



Product Catalog

Series R® Helical Rotary Liquid Chillers

Model RTWD Water-Cooled
80 to 250 Nominal Tons (50 Hz)
Made in USA



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TRANE
TECHNOLOGIES



Introduction

To meet a wide range of applications in the 65-240 ton water-cooled market, Trane is proud to offer the model RTWD helical-rotary liquid chiller. This next-generation chiller provides application versatility, ease of installation, control precision, reliability, energy-efficiency, and operational cost-effectiveness. The chiller is designed to deliver proven Series R® performance, plus all the benefits of an advanced heat transfer design with two low-speed, direct-drive compressors.

Important Design Advances and Features

EcoWise™ RTWD is the newest member of Trane's EcoWise™ portfolio of products, designed to lower environmental impact with next-generation, low global warming potential (GWP) refrigerant and high efficiency operation. RTWD chillers are designed to operate with either R-134a or DuPont™ Opteon® (R-513A), a next generation refrigerant with 55 percent lower GWP than R-134a.

- Higher full-load energy efficiency that meets ASHRAE 90.1 and reduces both operating and life-cycle costs.
- Variable evaporator flow compensation for improved control stability with energy saving variable flow applications.
- Single chiller time of day scheduling communication option for easier control of small jobs.
- Dual independent refrigerant circuits.

The industrial-grade design of the Series R helical-rotary chiller is ideal for both industrial and commercial markets, in applications such as office buildings, hospitals, schools, retail buildings, and industrial facilities. The reliable compressors, wide operating temperature range, advanced controls, electronic expansion valve, short anti-recycle timers, and industry-leading efficiencies mean that this latest Trane Series R chiller is the perfect choice for tight temperature control in almost any application temperatures, and under widely varying loads.

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Revision History

- Updated Electrical Connections chapter.
- Minor updates.



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Features and Benefits

Reliability

- The Trane helical rotary compressor is a proven design resulting from years of research and thousands of test hours, including extensive testing under extraordinarily severe operating conditions.
- Trane is the world's largest manufacturer of large helical rotary compressors, with more than 240,000 compressors installed worldwide.
- Direct drive, low-speed compressors—a simple design with only four moving parts—provides maximum efficiency, high reliability, and low maintenance requirements.
- Suction gas-cooled motor stays at a uniformly low temperature for long motor life.
- Electronic expansion valve, with fewer moving parts than alternative valve designs, provides highly reliable operation.

High Performance

- Advanced design enables chilled water temperature control to $\pm 0.5^{\circ}\text{F}$ (0.28°C) for flow changes up to 10 percent per minute, plus handling of flow changes up to 30 percent per minute for variable flow applications.
- Two minute stop-to-start and five minute start-to-start anti-recycle timer allows tight chilled water temperature control in constant or transient low-load applications.
- High compressor lift capabilities for use with heat recovery and waterside heat pump applications allows highly efficient system design with minimal operational concerns.
- Tight water temperature control extends to operation of multiple chillers in parallel or series configurations, offering further system design flexibility for maximum efficiency.
- Optional LonTalk[®]/Tracer Summit communications interface provides excellent, trouble-free interoperability.

Life Cycle Cost-Effectiveness

- Precise compressor rotor tip clearance ensures optimal efficiency.
- Condenser and evaporator tubes use the latest heat transfer technology for increased efficiency.
- Electronic expansion valve enables exceptionally tight temperature control and extremely low superheat, resulting in more efficient full-load and part-load operation than previously available.
- Chilled water reset based on return water temperature is standard.
- Electrical current-limiting is available as an option.

Application Versatility

- **Industrial/low temperature process cooling** – Excellent operating temperature range and precise control capabilities enable tight control with single chiller or series configuration.
- **Ice/thermal storage** – Specifiers and operators benefit from dual setpoint control and industry-leading temperature, efficiency, and control capabilities, plus outstanding support through partnership with Calmac, a strong Trane partner providing proven installation examples, templates, and references that minimize design time and energy costs.
- **Heat recovery** – Maximum condenser temperature exceeds those of previous technologies, providing hot water and tight control that minimizes operating costs for the chilled water plant and boiler/hot water heater, while also providing consistent dehumidification.
- **Water to water heat pump** – For multi-chiller systems where there is a base or year-round heating load the RTWD can be used as a water side heat pump by utilizing ground or surface water as a heat

source. Leaving condenser temperature control option allows for the chiller to be used and controlled primarily for the heat produced in the condenser.

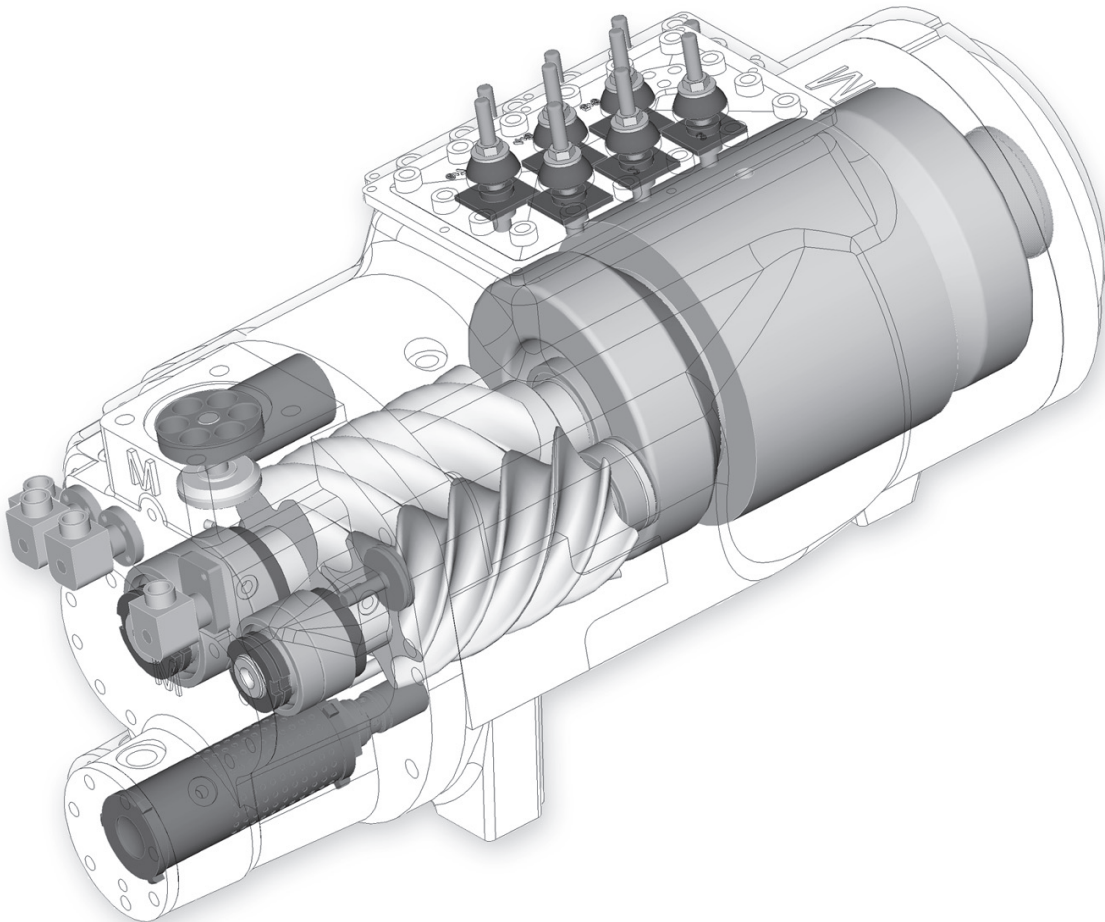
- **Dry Cooler** – Allows for use with a closed condenser loop system that minimizes the potential for cross-contamination of the condenser loop.
- **Variable primary flow** – Variable evaporator flow compensation allows multi-chiller systems to vary the flow of water throughout the entire system (from the evaporator through the cooling coils). This feature also provides additional system efficiency as the number of pumps and the flow rate in the system are reduced. Standard 2 pass or optional 3 pass evaporator allows for a wider range of flow capabilities.
- **Series chiller configuration** – For two-chiller systems all the system water passes through the evaporators and/or condensers of both chillers to take advantage of system efficiency gains due to thermodynamic staging as well as downsizing the upstream chiller.
- **EarthWise™ system** – Low flow and high temperature differential installations allow for reduced pump and cooling-tower energy by decreasing the amount of water flow pumped through the system. This results in downsizing of all HVAC and ancillary equipment which provides installation and operational savings.

