.62
7	502.4	151.7	3.10	472.1	164.2	2.71	440.9	177.9	2.34	380.0	176.9	2.03	263.6	147.5	1.68
9	531.7	157.8	3.16	499.5	170.6	2.76	466.7	184.6	2.40	384.3	170.1	2.14	267.0	143.8	1.74
11	561.5	164.3	3.22	527.6	177.2	2.81	493.0	191.4	2.45	390.5	165.1	2.24	270.9	140.0	1.80
13	591.8	171.0	3.26	556.1	184.1	2.86	519.6	198.5	2.49	396.6	160.5	2.32	275.0	136.1	1.88

Notes :

1. Ratins based on sea level altitude and evaporatot fouling factor of 0.0176 m^2 K/kW
2. Consult Trane representative for performance at temperatures outside of the ranges shown
3. P.I. kW = compressor power input only.
4. COP = Coefficient of Performance (kW/kW). Power input include compressors, condenser fans and control power.
5. Ratings are based on an evaporator temperature drop of 6°C.
6. Interpolation betweeen points is permissible. Extrapolation is not permitted.
7. Above 40°C ambient, the units will have the High-Ambient option
8. Shaded area reflects Adaptive Control™ Microprocessor control algorithms.

Performance Data

SI Units

Table P5 - RTAD 85 High Efficiency

	Entering Condenser Air Temperature (°C)																	
LWT	25			30			35			40			46			52		
°C	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	310.0	72.2	3.74	292.3	77.6	3.31	273.8	83.8	2.90	254.7	90.8	2.52	231.1	100.3	2.09	206.8	110.9	1.71
7	330.9	75.0	3.86	312.2	80.5	3.43	292.6	86.8	3.01	272.4	93.8	2.62	247.4	103.4	2.18	220.7	113.4	1.79
9	352.5	77.9	3.98	332.7	83.5	3.54	312.0	89.8	3.11	290.7	96.9	2.71	264.4	106.6	2.27	224.2	109.5	1.88
11	374.8	81.0	4.09	353.7	86.6	3.64	332.0	93.0	3.21	309.6	100.2	2.80	281.9	109.9	2.35	228.1	105.6	1.97
13	397.7	84.2	4.19	375.4	89.9	3.74	352.5	96.3	3.31	329.0	103.5	2.89	300.0	113.3	2.43	232.0	102.3	2.07

Table P6 - RTAD 100 High Efficiency

	Entering Condenser Air Temperature (°C)																	
LWT	25			30			35			40			46			52		
°C	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	365.5	84.7	3.69	344.8	91.1	3.28	323.4	98.4	2.88	301.2	106.6	2.50	273.9	117.6	2.09	243.0	128.1	1.72
7	390.1	87.8	3.82	368.2	94.3	3.40	345.5	101.7	2.99	322.2	110.0	2.60	293.4	121.2	2.18	247.6	124.3	1.80
9	415.4	91.1	3.94	392.2	97.6	3.51	368.4	105.1	3.10	343.9	113.5	2.70	313.6	124.9	2.27	251.3	119.9	1.89
11	441.5	94.5	4.06	417.1	101.1	3.62	392.0	108.7	3.20	366.2	117.2	2.80	334.4	128.7	2.35	256.0	115.8	1.98
13	468.3	98.0	4.17	442.6	104.7	3.73	416.2	112.4	3.30	389.2	121.0	2.89	355.8	132.7	2.44	259.3	112.3	2.06

Table P7 - RTAD 115 High Efficiency

	Entering Condenser Air Temperature (°C)																	
LWT	25			30			35			40			46			52		
°C	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	432.6	109.2	3.51	408.8	118.0	3.10	384.3	127.9	2.72	358.9	139.0	2.35	327.6	154.0	1.96	252.8	148.3	1.57
7	462.5	113.3	3.63	437.2	122.2	3.22	411.2	132.2	2.82	384.3	143.5	2.45	351.1	158.7	2.04	255.7	144.6	1.62
9	493.4	117.5	3.75	466.6	126.5	3.33	439.0	136.8	2.92	410.5	148.2	2.54	375.3	163.6	2.12	260.1	141.2	1.69
11	525.3	121.9	3.87	496.9	131.1	3.43	467.6	141.5	3.02	437.5	153.1	2.63	398.6	167.7	2.20	264.3	137.6	1.75
13	558.1	126.6	3.97	528.1	135.9	3.53	497.1	146.4	3.11	465.3	158.2	2.71	415.3	168.0	2.29	268.6	134.0	1.83

Table P8 - RTAD 125 High Efficiency

	Entering Condenser Air Temperature (°C)																	
LWT	25			30			35			40			46			52		
°C	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	506.6	133.2	3.36	478.9	144.1	2.97	450.4	156.3	2.60	420.9	169.8	2.25	384.8	187.8	1.88	269.6	164.0	1.49
7	540.6	138.2	3.47	511.4	149.2	3.07	481.2	161.6	2.69	450.1	175.3	2.34	411.9	193.5	1.96	274.5	159.9	1.56
9	575.9	143.4	3.58	545.0	154.6	3.17	513.1	167.1	2.79	480.4	181.0	2.43	437.7	198.1	2.04	279.1	156.5	1.61
11	612.4	148.8	3.68	579.7	160.2	3.27	546.1	172.9	2.88	511.6	186.8	2.51	444.5	191.8	2.13	282.4	152.6	1.67
13	650.0	154.5	3.78	615.4	166.0	3.36	580.0	178.8	2.96	543.6	192.9	2.59	448.6	186.2	2.21	285.8	148.3	1.73

Notes :
1. Ratings based on sea level altitude and evaporator fouling factor of 0.0176 m^2 K/kW
2. Consult Trane representative for performance at temperatures outside of the ranges shown
3. P.I. kW = compressor power input only.
4. COP = Coefficient of Performance (kW/kW). Power input include compressors, condenser fans and control power.
5. Ratings are based on an evaporator temperature drop of 6°C.
6. Interpolation betweeen points is permissible. Extrapolation is not permitted.
7. Above 40°C ambient, the units will have the High-Ambient option
8. Shaded area reflects Adaptive Control™ Microprocessor control algorithms.

Performance Data

SI Units

Table P9 - RTAD 85 High Efficiency Low Noise

	Entering Condenser Air Temperature (°C)														
LWT	25			30			35			40			46		
°C	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	299.7	77.5	3.61	281.3	83.6	3.16	262.3	90.4	2.74	242.8	98.1	2.35	218.9	108.2	1.93
7	318.7	80.7	3.70	299.3	86.9	3.24	279.2	93.9	2.81	258.6	101.6	2.42	233.4	111.9	1.99
9	338.2	84.1	3.78	317.7	90.4	3.32	296.5	97.4	2.89	274.8	105.2	2.49	244.9	113.4	2.07
11	358.1	87.6	3.85	336.5	94.0	3.39	314.2	101.1	2.95	291.4	109.0	2.55	250.7	110.7	2.16
13	378.4	91.3	3.91	355.6	97.7	3.45	332.2	105.0	3.01	308.3	113.0	2.61	254.7	106.6	2.28

Table P10 - RTAD 100 High Efficiency Low Noise

	Entering Condenser Air Temperature (°C)														
LWT	25			30			35			40			46		
°C	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	352.9	91.0	3.59	331.5	98.2	3.15	309.5	106.2	2.73	287.0	115.1	2.35	259.4	127.0	1.94
7	375.3	94.7	3.68	352.7	102.0	3.23	329.5	110.1	2.81	305.7	119.2	2.42	276.7	131.3	2.00
9	398.2	98.5	3.77	374.4	105.9	3.31	350.0	114.2	2.89	324.9	123.5	2.49	279.9	126.4	2.10
11	421.6	102.4	3.85	396.6	110.0	3.39	370.9	118.5	2.96	344.6	127.9	2.56	285.7	122.8	2.20
13	445.5	106.5	3.92	419.1	114.3	3.45	392.2	122.9	3.02	364.6	132.5	2.62	288.9	117.4	2.33

Table P11 - RTAD 115 High Efficiency Low Noise

	Entering Condenser Air Temperature (°C)														
LWT	25			30			35			40			46		
°C	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	419.6	119.3	3.32	394.8	129.3	2.90	369.4	140.4	2.51	343.3	152.7	2.15	286.7	154.1	1.78
7	447.0	124.2	3.41	420.7	134.3	2.98	393.7	145.7	2.58	366.0	158.2	2.22	291.1	149.8	1.86
9	474.9	129.3	3.48	447.1	139.7	3.05	418.5	151.2	2.65	389.1	164.0	2.28	296.0	146.6	1.93
11	503.5	134.6	3.56	474.0	145.3	3.11	443.7	157.0	2.71	409.5	167.9	2.34	299.9	142.8	2.01
13	532.6	140.2	3.62	501.3	151.1	3.17	469.4	163.0	2.76	420.1	165.4	2.44	303.4	138.4	2.09

Table P12 - RTAD 125 High Efficiency Low Noise

	Entering Condenser Air Temperature (°C)														
LWT	25			30			35			40			46		
°C	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW	C.C. kW	P.I. kW	COP kW/kW
5	489.4	146.4	3.15	460.6	158.8	2.75	431.1	172.4	2.38	400.8	187.4	2.05	309.6	171.3	1.72
7	520.3	152.5	3.23	490.0	165.0	2.82	458.7	178.9	2.45	426.7	194.1	2.11	314.5	166.6	1.80
9	552.1	158.8	3.30	520.0	171.5	2.89	487.0	185.6	2.51	444.6	195.4	2.18	319.8	162.1	1.88
11	584.6	165.3	3.36	550.6	178.3	2.95	515.8	192.6	2.57	450.9	188.8	2.29	324.6	158.6	1.94
13	617.7	172.2	3.42	581.8	185.3	3.00	545.1	199.8	2.62	455.4	181.2	2.40	328.4	154.6	2.02

Notes :

1. Ratings based on sea level altitude and evaporator fouling factor of 0.0176 m^2 K/kW
2. Consult Trane representative for performance at temperatures outside of the ranges shown
3. P.I. kW = compressor power input only.
4. COP = Coefficient of Performance (kW/kW). Power input include compressors, condenser fans and control power.
5. Ratings are based on an evaporator temperature drop of 6°C.
6. Interpolation betweeen points is permissible. Extrapolation is not permitted.
7. Above 40°C ambient, the units will have the High-Ambient option
8. Shaded area reflects Adaptive Control™ Microprocessor control algorithms.

Performance Data

SI Units

Table P13 - RTAD 85 High Ambient

	Entering Condenser Air Temperature (°F)														
LWT	86			95			104			115			125		
F	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER
41	83.1	77.6	11.31	77.9	83.8	9.91	72.4	90.8	8.59	65.6	100.5	7.12	59.2	110.3	5.91
44	87.8	80.0	11.64	82.3	86.3	10.22	76.6	93.3	8.87	69.4	103.0	7.37	62.8	112.9	6.13
45	89.4	80.8	11.75	83.8	87.1	10.32	78.0	94.2	8.97	70.8	103.9	7.45	64.0	113.8	6.21
46	91.0	81.6	11.85	85.3	87.9	10.41	79.5	95.0	9.06	72.1	104.8	7.53	64.6	113.3	6.28
48	94.3	83.3	12.06	88.4	89.6	10.61	82.4	96.8	9.24	74.8	106.6	7.69	65.3	111.6	6.45

Table P14 - RTAD 100 High Ambient

	Entering Condenser Air Temperature (°F)														
LWT	86			95			104			115			125		
F	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER
41	98.1	91.1	11.18	92.0	98.4	9.83	85.7	106.6	8.54	77.8	117.8	7.11	70.5	129.2	5.93
44	103.6	93.7	11.52	97.2	101.1	10.14	90.6	109.4	8.83	82.4	120.8	7.36	71.9	126.8	6.16
45	105.5	94.7	11.63	99.0	102.1	10.24	92.3	110.4	8.93	83.9	121.8	7.44	72.4	125.9	6.24
46	107.3	95.6	11.74	100.8	103.0	10.34	94.0	111.3	9.02	85.5	122.8	7.53	72.8	124.9	6.32
48	111.2	97.5	11.96	104.4	104.9	10.54	97.5	113.3	9.21	88.7	124.9	7.69	73.7	123.0	6.49

Table P15 - RTAD 115 High Ambient

	Entering Condenser Air Temperature (°F)														
LWT	86			95			104			115			125		
F	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER
41	116.3	118.0	10.58	109.3	127.9	9.27	102.1	139.0	8.03	93.0	154.3	6.66	74.2	150.2	5.45
44	123.0	121.4	10.91	115.7	131.5	9.56	108.1	142.7	8.30	98.5	158.2	6.90	75.2	147.4	5.62
45	125.3	122.6	11.02	117.8	132.7	9.66	110.1	144.0	8.39	100.4	159.5	6.98	75.3	146.2	5.67
46	127.6	123.8	11.12	120.0	134.0	9.76	112.2	145.3	8.48	102.3	160.9	7.05	75.9	145.6	5.74
48	132.3	126.3	11.33	124.4	136.5	9.95	116.3	147.9	8.65	106.2	163.6	7.21	76.5	143.6	5.86

Table P16 - RTAD 125 High Ambient

	Entering Condenser Air Temperature (°F)														
LWT	86			95			104			115			125		
F	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER	C.C.Ton	P.I. kW	EER
41	136.2	144.1	10.12	128.1	156.3	8.86	119.7	169.8	7.69	109.2	188.2	6.40	79.4	166.8	5.20
44	143.9	148.4	10.42	135.4	160.7	9.14	126.6	174.4	7.94	115.7	192.9	6.63	80.4	162.8	5.38
45	146.5	149.8	10.52	137.9	162.2	9.23	129.0	175.9	8.03	117.8	194.5	6.70	81.1	162.1	5.45
46	149.1	151.3	10.61	140.4	163.7	9.31	131.3	177.5	8.11	120.0	196.1	6.77	81.0	160.1	5.50
48	154.5	154.3	10.80	145.4	166.8	9.49	136.2	180.6	8.27	113.9	180.2	6.95	81.5	158.0	5.60