Simple, Economical Installation

- All units fit through standard double-width doors and most units fit through single width doors. Units are designed with bolt-together construction for disassembly to fit through smaller openings.
- Small footprint saves valuable equipment room space and alleviates access concerns for most retrofit jobs.
- Lightweight design simplifies rigging requirements, further reducing installation time requirements and costs.
- Full factory refrigerant and oil charges reduce required field labor, materials, and installation cost (RTWD). An optional nitrogen charge can reduce the time and labor for projects expecting dis-assembly.
- Optional integrated forklift channels on the unit base allow for easy movement of the chiller at the job site.
- Single or dual point power connection options simplify overall installation.
- Unit-mounted starter eliminates additional job site installation considerations and labor requirements.
- Trane CH530 controls easily interface with Tracer Summit™, or LonTalk®, or BACnet® building automation systems through single twisted-pair wire.
- Trane has conducted extensive factory testing during manufacturing, and also offers options for in-person and/or documented system performance verification.

Precision Control

- Microprocessor-based Trane CH530 controls monitor and maintain optimal operation of the chiller and its associated sensors, actuators, relays, and switches, all of which are factory-assembled and extensively tested.
- Easy interface with computers hosting LonTalk®/Tracer Summit/BACnet building automation/energy management systems allows the operator to efficiently optimize comfort system performance and minimize operating costs.
- Proportional Integral Derivative (PID) control strategy ensures stable, efficient chilled water temperature, maintaining $\pm 1^{\circ}\text{F}$ (0.56°C) by reacting to instantaneous load changes.
- Adaptive Control™ attempts to maintain chiller operation under adverse conditions, when many other chillers might simply shut down. This is accomplished by unloading the compressor due to high condensing pressure, low suction pressure and/or overcurrent.
- EMC certification ensures trouble-free use of electronic devices around the chiller.
- Easy-to-use operator interface displays all operating and safety messages, with complete diagnostics information, on a easily readable panel with a scrolling touch-screen display.
- New variable evaporator flow compensation maintains improved control stability of the leaving water temperature.





Application Considerations

Condenser Water Temperatures

With the model RTWD chiller, condenser head pressure control is necessary only if the unit starts with leaving condenser water temperatures below 45°F (7.2°C) or cannot rise to 55°F (12.8°C) within 10 minutes.

When the application requires startup temperatures below the prescribed minimums, a variety of system implementation options are available. Here are two recommended methods to control the unit operating conditions for the purpose of refrigerant differential pressure control.

1. Condenser Entering Water Temperature Control
 - Tower bypass may also be a valid control method if the chiller temperature requirements can be maintained and the loop is small.
2. Condenser Water Flow Control
 - To control a 2-way or 3-way valve, select the Condenser Regulating Valve Control option for the Trane CH530 controls. This option enables the CH530 controls to send a signal for opening and closing the valve as necessary to maintain chiller differential refrigerant pressure. The 2-way valves are available as a ship-with option.

The minimum acceptable refrigerant pressure differential between condenser and evaporator is 25 psid (172.4 kPa) at all load conditions in order to ensure adequate oil circulation. The condenser and evaporator pressure differential must be 15 psid (103.4 kPa) within 2 minutes of start up. This equates to the condenser leaving water temperature being 17°F (9.5°C) higher than evaporator leaving water temperature within 2 minutes of startup.

Trane Series R chillers start and operate successfully and reliably over a range of load conditions with controlled condenser pressure. Reducing the condenser water temperature is an effective method of lowering chiller power input required, but the ideal temperature for optimizing total system power consumption will depend on the overall system dynamics. From a system perspective, some improvements in chiller efficiency may be offset by the increased tower fan and pumping costs required to achieve the lower tower temperatures. Contact your local Trane systems solution provider for more information on optimizing system performance.

Variable Evaporator Flow and Short Evaporator Water Loops

Variable evaporator flow is an energy-saving design strategy which has quickly gained acceptance as advances in chiller and controls technology have made it possible. With its superior unloading compressor design and advanced Trane CH530 controls, the chiller has excellent capability to maintain leaving water temperature control within +/-0.5°F (0.28°C), even for systems with variable evaporator flow.

Some basic rules should be followed whenever using these system design and operational savings methods with the chiller. The proper location of the chilled water temperature control sensor is in the supply (outlet) water. This location allows the building to act as a buffer, and it assures a slowly changing return water temperature. If there is insufficient water volume in the system to provide an adequate buffer, temperature control can be lost, resulting in erratic system operation and excessive compressor cycling. To ensure consistent operation and tight temperature control, the chilled water loop should be at least two minutes. If this recommendation cannot be followed, and tight leaving water temperature control is necessary, a storage tank or larger header pipe should be installed to increase the volume of water in the system.

For variable primary flow applications, the rate of chilled water flow change should not exceed 10 percent of design per minute to maintain +/-0.5°F (0.28°C) leaving evaporator temperature control. For applications in which system energy savings is most important and tight temperature control is classified as +/-2°F (1.1°C), up to 30 percent change in flow per minute are possible. Flow rates should be maintained between the minimum and maximum allowed for any particular chiller configuration.

Application Considerations

For applications designed to operate with changes in the water flow rate, the new evaporator water-flow compensation improves the ability of the chiller to respond to increasing or decreasing water flow. This new standard control feature works by varying the leaving evaporator temperature control gains in response to changes in evaporator water flow. By measuring the refrigerant flow in each circuit and using this value to calculate the resulting waterside temperature drop, the CH530 can estimate the water flow rate through the evaporator.

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

Series Chiller Arrangements

Another energy-saving strategy is to design the system around chillers arranged in series, on the evaporator, condenser, or both. It is possible to operate a pair of chillers more efficiently in a series chiller arrangement than in a parallel arrangement. It is also possible to achieve higher entering-to-leaving chiller differentials, which may, in turn, provide the opportunity for lower chilled water design temperature, lower design flow, and resulting installation and operational cost savings (including downsizing a chiller).

The Trane screw compressor also has excellent “lift” capabilities which afford an opportunity for savings on the evaporator and condenser water loops. Like series arrangements on the evaporator, series arrangements on the condenser may enable savings. This approach may allow reductions in pump and tower installation and operating costs.

Maximizing system efficiency requires that the designer balance performance considerations for all system components; the best approach may or may not involve multiple chillers, or series arrangement of the evaporators and/or condensers. This ideal balance of design integrity with installation and operating cost considerations should be researched by consulting a Trane systems solutions provider and applying the Trace™ building energy and economic analysis program.

Water-to-Water Heat Pump

The RTWD can be used as a water side heat pump by using ground or surface water as a heat source. Leaving condenser water control option provides the ability to control the heating setpoint. Local regulation concerning limitation on minimum/maximum rejected water temperature needs to be checked before using this method.

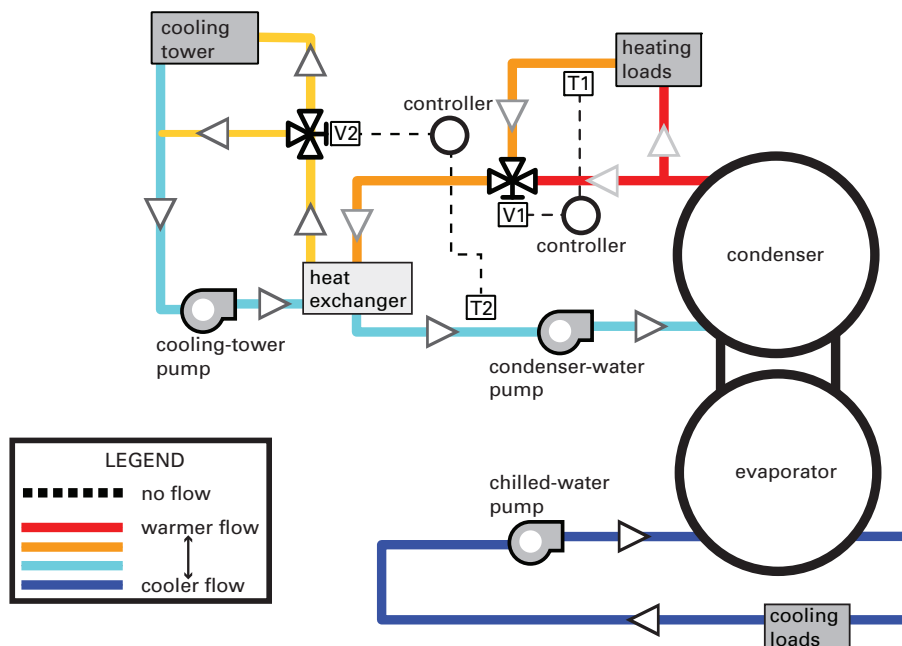
Dry Cooler

The RTWD can be used with dry coolers. Generally this application is selected to minimize the spread of airborne contaminants associated with open tower systems. In addition, other drawbacks of cooling towers are avoided: water consumption, production of vapor, need of water treatment, etc. Another benefit of dry coolers is the ability to operate in low ambient conditions. With the use of a third party heat exchanger this design can also be used to provide free cooling to the chilled water loop during cold weather.

Heat Recovery

At a time when energy costs are high and continue to rise, reducing energy usage has become increasingly important. By using a RTWD chiller with heat recovery, utilization of energy can be improved by using heat from the condenser that would otherwise be wasted.

The use of heat recovery should be considered in any building with simultaneous heating and cooling requirements or in facilities where heat can be stored and used at a later time. Buildings with high year-round internal cooling loads are excellent opportunities for heat recovery. Heat recovery can be accomplished with the RTWD by recovering heat from the water leaving the standard condenser and using it in conjunction with a third party heat exchanger.



Water Treatment

The use of untreated or improperly treated water in chillers may result in scaling, erosion, corrosion, and algae or slime buildup. It is recommended that the services of a qualified water treatment specialist be engaged to determine what treatment, if any, is advisable.

Water Pumps

Where noise limitation and vibration-free operation are important, Trane strongly encourages the use of 1450-rpm (50 Hz) pumps. Specifying or using 3000-rpm (50 Hz) condenser water and chilled water pumps must be avoided, because such pumps may operate with objectionable levels of noise and vibration. In addition, a low frequency beat may occur due to the slight difference in operating rpm between 3000-rpm (50 Hz) water pumps and Series R chiller motors.

Note: The chilled water pump must not be used to stop the chiller.

Acoustic Considerations

For chiller sound ratings, installation tips, and considerations on chiller location, pipe isolation, etc., refer to the *Water-Cooled Series R Chillers Sound Ratings and Installation Guide*.



Model Number Descriptions

Digits 1-4 — Chiller Model

RTWD= Water-Cooled Series R® Chiller

Digits 5-7 — Unit Nominal Tonnage

060 = 60 Nominal Tons
070 = 70 Nominal Tons
080 = 80 Nominal Tons
090 = 90 Nominal Tons
100 = 100 Nominal Tons
110 = 110 Nominal Tons
120 = 120 Nominal Tons
130 = 130 Nominal Tons
140 = 140 Nominal Tons
150 = 150 Nominal Tons
160 = 160 Nominal Tons
180 = 180 Nominal Ton
200 = 200 Nominal Tons
220 = 220 Nominal Tons
250 = 250 Nominal Tons

Digit 8 — Unit Voltage

E = 400/50/3

Digit 9 — Manufacturing Plant

2 = Pueblo, USA

Digits 10, 11 — Design Sequence

** = Factory Assigned

Digit 12 — Unit Type

1 = Standard Efficiency/Performance
2 = High Efficiency/Performance
3 = Premium Efficiency/Performance

Digit 13 — Agency Listing

0 = No Agency Listing
A = UL Listed to US and Canadian Safety Standards
D = IBC Seismically Rated Unit
E = UL/Canadian and IBC
F = OSHPD Seismically Rated Unit
G = UL/Canadian and OSHPD

Digit 14 — Pressure Vessel Code

1 = ASME Pressure Vessel Code
3 = Chinese Code Pressure Vessel
S = Special

Digit 15 — Unit Application

A = Std Condenser <=95°F/35°C Entering Water Temperature
B = High Temperature Condenser >95°F/35°C Entering Water Temp
C = Water-to-Water Heat Pump
D = Remote Condenser by Trane
E = Remote Condenser by Others

Digit 16 — Pressure Relief Valve

1 = Single Relief Valve
2 = Dual Relief Valve with 3-Way Isolation Valve

Digit 17 — Water Connection Type

A = Grooved Pipe - Standard

Digit 18 — Evaporator Tubes

A = Internal and External Enhanced Evap Tube

Digit 19 — Evaporator Passes

2 = 2-Pass Evaporator
3 = 3-Pass Evaporator

Digit 20 — Evaporator Water Side Pressure

A = 150 psi/10.5 bar Evaporator Water Pressure

Digit 21 — Evaporator Application

1 = Standard Cooling
2 = Low Temperature
3 = Ice Making

Digit 22 — Condenser Tubes

A = Enhanced Fin - Copper
B = Internally Enhanced 90/10 CuNi Fin
X = Remote Condenser