Notes :
1. Ratings based on sea level altitude and evaporator fouling factor of 0.0001 ft^2 °F hr/BTU
2. Consult Trane representative for performance at temperatures outside of the ranges shown
3. P.I. kW = compressor power input only.
4. EER = Energy Efficiency Ratio (Btu/watt-hour).Power inputs include compressors, condenser fans and control power.
5. Ratings are based on an evaporator temperature drop of 10.8 °F.
6. Interpolation betweeen points is permissible. Extrapolation is not permitted.
7. Above 40°C ambient, the units will have the High-Ambient option
8. Shaded area reflects Adaptive Control™ Microprocessor control algorithms.

Performance Data

SI Units

Table P17 - ARI Part-Load Values RTAD Standard
(along with ARI 550/590-98 - Note: Info on ARI on www.ari.org)

Unit	% Load	kW cooling	P.I kW	COP (kW/kW)	IPLV (kW/kW)
85	100	270.3	90.7	2.67	3.75
	75	199.9	49.0	3.33	
	50	133.3	26.2	4.18	
	25	60.2	10.4	3.70	
100	100	324.3	110.1	2.69	3.72
	75	240.0	59.7	3.41	
	50	160.0	33.1	4.15	
	25	61.0	13.1	3.25	
115	100	386.2	139.8	2.57	3.78
	75	286.0	76.1	3.29	
	50	190.7	40.1	4.19	
	25	96.3	18.0	4.07	
125	100	440.9	177.9	2.34	3.56
	75	326.6	92.5	3.17	
	50	217.7	49.4	3.98	
	25	92.8	21.0	3.47	

Table P18 - ARI Part-Load Values RTAD High Efficiency
(along with ARI 550/590-98 - Note: Info on ARI on www.ari.org)

Unit	% Load	kW cooling	P.I kW	COP (kW/kW)	IPLV (kW/kW)
85	100	292.6	86.8	3.01	4.19
	75	216.5	47.0	3.74	
	50	144.3	25.5	4.66	
	25	63.3	9.8	4.07	
100	100	345.5	101.7	2.99	3.95
	75	248.6	54.5	3.60	
	50	170.4	30.5	4.51	
	25	62.8	12.3	3.15	
115	100	411.2	132.2	2.82	3.89
	75	304.1	74.7	3.42	
	50	202.7	39.6	4.33	
	25	97.3	17.2	3.94	
125	100	481.2	161.6	2.69	3.62
	75	355.9	89.1	3.33	
	50	167.0	32.3	4.03	
	25	94.2	19.9	3.21	

Table P19 ARI Part-Load Values RTAD High Efficiency Low Noise
(along with ARI 550/590-98 - Note: Info on ARI on www.ari.org)

Unit	% Load	kW cooling	P.I kW	COP (kW/kW)	IPLV (kW/kW)
85	100	279.2	93.9	2.81	4.31
	75	206.7	49.1	3.78	
	50	137.8	26.3	4.73	
	25	62.4	10.3	4.73	
100	100	329.5	110.1	2.81	4.14
	75	244.0	58.5	3.71	
	50	148.6	28.1	4.68	
	25	62.1	12.7	3.74	
115	100	393.7	145.7	2.58	3.88
	75	291.4	79.5	3.36	
	50	194.3	41.9	4.27	
	25	96.1	18.4	4.33	
125	100	458.7	178.9	2.45	3.67
	75	339.6	94.8	3.27	
	50	226.4	50.8	4.09	
	25	92.9	21.0	3.60	

Performance Data

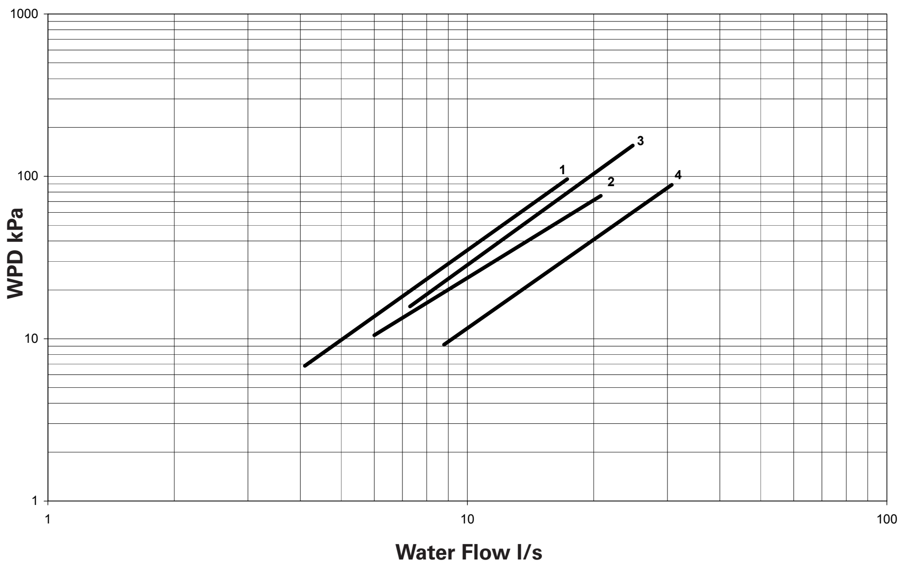
English Units

Table P20 - ARI Part-Load Values RTAD High Ambient
(along with ARI 550/590-98 - Note: Info on ARI on www.ari.org)

Unit	% Load	Tons	P.I kW	EER	IPLV
85	100	83.8	87.1	10.32	14.3
	75	61.6	47.0	12.78	
	50	41.0	25.5	15.90	
	25	18.0	9.8	13.89	
100	100	99.0	102.1	10.24	13.5
	75	70.7	54.5	12.29	
	50	48.5	30.5	15.38	
	25	17.9	12.3	10.75	
115	100	117.8	132.7	9.66	13.3
	75	86.5	74.7	11.68	
	50	57.7	39.6	14.78	
	25	27.7	17.2	13.43	
125	100	137.9	162.2	9.23	12.4
	75	101.2	89.1	11.36	
	50	47.5	32.3	13.75	
	25	26.8	19.9	10.94	

Performance Data

Figure 4 - Evaporator Water Pressure Drops (SI units)



Legend				
Curve	RTAD Std	RTAD HE	RTAD HE LN	RTAD HA
1	85	***	***	***
2	100	85	85	85
3	115	100	100	100
4	125	115 - 125	115 - 125	115 - 125