Digit 23 — Condenser Water Side Pressure

0 = Remote Condenser
1 = 150 psi/10.5 Bar Condenser Water Pressure

Digit 24 — Compressor Starter Type

X = Across-the-Line Starter
Y = Wye-Delta Closed Transition Starter

Digit 25 — Incoming Power Line Connection

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

Digit 26 — Power Line Connection Type

A = Terminal Block
B = Mechanical Disconnect Switch
D = Circuit Breaker
E = High Fault Rated Panel with Circuit Breaker

Digit 27 — Under/Over Voltage Protection

0 = No Under/Over Voltage Protection
1 = Under/Over Voltage Protection

Digit 28 — Unit Operator Interface

A = DynaView™/English

Digit 29 — Remote Interface (Digital Comm)

0 = No Remote Digital Comm
1 = LonTalk®/Tracer™ Summit Interface
2 = Time of Day Scheduling
4 = BACnet® Interface

Digit 30 — External Water and Current Limit Setpoint

0 = No External Water and Current Limit Setpoint
A = External Water and Current Limit Setpoint 4-20 mA
B = External Water and Current Limit Setpoint 2-10 Vdc

Digit 31 — Ice Making

0 = No Ice Making
A = Ice Making with Relay
B = Ice Making without Relay

Digit 32 — Programmable Relays

0 = No Programmable Relay
A = Programmable Relay

Digit 33 — Condenser Refrigerant Pressure Output

0 = No Condenser Refrigerant Output
1 = Condenser Water Control Output
3 = Differential Pressure Output

Digit 34 — Outdoor Air Temp Sensor

0 = No Outdoor Air Temp Sensor
A = Outdoor Air Temp Sensor - CWR Low Ambient

Digit 35 — Condenser Leaving Hot Water Temp Control

0 = No Condenser Leaving Hot Water Temp Control
1 = Condenser Leaving Hot Water Temp Control

Digit 36 — Power Meter

0 = No Power Meter
P = Power Meter

Digit 37 — Motor Current Analog Output (%RLA)

0 = No Motor Current Analog Output
1 = Motor Current Analog Output

Digit 38 — A/C Fan Control

0 = No Fan Controls (RTWD)
A = Fan Control By Others
B = Integral Fan Controls

Digit 39 — Low Ambient Fan Control

- 0 = No Low Ambient Fan Control (RTWD)
- 1 = Two Speed Fans
- 2 = Variable Speed Fan with Analog Interface
- 3 = Variable Speed Fan with PWM Interface

Digit 40 — Installation Accessories

- 0 = No Installation Accessories
- A = Elastomeric Isolators
- B = Flanged Water Connection Kit
- C = Isolators and Flanged Water Connection Kit

Digit 41 — Flow Switch

- 0 = No Flow Switch
- 1 = 150 psi NEMA 1: Flow Switch x 1
- 2 = 150 psi NEMA 1: Flow Switch x 2
- 3 = 150 psi NEMA 4: Flow Switch x 1
- 4 = 150 psi NEMA 4: Flow Switch x 2
- 7 = Factory Installed Proof of Flow (Evap/Cond)
- 8 = Factor Installed Proof of Flow (Evap)

Digit 42 — 2-Way Water Regulating Valve

- 0 = No 2-Way Water Regulating Valve
- A = 3" 150 psi/88.9 mm 10.5 bar 115V
- B = 3" 150 psi/88.9 mm 10.5 bar 220V
- C = 4" 150 psi/114.3 mm 10.5 bar 115V
- D = 4" 150 psi/114.3 mm 10.5 bar 220V

Digit 43 — Sound Reduction Package

- 0 = No Sound Reduction Package
- A = Sound Reduction - Factory Installed

Digit 44 — Insulation

- 0 = No Insulation
- 1 = Factory Insulation - All Cold Parts
- 2 = Insulation for High Humidity

Digit 45 — Factory Charge

- 0 = Full Factory Refrigerant Charge (R-134a)
- 1 = Nitrogen Charge
- 5 = Full Factory Refrigerant Charge (R-513A)

Digit 46 — Base Rail Forklifting

- 0 = No Base Rail Forklifting
- B = Base Rail Forklifting

Digit 47 — Label and Literature Language

- B = Spanish
- D = English
- E = French
- G = Chinese - Traditional

Digit 48 — Special

- 0 = None
- F = Ship to Final Finisher
- S = Special

Digits 49-55

- 0 = Not Used

Digit 56 — Shipping Package

- 0 = No Skid (Standard)
- 1 = Skid
- 2 = Shrink Wrap
- 3 = Skid + Shrink Wrap

Digit 59 — Performance Test

- 0 = No Performance Test
- C = 1-Point Test with Report
- D = 2-Point Test with Report
- E = 3-Point Test with Report
- F = 4-Point Test with Report
- G = Witness 1-Point Test with Report
- G = Witness 1-Point Test with Report Rapid Restart
- H = Witness 2-Point Test with Report
- J = Witness 3-Point Test with Report
- K = Witness 4-Point Test with Report
- K = Witness 4-Point Test with Report Rapid Restart

Digit 60 — Evaporator Fluid Type

- 0 = Water
- 1 = Calcium Chloride
- 2 = Ethylene Glycol
- 3 = Propylene Glycol
- 4 = Methanol

Digit 61 — Condenser Fluid Type

- 0 = Water
- A = Calcium Chloride
- B = Ethylene Glycol
- C = Propylene Glycol
- D = Methanol
- E = Air-Cooled Condenser



General Data

Table 1. General data – RTWD, 50 Hz, standard efficiency

Size		70	80	90	100	110	120	130	140	150	
Compressor											
	Size	Ckt1/Ckt2	K2/K2	K2/L1	L1/L1	L1/L2	L2/L2	L2/M1	M1/M1	M1/M2	M2/M2
Evaporator											
2 Pass Arrangement											
Water Conn. Size	NPS	4	4	4	4	4	5	5	5	5	
	(mm)	100	100	100	100	100	125	125	125	125	
Water Storage	(gal)	11.2	12.6	14.0	14.0	14.0	16.2	17.7	17.7	19.1	
	(L)	42.2	47.6	53.0	53.0	53.0	61.5	66.8	66.8	72.2	
Minimum Flow	(gpm)	77	89	101	101	101	110	122	122	133	
	(L/s)	4.9	5.6	6.3	6.3	6.3	6.9	7.6	7.6	8.4	
Maximum Flow	(gpm)	281	324	368	368	368	400	444	444	487	
	(L/s)	17.8	20.5	23.2	23.2	23.2	25.3	28.0	28.0	30.8	
3 Pass Arrangement											
Water Conn. Size	NPS	3	3	3	3	3	4	4	4	4	
	(mm)	80	80	80	80	80	100	100	100	100	
Water Storage	(gal)	11.2	12.6	14.0	14.0	14.0	16.2	17.7	17.7	19.1	
	(L)	42.2	47.6	53.0	53.0	53.0	61.5	66.8	66.8	72.2	
Minimum Flow	(gpm)	52	59	67	67	67	73	81	81	89	
	(L/s)	3.2	3.7	4.2	4.2	4.2	4.6	5.1	5.1	5.6	
Maximum Flow	(gpm)	187	216	244	244	244	266	295	295	324	
	(L/s)	11.8	13.6	15.5	15.5	15.5	16.8	18.6	18.6	20.5	
Condenser											
Water Conn. Size	NPS	5	5	5	5	5	5	5	5	5	
	(mm)	125	125	125	125	125	125	125	125	125	
Water Storage	(gal)	12.4	14.2	16.0	16.9	16.9	18.5	20.9	20.9	22.4	
	(L)	46.8	53.6	60.4	63.8	63.8	70.1	79.2	79.2	84.8	
Minimum Flow	(gpm)	83	99	115	124	124	135	156	156	170	
	(L/s)	5.2	6.2	7.3	7.8	7.8	8.5	9.8	9.8	10.7	
Maximum Flow	(gpm)	301	361	421	451	451	491	571	571	622	
	(L/s)	19.0	22.8	26.6	28.5	28.5	31.0	36.1	36.1	39.3	
General Unit											
Refrigerant Type		R-134a or R-513A									
# Refrig Circuits		2	2	2	2	2	2	2	2	2	
Refrigerant Charge	(lb)	114.6/ 114.6	112.4/ 112.4	110.2/ 110.2	110.2/112.4	112.4/112.4	130.1/130.1	127.9/127.9	127.9/132.3	130.1/ 130.1	
	(kg)	52/52	51/51	50/50	50/51	51/51	59/59	58/58	58/60	59/59	
Oil Type		OIL00048									
Oil Charge	(qt)	7.2/7.2	7.2/7.2	7.2/7.2	7.2/10.5	10.5/10.5	10.5/10.5	10.5/10.5	10.5/10.5	10.5/10.5	
	(L)	6.8/6.8	6.8/6.8	6.8/6.8	6.8/9.9	9.9/9.9	9.9/9.9	9.9/9.9	9.9/9.9	9.9/9.9	

1. Data containing information on two circuits is shown as circuit 1/circuit 2.
 2. Flow limits are for water only.

Table 2. General data – RTWD, 50 Hz, high efficiency

Size		60	70	80	90	100	110	120	
Compressor									
	Size	Ckt1/Ckt2	K1/K1	K2/K2	K2/L1	L1/L1	L1/L2	L2/L2	L2/M1
Evaporator									
2 Pass Arrangement									
	Water Conn. Size	NPS	4	4	4	5	5	5	5
		(mm)	100	100	100	125	125	125	125
	Water Storage	(gal)	9.8	10.6	11.9	15.3	15.3	16.4	17.3
		(L)	37.0	40.2	45.2	57.9	57.9	62.3	65.4
	Minimum Flow	(gpm)	72	80	92	112	112	123	130
		(L/s)	4.5	5.0	5.8	7.0	7.0	7.7	8.2
	Maximum Flow	(gpm)	263	291	336	408	408	448	476
		(L/s)	16.6	18.4	21.2	25.8	25.8	28.3	30.0
3 Pass Arrangement									
	Water Conn. Size	NPS	3	3	3	4	4	4	4
		(mm)	80	80	80	100	100	100	100
	Water Storage	(gal)	9.8	10.6	11.9	15.3	15.3	16.4	17.3
		(L)	37.0	40.2	45.2	57.9	57.9	62.3	65.4
	Minimum Flow	(gpm)	48	53	61	75	75	82	87
		(L/s)	3.0	3.3	3.9	4.7	4.7	5.1	5.5
	Maximum Flow	(gpm)	175	193	223	271	271	298	316
		(L/s)	11.1	12.2	14.1	17.2	17.2	18.8	20.0
Condenser									
	Water Conn. Size	NPS	5	5	5	5	5	5	5
		(mm)	125	125	125	125	125	125	125
	Water Storage	(gal)	11.9	11.9	13.8	15.3	16.6	16.6	18.0
		(L)	45.1	45.1	52.2	58.1	62.7	62.7	68.3
	Minimum Flow	(gpm)	87	87	106	117	130	130	145
		(L/s)	5.5	5.5	6.7	7.4	8.1	8.1	9.1
	Maximum Flow	(gpm)	317	317	387	427	473	473	528
		(L/s)	20.0	20.0	24.5	27.0	29.9	29.9	33.3
General Unit									
	Refrigerant Type		R-134a or R-513A						
	# Refrig Circuits		2	2	2	2	2	2	2
	Refrigerant Charge	(lb)	99.2/99.2	99.2/99.2	97/97	121.3/121.3	121.3/123.5	121.3/121.3	119/119
		(kg)	45/45	45/45	44/44	55/55	55/56	55/55	54/54
	Oil Type		OIL00048						
	Oil Charge	(qt)	7.2/7.2	7.2/7.2	7.2/7.2	7.2/7.2	7.2/10.5	10.5/10.5	10.5/10.5
		(L)	6.8/6.8	6.8/6.8	6.8/6.8	6.8/6.8	6.8/9.9	9.9/9.9	9.9/9.9

1. Data containing information on two circuits is shown as circuit 1/circuit 2.
 2. Flow limits are for water only.



General Data

Table 3. General data – RTWD, 50 Hz, high efficiency (continued)

Size		130	140	160	180	200	220	250	
Compressor									
	Size	Ckt1/Ckt2	M1/M1	M1/M2	M2/M2	M2/N1	N1/N1	N1/N2	N2/N2
Evaporator									
2 Pass Arrangement									
	Water Conn. Size	NPS	5	5	5	5	6	6	6
		(mm)	125	125	125	125	150	150	150
	Water Storage	(gal)	19.2	20.3	22.3	24.2	28.6	29.9	31.8
		(L)	72.6	77.0	84.5	91.5	108.3	113.3	120.3
	Minimum Flow	(gpm)	141	152	170	187	211	224	240
		(L/s)	8.9	9.5	10.7	11.8	13.3	14.1	15.1
	Maximum Flow	(gpm)	515	554	621	683	773	817	879
		(L/s)	32.5	35.0	39.2	43.1	48.8	51.6	55.5
3 Pass Arrangement									
	Water Conn. Size	NPS	4	4	4	4	4	4	4
		(mm)	100	100	100	100	100	100	100
	Water Storage	(gal)	18.8	20.0	22.0	23.8	27.9	29.2	31.0
		(L)	71.2	75.6	83.2	90.1	105.5	110.5	117.5
	Minimum Flow	(gpm)	94	101	114	125	141	149	160
		(L/s)	5.9	6.4	7.1	7.8	8.9	9.4	10.1
	Maximum Flow	(gpm)	344	370	415	456	515	545	586
		(L/s)	21.7	23.3	26.2	28.7	32.5	34.4	37.0
Condenser									
	Water Conn. Size	NPS	6	6	6	6	6	6	6
		(mm)	150	150	150	150	150	150	150
	Water Storage	(gal)	21.6	22.9	24.6	26.2	31.1	31.1	35.2
		(L)	81.7	86.8	93.0	99.2	117.8	117.8	133.3
	Minimum Flow	(gpm)	160	173	190	206	245	245	286
		(L/s)	10.0	10.9	12.0	13.0	15.4	15.4	18.0
	Maximum Flow	(gpm)	583	634	694	755	895	895	1046
		(L/s)	36.8	40.0	43.8	47.6	56.5	56.5	66.1
General Unit									
	Refrigerant Type		R-134a or R-513A						
	# Refrig Circuits		2	2	2	2	2	2	
	Refrigerant Charge	(lb)	134.5/134.5	132.3/136.7	134.5/134.5	132.3/136.7	178.6/178.6	176.4/183.0	180.8/180.8
		(kg)	61/61	60/62	61/61	60/62	81/81	80/83	82/82
	Oil Type		OIL00048						
	Oil Charge	(qt)	10.5/10.5	10.5/10.5	10.5/10.5	10.5/12.4	12.4/12.4	12.4/12.4	12.4/12.4
		(L)	9.9/9.9	9.9/9.9	9.9/9.9	9.9/11.7	11.7/11.7	11.7/11.7	11.7/11.7