Performance Data

Table P21 - Performance Data Adjustment Factors

Fouling Factor	Chilled Water Temp. drop °C	Altitude Sea Level Cooling Capacity	Evp. Flow Rate	Compr. kW Input	600 m Cooling Capacity	Evp. Flow Rate	Compr. kW Input	1200 m Cooling Capacity	Evp. Flow Rate	Compr. kW Input	1800 m Cooling Capacity	Evp. Flow Rate	Compr. kW Input
0.0176 m² K/kW	4.4	1.000	1.249	1.000	0.996	1.245	1.004	0.991	1.240	1.007	0.987	1.234	1.014
	5.6	1.000	1.000	1.000	0.997	0.996	1.004	0.993	0.992	1.007	0.988	0.988	1.015
	6.7	1.001	0.835	1.001	0.997	0.832	1.004	0.993	0.828	1.009	0.988	0.824	1.015
	7.8	1.003	0.716	1.001	0.999	0.714	1.004	0.994	0.711	1.009	0.990	0.708	1.015
	8.9	1.004	0.628	1.001	1.000	0.626	1.005	0.997	0.623	1.009	0.991	0.620	1.016
0.044 m² K/kW	4.4	0.988	1.235	0.996	0.984	1.230	1.000	0.980	1.225	1.004	0.975	1.220	1.010
	5.6	0.988	0.989	0.998	0.986	0.985	1.000	0.981	0.981	1.004	0.977	0.976	1.011
	6.7	0.990	0.825	0.998	0.987	0.822	1.000	0.983	0.819	1.005	0.978	0.815	1.011
	7.8	0.991	0.708	0.998	0.988	0.706	1.001	0.984	0.703	1.005	0.980	0.700	1.011
	8.9	0.993	0.621	0.999	0.990	0.619	1.001	0.986	0.617	1.006	0.981	0.614	1.012

Table P22 - Ethylene Glycol Pressure Drop Correction Factor

Brine Temp °C	Percent Ethylene Glycol 0	10	20	30	40	50
-7	1.00	1.06	1.13	1.24	1.38	1.54
-4	1.00	1.09	1.16	1.26	1.39	1.55
-1	1.00	1.12	1.19	1.28	1.41	1.56
2	1.00	1.14	1.21	1.30	1.42	1.57
4	1.00	1.17	1.23	1.32	1.44	1.58

Table P23 - Propylene Glycol Pressure Drop Correction Factor

Brine Temp °C	Percent Propylene Glycol 0	10	20	30	40	50
-7	1.00	1.14	1.23	1.30	1.39	1.53
-4	1.00	1.17	1.25	1.31	1.39	1.52
-1	1.00	1.20	1.27	1.33	1.40	1.52
2	1.00	1.23	1.29	1.34	1.40	1.52
4	1.00	1.26	1.31	1.36	1.41	1.52

Figure 5 - Ethylene Glycol Performance Factors

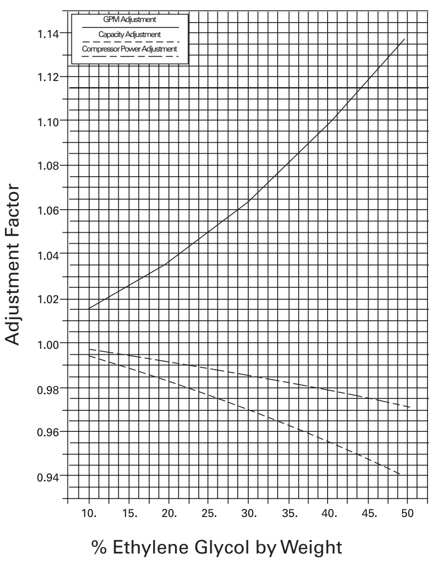


Figure 6 - Propylene Glycol Performance Factors

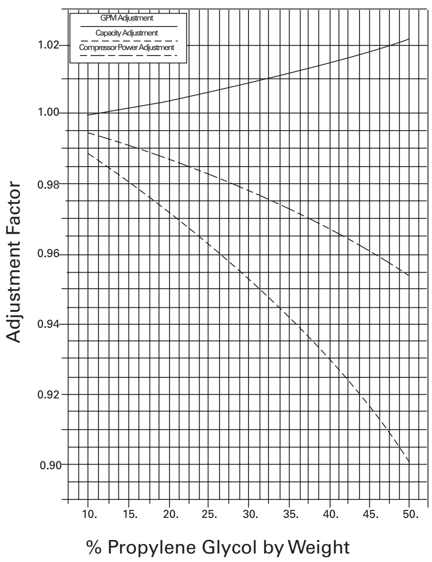
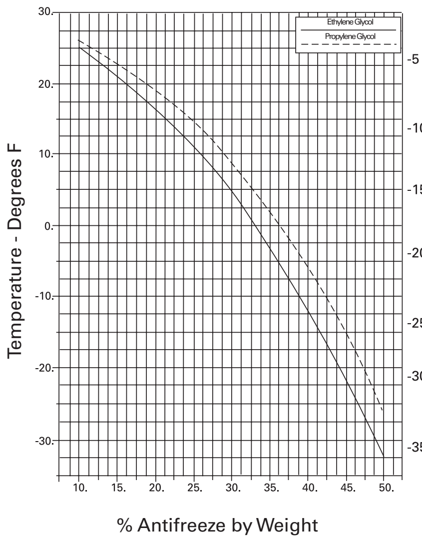


Figure 7 - Ethylene Glycol and Propylene Glycol Freeze Point



Controls

Chiller Unit Controls

Trouble-Free Installation, Start-Up and Operation

Adaptive Control means the Unit Control Module (UCM-CLD) directly senses the control variables that govern operation of the chiller: motor current draw, evaporator temperature, condenser temperature, etc. When any of the variables approaches a limit condition where the unit may be damaged or shut down on a safety, the UCM takes corrective action to avoid shutdown and keep the chiller operating. It does this through combined actions of compressor slide valve modulation, electronic expansion valve modulation and fan staging.
Additionally, the UCM optimizes total unit power consumption during normal operating conditions. No other chiller control system in the marketplace duplicates this performance.

Safety Controls

A centralized microcomputer offers a higher level of machine protection. Since the safety controls are smarter, they limit compressor operation to avoid compressor or evaporator failures, thereby minimizing nuisance shutdown. During abnormal operating conditions, the UCM will continue to optimize chiller performance by taking the corrective action necessary to avoid shutdown. This keeps cooling capacity available until the problem can be solved. Whenever possible, the chiller is allowed to perform its function; make chilled water. In addition, microcomputer controls allow for more types of protection such as over and under voltage! Overall, the safety controls help keep the building running and out of trouble.

The End Of Nuisance Trip-Outs And Unnecessary Service Calls

Unnecessary service calls and unhappy tenants are avoided. The unit does not nuisance trip or unnecessarily shut down. Only when the UCM has exhausted the corrective actions it can take and the unit is still violating an operating limit will the unit shut down. CONTROLS ON OTHER CHILLERS TYPICALLY SHUT DOWN THE CHILLER, QUITE PROBABLY 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 day in August. A hot day is just when comfort cooling is needed the most. In contrast, the air-cooled Series R chiller with an Adaptive Control microprocessor will stage fans on, modulate electronic expansion valve, and modulate slide valve as it approaches a high pressure cutout. Thereby KEEPING THE CHILLER ON-LINE JUST WHEN YOU NEED IT THE MOST.