1. Data containing information on two circuits is shown as circuit 1/circuit 2.
 2. Flow limits are for water only.

Table 4. General data – RTWD, 50 Hz, premium efficiency

Size		160	180	200	
Compressor					
	Size	Ckt1/Ckt2	M2/M2	M2/N1	N1/N1
Evaporator					
2 Pass Arrangement					
	Water Conn. Size	NPS	6	6	6
		(mm)	150	150	150
	Water Storage	(gal)	29.3	31.3	31.8
		(L)	110.9	118.3	120.3
	Minimum Flow	(gpm)	187	202	240
		(L/s)	11.8	12.7	15.1
	Maximum Flow	(gpm)	683	739	879
		(L/s)	43.1	46.7	55.5
3 Pass Arrangement					
	Water Conn. Size	NPS	4	4	4
		(mm)	100	100	100
	Water Storage	(gal)	28.6	30.6	31.0
		(L)	108.3	115.7	117.5
	Minimum Flow	(gpm)	125	135	160
		(L/s)	7.8	8.5	10.1
	Maximum Flow	(gpm)	455	492	586
		(L/s)	28.7	31.1	37.0
Condenser					
	Water Conn. Size	NPS	6	6	6
		(mm)	150	150	150
	Water Storage	(gal)	30.0	34.5	39.2
		(L)	113.4	130.6	148.3
	Minimum Flow	(gpm)	206	245	326
		(L/s)	13.0	15.4	20.5
	Maximum Flow	(gpm)	754	895	1192
		(L/s)	47.6	56.5	75.3
General Unit					
	Refrigerant Type		R-134a		
	# Refrig Circuits		2	2	2
	Refrigerant Charge	(lb)	176.4/176.4	174.2/178.6	176.4/174.2
		(kg)	80/80	79/81	80/79
	Oil Type		OIL00048		
	Oil Charge	(qt)	10.5/10.5	10.5/12.4	12.4/12.4
		(L)	9.9/9.9	9.9/11.7	11.7/11.7

1. Data containing information on two circuits is shown as circuit 1/circuit 2.
 2. Flow limits are for water only.



Controls

LCD Touch-Screen Display with Multi-Language Support

The standard DynaView™ display provided with the Trane CH530 control panel features an LCD touch-screen, allowing access to all operational inputs and outputs. This display supports many languages including: English, Chinese, Dutch, French, German, Italian, Japanese, Korean, Portuguese, Spanish, and Thai.

Display Features Include:

- LCD touch-screen with LED backlighting, for scrolling access to input and output operating information
- Single-screen, folder/tab-style display of all available information on individual components (evaporator, condenser, compressor, etc.)
- Manual override indication
- Password entry/lockout system to enable or disable display
- Automatic and immediate stop capabilities for standard or immediate manual shutdown
- Fast, easy access to available chiller data in tabbed format, including:
 - Modes of operation, including normal cooling, ice making and hot water control
 - Water temperatures and setpoints, outdoor air temperature
 - Loading and limiting status and setpoints
 - Average line current
 - Start/stop differential timers
 - Auto/Manual mode for EXV, slide valve, and head pressure control
 - Pump status and override
 - Chilled water reset settings
 - Optional external setpoints, including:
 - Chilled water, current-limit, condenser leaving hot water temperature setpoint
 - Ice building
- Reports, listed on a single tabbed screen for easy access, including:
 - ASHRAE, containing all guideline 3 report information
 - Evaporator, condenser, compressor
- Evaporator, condenser, and compressor reports containing all operational information on individual components, including:
 - Water temperatures
 - Refrigerant pressures, temperatures, and approach
 - Oil pressure, head pressure control command
 - Flow switch status, EXV position
 - Compressor starts and run-time
 - Line phase percent RLA, amps, and volts
- Alarm and diagnostic information, including:
 - Flashing alarms with touch-screen button of alarm condition
 - Scrollable list of last ten active diagnostics
 - Specific information on applicable diagnostic from list of over one-hundred
 - Automatic or manual resetting diagnostic types

LonTalk®/Tracer Summit Interface

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

Required features:

- LonTalk®/Tracer Summit Interface

Additional options that may be used:

- Ice making, chilled water temperature reset - outdoor air

External devices required:

- Trane Tracer system or LonTalk® compatible system level interface.

Easy Operation and Maintenance

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

When integrated with a Tracer Summit building management system the total building operation can be optimized. With this system option, the full breadth of Trane's HVAC and controls experience are applied to offer solutions to many facility issues.