Figure 8 - Unit control module with Clear Language Display Keypad (UCM-CLD)

Generic Building Automation System Controls

Simple Interface With Other Control Systems

Microcomputer controls afford simple interface with other control systems, such as time clocks, building automation systems and ice storage systems. Wiring to the unit can be as simple as two wires! This means you can have the flexibility to meet job requirements while not having to learn a complicated control system.

Monitoring And Diagnostics

Since the microcomputer provides all control functions, it can easily indicate such parameters as leaving chilled water temperature and capacity stage. If a failure does occur, one of over 90 individual diagnostic and operating codes will be used to indicate the problem, giving more specific information about the failure. All of the monitoring and diagnostic information is displayed directly on a microcomputer display.

Controls

Interface With The Trane Integrated Comfort™ System (ICS)
When the air-cooled Series R® chiller is used in conjunction with a Trane Tracer® system, the unit can be monitored and controlled from a remote location. The air-cooled Series R chiller can be controlled to fit into the overall building automation strategy by using time of day scheduling, timed override, duty cycling, demand limiting, and chiller sequencing. A building owner can completely monitor the air-cooled Series R chiller from the Tracer system, as all of the monitoring information indicated on the microcomputer can be read off the Tracer system display. In addition, all the powerful diagnostic information can be read back at the Tracer system. Best of all, this powerful capability comes over a single twisted pair of wires!
Air-cooled Series R chillers can interface with many different external control systems, from simple stand- alone units to ice making systems. Each unit requires a single-source, three-phase power supply, a 115-volt control power transformer handles both the evaporator heat tape and the unit controls. The control transformer is directly fed from the 400/3/50 supply in the control panel. For basic stand-alone applications, the interface with outside control is no different than for other Trane chillers. However, the RTAD units have many features that can be used to interface with building control systems.

Standard Features:

External Auto/Stop
A job site provided contact closure will turn the unit on and off.
Note: Do not use the chilled water pump to stop the chiller.

Chilled Water flow Interlock
A job site provided contact closure from a chilled water pump contactor or a flow switch is required and will allow unit operation if a load exists. This feature will allow the unit to run in conjunction with the pump system.

External Interlock
A job site supplied contact opening wired to this input will turn the unit off and require a manual reset of the unit microcomputer. This closure is typically triggered by a job site supplied system such as a fire alarm.

Chilled Water Pump Control
Unit controls provide an output to control chilled water pump(s). One contact closure to the chiller is all that is required to initiate the chilled water system.

Remote Running and Alarm Indication Contacts
The unit provides three single-pole/double-throw contact closures to indicate that a failure has occurred, if any compressors are running, or if the compressors are running at maximum capacity. These contact closures may be used to trigger job site supplied alarm lights or alarm bells.

Optional Features:

Communication Interface (CSR Communication Interface Option)
Capability for communication with Trane Tracer ® Building Automation Systems or Remote Display

External Chilled Water Set point
Allows the external setting independent of the front panel setpoint by a 2-10 VDC input, or a 4-20 mA input.

External Current Limit Set point
Allows the external setting independent of the front panel setpoint by a 2-10 VDC input, or a 4-20 mA input.

Ice Making Control
Provides interface with ice making control systems.

Chilled Water Temperature Reset
Reset can be based on return water temperature or outdoor air temperature.

Interface with other control systems

Stand-Alone Unit
Interface to stand-alone units is very simple; 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.

Note: Do not use the chilled water pump to stop the chiller.

Required Features
External Auto/Stop (Standard)
Chilled Water flow Interlock (Standard)

Additional Features That May Be Used
Remote Running and Alarm Indication Contacts (provided on the UCM-CLD main module)
External Interlock (Standard)
Chilled Water Temperature Reset

External Trane Devices Required - None

Note: All wiring outside the unit is supplied at the job site.

TRANE Integrated Comfort™ System Interface

A single twisted pair of wires tied directly between the air-cooled Series R ® chiller and a Tracer ® system provides control, monitoring and diagnostic capabilities. Control functions include auto/stop, adjustment of leaving water temperature set point, compressor operation lockout for kW demand limiting and control of ice making mode. The Tracer system reads monitoring information such as entering and leaving evaporator water temperatures and outdoor air temperature. Over 60 individual diagnostic codes can be read by the Tracer system. In addition, the Tracer system can provide sequencing control for two to six units on the same chilled water loop. Pump sequencing control can be provided from the Tracer system. Tracer ICS is not available in conjunction with the remote display or the external set point capability.

Required Features
Communications Interface (Requires CSR Communications Interface, option)

Additional Features That May Be Used
Chilled Water Temperature Reset
Ice Making Control

External Trane Devices Required
Tracer Summit® or Tracer Chiller Plant Control

Interface With Other Building Automation Systems

The air-cooled Series R chillers can interface with non-Trane building automation systems via hard wire connections. Several capabilities may be utilized:

Required Features
External Auto/Stop (Standard)

Additional Features That May Be Used
External Interlock (Standard)
External Demand Limit (Set point) (Requires CSR Communications Interface, option)
Remote Running and Alarm Indication Contacts (Standard)
External Chilled Water Set point (Requires CSR Communications Interface, option)
Chilled Water flow Interlock (Standard)

External Trane Devices Required -
None

Ice Making Systems

An ice making option may be ordered with the air-cooled Series R® chiller. The unit will have two operating modes, ice making and normal daytime cooling. In the ice making mode, the air-cooled Series R chiller will operate at full compressor capacity until the return chilled fluid temperature entering the evaporator meets the ice making set point. This ice making set point is manually adjusted on the unit's microcomputer. Two input signals are required to the air-cooled Series R chiller for the ice making option. The first is an auto/stop signal for scheduling and the second is required to switch the unit in between the ice making mode and normal daytime operation. The signals are provided by a remote job site building automation device such as a time clock or a manual switch. In addition, the signals may be provided over the twisted wire pair from a Tracer ® system.

Required Features
External Auto/Stop (Standard)
Ice Making Control (Requires CSR Communications Interface, option)

Additional Features That May Be Used
Remote Running and Failure Indication Contacts
Communications Interface (For Tracer Systems)
Chilled Water Temperature Reset (Indoor zone reset not available with ice making option).

External Trane Devices Required -
None

Controls

Remote Display

The remote display allows the operator to monitor chiller operation from a location within the building. Over 60 essential chiller operating parameters can be transmitted between the unit control module on the chiller and the remote display via a bi-directional communications link. Only one twisted wire pair is required between the chiller and the remote display. In addition to monitoring chiller operation, alarms and unit diagnostics can be read from the remote display. Furthermore, the chilled water temperature set point can be adjusted and the chiller can be turned on or off from the remote display.

Required Features
Communications Interface

Additional Features That May Be Used
External Interlock (Standard)
Chilled Water Temperature Reset
Chilled Water flow Interlock (Standard)
Remote Running and Failure Indication Contacts

External Trane Devices Required
Remote Display Panel

Figure 9 - Remote display panel

Job Site Data

Table J-1 - Customer Wire Selection

Voltage 400/3/50	Unit without Disconnect Switch Wire Selection Size to Main Terminal Block		Unit with Disconnect Switch Wire Selection Size to Disconnect Switch		
Unit Size	Minimum cable size mm²	Maximum cable size mm²	Disconnect Switch Size (Amps)	Minimum cable size mm²	Maximum cable size mm²
RTAD STANDARD					
85	95 mm²	2x300 mm²	250 A	95 mm²	150 mm²
100	95 mm²	2x300 mm²	400 A	185 mm²	240 mm²
115	95 mm²	2x300 mm²	400 A	185 mm²	240 mm²
125	95 mm²	2x300 mm²	500 A	240 mm²	2x240 mm²
RTAD HIGH EFFICIENCY/HIGH AMBIENT					
85	95 mm²	2x300 mm²	400 A	185 mm²	240 mm²
100	95 mm²	2x300 mm²	400 A	185 mm²	240 mm²
115	95 mm²	2x300 mm²	400 A	185 mm²	240 mm²
125	95 mm²	2x300 mm²	500 A	240 mm²	2x240 mm²
RTAD HIGH EFFICIENCY/LOW NOISE					
85	95 mm²	2x300 mm²	250 A	95 mm²	150 mm²
100	95 mm²	2x300 mm²	400 A	185 mm²	240 mm²
115	95 mm²	2x300 mm²	400 A	185 mm²	240 mm²
125	95 mm²	2x300 mm²	500 A	240 mm²	2x240 mm²

Electrical Data

Table E-1 - Electrical Data 400/3/50

				Unit Wiring			
Unit size	Nbr of Power Connections	Maximum Amps (1)	Starting Amps (2)	Power Factor (5)	Disconnect Switch Size	Compressor Fuse Size (A)	Evaporator heater (kW)
RTAD STANDARD							
85	1	229	250	0.89	250 A	6 x 125 A	0.217
100	1	279	305	0.86	400 A	6 x 160 A	0.217
115	1	324	359	0.89	400 A	6 x 200 A	0.217
125	1	390	426	0.90	500 A	6 x 250 A	0.217
RTAD HIGH EFFICIENCY/ HIGH AMBIENT							
85	1	229	250	0.89	400 A	6 x 160 A	0.217
100	1	288	314	0.86	400 A	6 x 200 A	0.217
115	1	333	368	0.89	400 A	6 x 250 A	0.217
125	1	408	444	0.90	500 A	6 x 250 A	0.217
RTAD HIGH EFFICIENCY/LOW NOISE							
85	1	218	239	0.89	250 A	6 x 125 A	0.217
100	1	273	299	0.86	400 A	6 x 160 A	0.217
115	1	318	353	0.89	400 A	6 x 200 A	0.217
125	1	389	425	0.90	500 A	6 x 250 A	0.217

Table E-1 Continued, Electrical Data 400/3/50

						Motor Data							
		Compressor (Each)						Fans (Each)				Control	
Unit		RLA Amps		Max Amps (3)		Starting Amps (4)					Fans fuse		(400V)
Size	Qty	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Qty	kW	FLA	size (A)	VA	A
RTAD STANDARD													
85	2	75	75	99	99	144	144	6	1.88	4.5	3 x 50 A	1600	4
100	2	94	94	124	124	180	180	6	1.88	4.5	3 x 50 A	1600	4
115	2	111	111	147	147	217	217	6	1.88	4.5	3 x 50 A	1600	4
125	2	136	136	180	180	259	259	6	1.88	4.5	3 x 50 A	1600	4
RTAD HIGH EFFICIENCY/HIGH AMBIENT													
85	2	75	75	99	99	144	144	6	1.88	4.5	3 x 50 A	1600	4
100	2	94	94	124	124	180	180	8	1.88	4.5	3 x 50 A	1600	4
115	2	111	111	147	147	217	217	8	1.88	4.5	3 x 50 A	1600	4
125	2	136	136	180	180	259	259	10	1.88	4.5	3 x 50 A	1600	4
RTAD HIGH EFFICIENCY/LOW NOISE													
85	2	75	75	99	99	144	144	6	0.85	2.6	3 x 50 A	1600	4
100	2	94	94	124	124	180	180	8	0.85	2.6	3 x 50 A	1600	4
115	2	111	111	147	147	217	217	8	0.85	2.6	3 x 50 A	1600	4
125	2	136	136	180	180	259	259	10	0.85	2.6	3 x 50 A	1600	4

Notes:
1. Maximum Compressors FLA + all fans FLA + control Amps
2. Starting Amps of the circuit with the largest compressor circuit including fans plus RLA of the second circuit including fans + control Amps
3. Maximum FLA per compressor.
4. Compressors starting Amps, Star delta start.
5. Compressor Power Factor

Dimensional Data

	RTAD STD & HE RTAD 85–100–115–125	C 5709–7090 1/1 Date: 05/07/2001 Rev. / CAO Std

REFROIDISSEURS DE LIQUIDE / WASSERKUEHLMASCHINEN / LIQUID CHILLERS

1	CONNEXION ENTREE D'EAU EVAPORATEUR	WASSER–EINTRITT–VERDAMPFER	EVAPORATOR WATER INLET CONNECTION
2	CONNEXION SORTIE D'EAU EVAPORATEUR	WASSER–AUSTRITT–VERDAMPFER	EVAPORATOR WATER OUTLET CONNECTION
3	ARMOIRE DE DEMARRAGE	SCHALTSCHRANK	STARTER PANEL
4	ARMOIRE DE CONTROLE	STEUERSCHRANK	CONTROL PANEL
5	ACCES RACCORDEMENT CLIENT (155 x 400)	KABELEINFUEHRUNG (155 x 400)	POWER SUPPLY INLET (155 x 400)
6	POINT DE LEVAGE Ø45	TRANPORT–OESEN Ø 45	RIGGING EYES Ø 45
7	CHARGE DE FLUIDE FRIGORIGENE (Kg) R134a	KAELTEMITTEL–FUELLUNG (Kg) R134a	REFRIGERANT CHARGE (Kg) R134a
8	CHARGE D'HUILE (Litres)	OELFUELLUNG (Liter)	OIL CHARGE (Litres)
9	AIRE CONSEILLEE POUR MAINTENANCE	WINDEST–WANDABTAND (ZUR WARTUNG)	MINIMUM CLEARANCE (FOR MAINTENANCE)
10	AIRE CONSEILLEE POUR DETUBAGE DE L'EVAPORATEUR	MINDEST–WANDABSTAND (VERDAMFER – AUSBAU)	MINIMUM CLEARANCE (EVAPORATOR TUBES REMOVAL)
11	AIRES NECESSAIRE POUR ENTREE D'AIR	MINDEST WANDABSTAND (LUFTEINTRITT)	MINIMUM CLEARANCE (AIR ENTERING)
12	MASSE EN FONCTIONNEMENT (Kg)	BETRIEBSGEWICHT (Kg)	OPERATING WEIGHT (Kg)
13	NOMBRE DE VENTILATEURS	ANZAHL LUEFTER	NUMBER OF FANS