LonTalk® Chiller Controls

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

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

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

Tracer Summit

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

Energy Efficiency

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

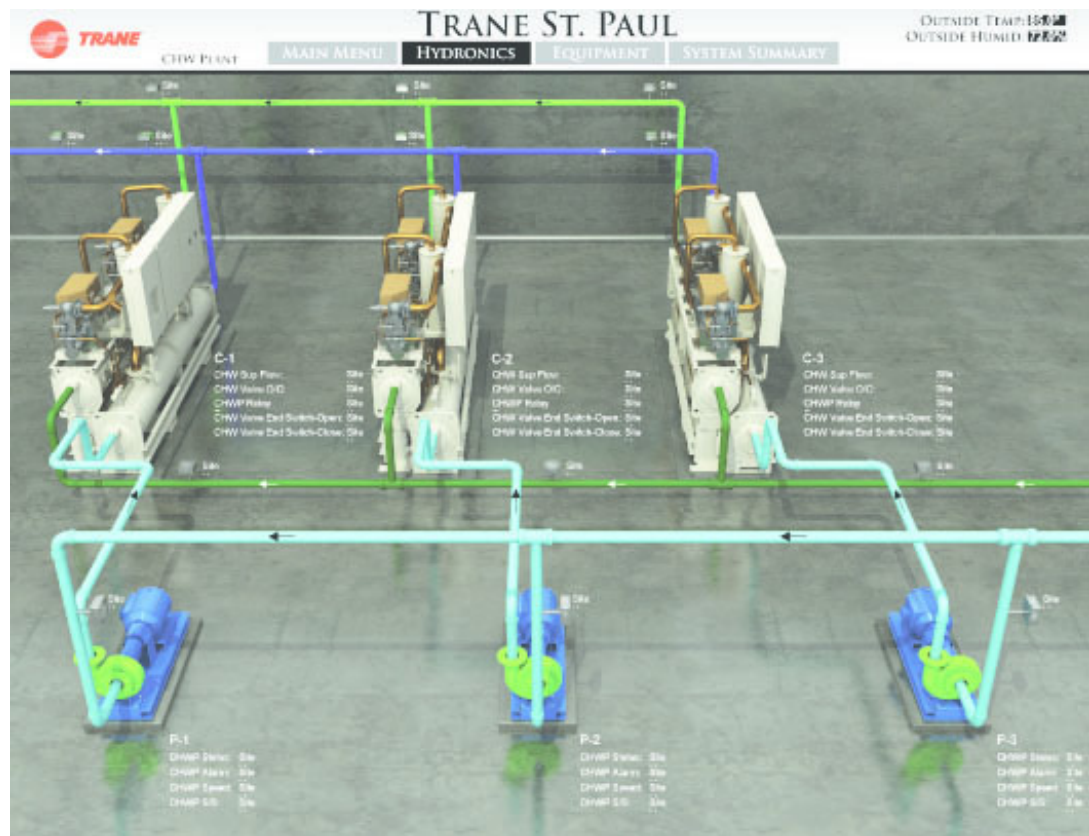
Regulatory Compliance Documentation

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

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).



BACnet Communication Interface

BACnet® communications capabilities are available, with communication link via single twisted-pair wiring.

Required features:

- BACnet Interface

Additional options that may be used:

- Ice making, chilled water temperature reset - outdoor air

External devices required:

- BACnet MS/TP network.

BACnet Chiller Controls

BACnet is an open standard communications protocol used by building automation systems. BACnet MS/TP uses RS-485 hardware. This device is a non-programmable communication module that connects directly to the CH530 chiller control.

Time of Day Scheduling

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

This feature allows the user to set 10 events in a 7 day time period. For each event the user can specify an activation time and the days of the week the event is active. Any setpoints available can be specified for each event, such as the leaving chilled water temperature (standard) and the current-limit setpoint (optional if ordered).

Required features:

- Time of day scheduling

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

- External chilled water setpoint
- External current-limit setpoint
- Condenser leaving hot water temperature setpoint
- Ice making initiation

Hardwire Points

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

Selectable options:

- External chilled water setpoint/External current-limit setpoint
- Ice making control
- Condenser leaving hot water temperature control
- Chilled water temperature reset
- Condenser pressure output
- Motor current analog output
- Programmable relays available outputs are: alarm-latching, alarm-auto reset, general alarm, warning, chiller limit mode, compressor running, head pressure relief request, and Tracer control



Electrical Data

Electrical Data Tables

Table 5. Electrical data - RTWD - 50 Hz - standard efficiency - standard condensing temperature

Unit Size	Rated Voltage	Unit Wiring				Motor Data		
		Single Point Power - 1 Power Connection		Dual Point Power - 2 Power Connections				
		MCA	MOP	MCA	MOP	RLA	LRA YD	LRA XL
70	400/50/3	106	150	60/58	100/100	46/46	129/129	427/427
80	400/50/3	123	175	60/75	100/125	46/60	129/144	427/462
90	400/50/3	137	175	77/75	125/125	60/60	144/144	462/462
100	400/50/3	152	200	77/90	125/150	60/72	144/180	462/589
110	400/50/3	164	225	92/90	150/150	72/72	180/180	589/589
120	400/50/3	180	250	92/106	150/175	72/85	180/217	589/668
130	400/50/3	193	250	108/106	175/175	85/85	217/217	668/668
140	400/50/3	211	300	108/124	175/200	85/99	217/259	668/796
150	400/50/3	225	300	126/124	200/200	99/99	259/259	796/796

Notes:

1. Voltage Utilization Range: +/- 10% of rated voltage. Rated voltage (use range): 400/50/3 (360-440)
2. MOP—maximum overcurrent protection
3. RLA—rated load amps are rated in accordance with UL Standard 1995.
4. LRA—locked rotor amps are based on full winding starts.
5. LRA YD—Locked Rotor Amps in Wye configuration. LRA XL—Locked Rotor Amps in the Delta configuration.
6. Local codes may take precedence.
7. Data containing information on two circuits shown as follows: circuit 1/circuit 2.
8. Standard condensing temperature option refers to entering condenser water temperatures 95°F (35°C) or below.

Table 6. Electrical data - RTWD - 50 Hz - high efficiency - standard condensing temperature

Unit Size	Rated Voltage	Unit Wiring				Motor Data		
		Single Point Power - 1 Power Connection		Dual Point Power - 2 Power Connections				
		MCA	MOP	MCA	MOP	RLA	LRA YD	LRA XL
60	400/50/3	88	125	50/48	80/80	38/38	112/112	370/370
70	400/50/3	103	125	58/56	100/100	45/45	129/129	427/427
80	400/50/3	121	175	58/74	100/125	45/59	129/144	427/462
90	400/50/3	135	175	76/74	125/125	59/59	144/144	462/462
100	400/50/3	150	200	76/89	125/150	59/71	144/180	462/589
110	400/50/3	162	225	91/89	150/150	71/71	180/180	589/589
120	400/50/3	178	250	91/105	150/175	71/84	180/217	589/668
130	400/50/3	192	250	108/105	175/175	84/84	217/217	668/668
140	400/50/3	209	300	108/123	175/200	84/98	217/259	668/796
160	400/50/3	223	300	125/123	200/200	98/98	259/259	796/796
180	400/50/3	247	350	125/147	200/250	98/117	259/291	796/896
200	400/50/3	266	350	149/147	250/250	117/117	291/291	896/896
220	400/50/3	296	400	149/177	250/300	117/141	291/354	896/1089
250	400/50/3	320	450	179/177	300/300	141/141	354/354	1089/1089

Notes:

1. Voltage Utilization Range: +/- 10% of rated voltage. Rated voltage (use range): 400/50/3 (360-440)
2. MOP—maximum overcurrent protection
3. RLA—rated load amps are rated in accordance with UL Standard 1995.
4. LRA—locked rotor amps are based on full winding starts.
5. LRA YD—Locked Rotor Amps in Wye configuration. LRA XL—Locked Rotor Amps in the Delta configuration.
6. Local codes may take precedence.
7. Data containing information on two circuits shown as follows: circuit 1/circuit 2.
8. Standard condensing temperature option refers to entering condenser water temperatures 95°F (35°C) or below.