OPTIONS / ZUBEOER / OPTIONS

14	SECTIONNEUR PUISSANCE	SCHALTSCHRANK HAUPTSCHALTER	POWER DISCONNECT SWITCH
15	AMORTISSEURS	DAEMPFER	ISOLATORS
16	ATTENUATEUR DE SON	SCHALLDAEMMENDE VERDICHTER – VERKLEIDUNG	COMPRESSOR SOUND ATTENUATOR
17	MANOMETRES	MANOMETER	PRESSURE GAUGES

RERIGERATO DI LIQUIDO / WATERKOELMACHINE / ENFRIADORA DE LIQUIDO

1	COLLEGAMENTO INGRESSO ACQUA EVAPORATORE	VERDAMPFER WATERINTREDE	CONEXION DE ENTRADA DE AGUA AL EVAPORADOR
2	COLLEGAMENTO USCITA ACQUA EVAPORATORE	VERDAMPFER WATERUITTREDE	CONEXION DE SALIDA DE AGUA DEL EVAPORADOR
3	PANNELLO D'AVVIAMENTO	STARTERPANEEL	PANEL DE ARRANQUE
4	PANNELLO DI CONTROLLO	REGELPANEEL	PANEL DE CONTROL
5	PASSAGGIO ALIMENTAZIONE ELECTTRICA (155 x 400)	DOORVOER KRACHTSTROOMAANSLUITING (155 x 400)	ESPACIO PARA CONEXION CLIENTE (155 x 400)
6	GOLFARI Ø 45	HIJSOGEN Ø 45	PUNTOS DE ELEVACION Ø 45
7	CARICA DI FLUIDO FRGORIGENO (Kg) R134a	KOUDEMIDDELVULLING (Kg) R134a	CARGA DE REFRIGERANTE (Kg) R134a
8	CARICA D'OLIO (Litri)	OLIEVULLING (Liters)	CARGA DE ACEITE (Litros)
9	MINIMO SPAZIO DI SERVIZIO	MINIMUM VRIJE RUIMTE (VOOR ONDERHOUD)	ESPACIO LIBRE MINIMO PARA MANTENIMIENTO
10	SPAZI MINIMI RICHIESTI PER LA RIMOZIONE TUBI EVAPORATORE	MINIMUMAFSTAND (VERVANGENVERDAMPER PIJPEN)	ESPACIO LIBRE PARA EXTRA
11	SPAZIO PER ARIA IN ENTRATA	MINIMALE VRIJE RUIMTE VOOR LUCHTINTREDE	ESPACIO LIBRE MINIMO PARA TOMA DE AIRE
12	PESO IN FUNZIONAMENTO (Kg)	BETRIJFSGEWICHT (Kg)	PESO EN OPERACION (Kg)
13	NUMERO DI VENTILATORI	AANTAL VENTILATOREN	NUMERO DE VENTILADORES

OPZIONI / TOEBEHOREN / OPCIONES

14	SEZIONATORE DI POTENZA	HOOFDSCHAKELAAR	SECCIONADOR DE FUERZA
15	ANTIVIBRANTI	DEMPERS	AMORTIGUATORES
16	CUFFIA SONOASSORBENTE	GELUIDDEMPENDE OMKASTING	AISLAMIENTO ACUSTICO
17	MANOMETRI	MANOMETERS	MANOMETROS

RTAD			12 *	13	8	7	1 2
085	STD	Al	2660	6	2 x 5	26 + 25	ø5"
		Cu	2990				DN 125–PN 16
	HE	Al	3240	6		24 + 26	ø6"
		Cu	3680				DN 150–PN16
100	STD	Al	3100	6	2 x 6		ø6"
		Cu	3385				DN 150–PN16
	HE	Al	3370	8		33 + 36	ø6"
		Cu	3810				DN 150–PN16
115	STD	Al	3560	6	2 x 8		ø6"
		Cu	3995				DN 150–PN16
	HE	Al	3905	8	2 x 9	42 + 45	ø6"
		Cu	4455				DN 150–PN16
125	STD	Al	3570	6		34 + 37	ø6"
		Cu	4010				DN 150–PN16
	HE	Al	4000	10		42 + 45	ø6"
		Cu	4555				DN 150–PN16

* LN = HE + 100 kg

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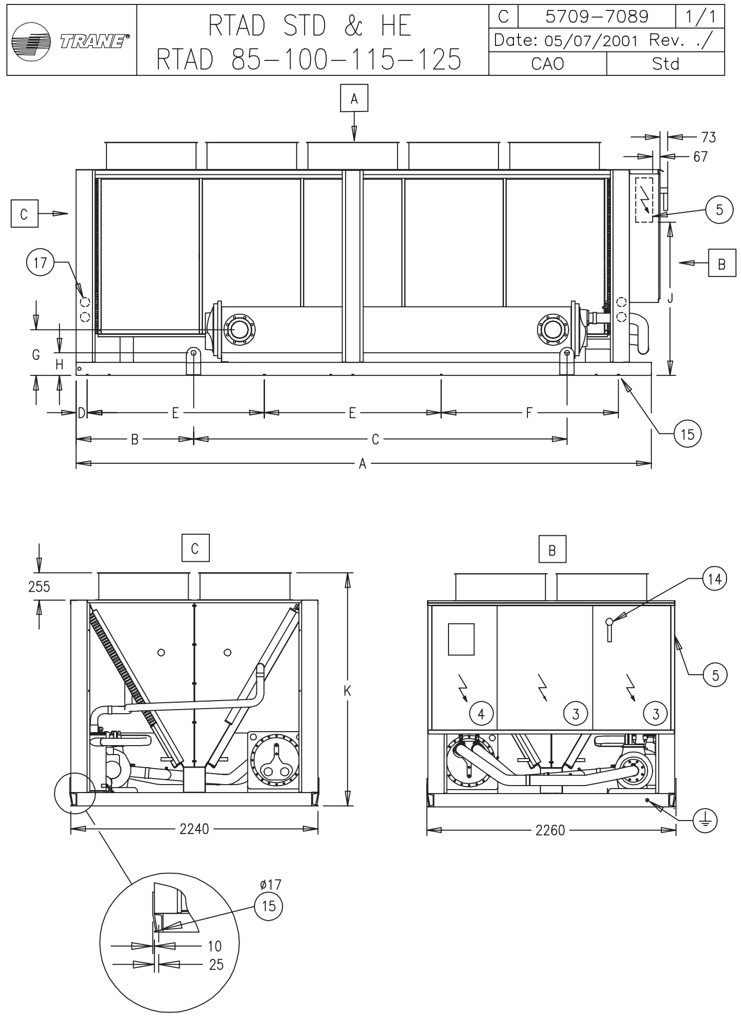
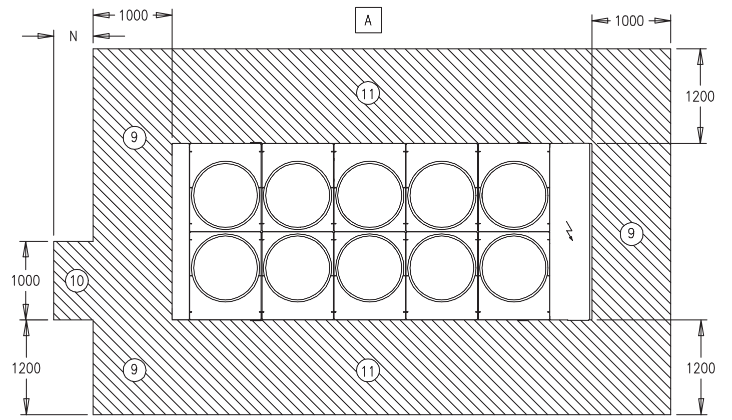
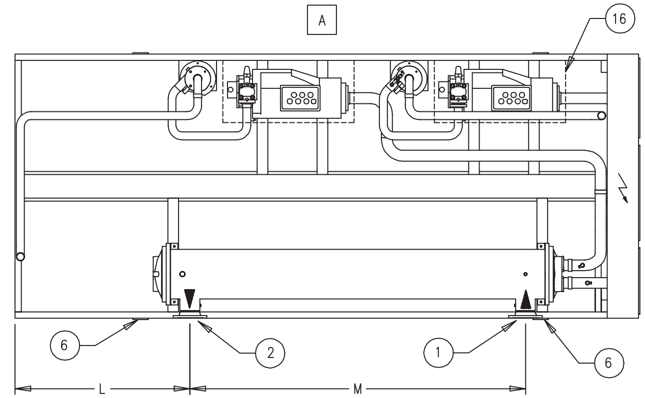
Note: for High Efficiency Low noise and High ambient units, use dimensions of the High efficiency units.

Dimensional Data







RTAD	A	B	C	D	E	F	G	H	J	K	L	M	N
85 STD	3381	838	1778		1490	----	373	185	1372	2095	538	1792	1000
100-115-125 STD 85-100 HE	4300	965	2540	100	1950	----	395	185	1372	2095	564	2844	2000
115-125 HE	5219	1245	3302		1606	1606	415	205	1392	2115	1483	2844	1000

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Note: for High Efficiency Low noise and High ambient units, use dimensions of the High efficiency units.

Mechanical Specifications

General
Units are leak and pressure tested at 35 bar high side, 19 bar low side, then evacuated and charged. Packaged units ship with a full operating charge of oil and refrigerant.
Unit panels, structural elements and control boxes are constructed of galvanized steel and mounted on a welded structural steel base. Unit panels and control boxes are finished with an air-dry paint RAL 1019.

Evaporator
The evaporator is a tube-in-shell heat exchanger design with internally finned copper tubes roller expanded into the tube sheet. The evaporator is designed, tested and stamped in accordance with the appropriate pressure vessel code approval for a refrigerant side working pressure of 32 bar. The evaporator is designed for a water side working pressure of 14 bar. Water connections are flanged. The evaporator has one water pass with a series of internal baffles. Each shell includes a vent, a drain and fittings for temperature control sensors and is insulated with 3 /4 -inch Armaflex II or equal insulation (K=0.26). Heat tape is provided to protect the evaporator from freezing at ambient temperatures down to -18°C.

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 35 bar. Direct-drive vertical discharge air foil ZephyrWing condenser fans are dynamically balanced. Three-phase condenser fans motors with permanently lubricated ball bearing are provided.
Standard units will start and operate between of 4°C (39 F) to the maximum possible ambient of the selected unit.

Compressor and Lube Oil System
The rotary screw compressor is semi-hermetic, direct drive, 3000 rpm, with capacity control slide valve, a load/unload valve, rolling element bearings, differential refrigerant pressure oil pump, oil filter and oil heater. The motor is a suction gas cooled, hermetically sealed, two-pole squirrel cage induction motor. Oil separator devices are provided separate from the compressor. Check valves in the compressor discharge and lube oil system are provided.

Refrigeration Circuits
Each unit has two refrigerant circuits, with one rotary screw compressor per circuit. Each refrigerant circuit includes a liquid line shutoff valve, removable core filter drier, charging port and an electronic expansion valve. Fully modulating compressors and electronic expansion valves provide variable capacity modulation over the entire operating range.

Unit Controls
All unit controls are housed in a weather-tight enclosure with hinged doors to allow for customer connection of power wiring and remote interlocks.
All controls, including sensors, are factory mounted and tested prior to shipment. All cataloged units comply to EN 60204 and are EMC compatible.
Microcomputer controls provide all control functions including start-up and shut down, leaving chilled water temperature control, compressor and electronic expansion valve modulation, fan sequencing, anti-recycle logic, automatic lead/lag compressor starting and load limiting.
The unit control module, utilizing Adaptive Control™ microprocessor, automatically takes action to avoid unit shutdown due to abnormal operating conditions associated with low refrigerant temperature, high condensing temperature and motor current overload. Should the abnormal operating condition continue until a protective limit is violated, the unit will be shut down.
Unit protective functions include loss of chilled water flow, evaporator freezing, loss of refrigerant, low refrigerant pressure, high refrigerant pressure, reverse rotation, compressor starting and running over current, phase loss, phase imbalance, phase reversal, and loss of oil flow.
A menu driven digital display indicates over 20 operating data points including chilled water set point, current limit Set point, leaving chilled water temperature, evaporator and condenser refrigerant pressures and temperatures. Over 60 diagnostic checks are made and displayed when a problem is detected. The digital display can be read and advanced on the unit without opening any control panel doors.
Standard power connections include main three phase power and two 115 volt single phase power connections for control power and heat tape.

Starters
Starters are housed in a weathertight enclosure with removable cover plate to allow for customer connection of power wiring.
Wye Delta closed transition starters are standard on all RTAD units.

Notes

Notes

Notes

For additional information, contact:
Distributor/Installer stamp

Quality Management System Approval

Literature Order Number	RLC-PRC015-E4
Date	08/01
New	
Stocking Location	Europe

The Trane Company
An American Standard Company
www.trane.com

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

Société Trane – Société Anonyme au capital de 61 005 000 Euros – Siege Social: 1 rue des Amériques – 88190 Golbey – France – Siret 306 050 188-00011 – RSC Epinal B 306 050 188
Numéro d'identification taxe intracommunautaire: FR 83 3060501888