Table 7. Electrical data - RTWD - 50 Hz - premium efficiency - standard condensing temperature

Unit Size	Rated Voltage	Unit Wiring				Motor Data		
		Single Point Power - 1 Power Connection		Dual Point Power - 2 Power Connections				
		MCA	MOP	MCA	MOP	RLA	LRA YD	LRA XL
160	400/50/3	221	300	124/122	200/200	97/97	259/259	796/796
180	400/50/3	246	350	124/147	200/250	97/117	259/291	796/896
200	400/50/3	266	350	149/147	250/250	117/117	291/291	896/896

Notes:

1. MCA—minimum circuit ampacity
2. MOP—maximum overcurrent protection
3. RLA—rated load amps are rated in accordance with UL Standard 1995.
4. LRA—locked rotor amps are based on full winding starts.
5. LRA YD—Locked Rotor Amps in Wye configuration. LRA XL—Locked Rotor Amps in the Delta configuration.
6. Local codes may take precedence.
7. Data containing information on two circuits shown as follows: circuit 1/circuit 2.
8. Standard condensing temperature option refers to entering condenser water temperatures 95°F (35°C) and below.

Table 8. Electrical data - RTWD - 50 Hz - high efficiency - high condensing temperature

Unit Size	Rated Voltage	Unit Wiring				Motor Data		
		Single Point Power - 1 Power Connection		Dual Point Power - 2 Power Connections				
		MCA	MOP	MCA	MOP	RLA	LRA YD	LRA XL
60	400/50/3	110	150	62/60	110/100	48/48	112/112	370/370
70	400/50/3	133	175	75/73	125/125	58/58	129/129	427/427
80	400/50/3	153	225	75/93	125/150	58/74	129/144	427/462
90	400/50/3	169	225	95/93	150/150	74/74	144/144	462/462
100	400/50/3	186	250	95/110	150/175	74/88	144/180	462/589
110	400/50/3	200	250	112/110	200/175	88/88	180/180	589/589
120	400/50/3	215	300	112/125	200/225	88/100	180/217	589/668
130	400/50/3	226	300	128/123	225/200	100/98	217/217	668/668
150	400/50/3	250	350	128/148	225/250	100/118	217/259	668/796
160	400/50/3	268	350	150/148	250/250	118/118	259/259	796/796
180	400/50/3	297	400	150/177	250/300	118/141	259/291	796/896
200	400/50/3	320	450	179/177	300/300	141/141	291/291	896/896
220	400/50/3	352	500	179/209	300/350	141/167	291/354	896/1089
250	400/50/3	378	500	211/209	350/350	167/167	354/354	1089/1089

Notes:

1. Voltage Utilization Range: +/- 10% of rated voltage. Rated voltage (use range): 400/50/3 (360-440)
2. MCA—minimum circuit ampacity
3. MOP—maximum overcurrent protection
4. RLA—rated load amps are rated in accordance with UL Standard 1995.
5. LRA—locked rotor amps are based on full winding starts.
6. LRA YD—Locked Rotor Amps in Wye configuration. LRA XL—Locked Rotor Amps in the Delta configuration.
7. Local codes may take precedence.
8. Data containing information on two circuits shown as follows: circuit 1/circuit 2.
9. High condensing temperature option refers to entering condenser water temperatures above 95°F (35°C).



Electrical Data

Table 9. Electrical data - RTWD - 50 Hz - premium efficiency - high condensing temperature

Unit Size	Rated Voltage	Unit Wiring				Motor Data		
		Single Point Power - 1 Power Connection		Dual Point Power - 2 Power Connections				
		MCA	MOP	MCA	MOP	RLA	LRA YD	LRA XL
160	400/50/3	268	350	150/148	250/250	118/118	259/259	796/796
180	400/50/3	297	400	150/177	250/300	118/141	259/291	796/896
200	400/50/3	320	450	179/177	300/300	141/141	291/291	896/896

Notes:

1. Voltage Utilization Range: +/- 10% of rated voltage. Rated voltage (use range): 400/50/3 (360-440)
2. MCA—minimum circuit ampacity
3. MOP—maximum overcurrent protection
4. RLA—rated load amps are rated in accordance with UL Standard 1995.
5. LRA—locked rotor amps are based on full winding starts.
6. LRA YD—Locked Rotor Amps in Wye configuration. LRA XL—Locked Rotor Amps in the Delta configuration.
7. Local codes may take precedence.
8. Data containing information on two circuits shown as follows: circuit 1/circuit 2.
9. High condensing temperature option refers to entering condenser water temperatures above 95°F (35°C).

Customer Wire Selection

Table 10. Customer wire selection — RTWD, 50Hz, standard efficiency, standard condensing temperature

Unit Size	Volt	Single point power				Dual point power							
		Term Blk	Disc	Circuit Breaker		Terminal Block		Disconnect		Circuit Breaker		Ckt Brkr - Hi Fault	
				Std	Hi Fault	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Ckt 1	Ckt 2
70	400	14-2/0	3/0-350	4-4/0	4-4/0	14-2/0	14-2/0	3/0-350	3/0-350	10-1/0	10-1/0	8-3/0	8-3/0
80	400	14-2/0	3/0-350	4-4/0	4-4/0	14-2/0	14-2/0	3/0-350	3/0-350	10-1/0	8-3/0	8-3/0	8-3/0
90	400	14-2/0	3/0-350	4-4/0	4-4/0	14-2/0	14-2/0	3/0-350	3/0-350	8-3/0	8-3/0	8-3/0	8-3/0
100	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	8-3/0	4-4/0	8-3/0	4-4/0
110	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	4-4/0	4-4/0	4-4/0	4-4/0
120	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	4-4/0	4-4/0	4-4/0	4-4/0
130	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	4-4/0	4-4/0	4-4/0	4-4/0
140	400	4-500	1-250	(2) 1-250	(2) 2/0-500	14-2/0	14-2/0	3/0-350	3/0-350	4-4/0	3/0-350	4-4/0	3/0-350
150	400	4-500	1-250	(2) 1-250	(2) 2/0-500	14-2/0	14-2/0	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350

Notes:

1. Optional non-fused disconnect and circuit breaker.
2. Copper wire only, based on nameplate minimum circuit ampacity (MCA).
3. Standard condensing temperature option refers to entering condenser water temperatures 95°F (35°C) and below.

Table 11. Customer wire selection — RTWD, 50Hz, high efficiency, standard condensing temperature

Unit Size	Volt	Single point power				Dual point power							
		Term Blk	Disc	Circuit Breaker		Terminal Block		Disconnect		Circuit Breaker		Ckt Brkr - Hi Fault	
				Std	Hi Fault	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Ckt 1	Ckt 2
60	400	14-2/0	3/0-350	8-3/0	8-3/0	14-2/0	14-2/0	3/0-350	3/0-350	10-1/0	10-1/0	8-3/0	8-3/0
70	400	14-2/0	3/0-350	4-4/0	4-4/0	14-2/0	14-2/0	3/0-350	3/0-350	8-3/0	10-1/0	8-3/0	8-3/0
80	400	14-2/0	3/0-350	8-3/0	8-3/0	14-2/0	14-2/0	3/0-350	3/0-350	10-1/0	10-1/0	8-3/0	8-3/0
90	400	14-2/0	3/0-350	4-4/0	4-4/0	14-2/0	14-2/0	3/0-350	3/0-350	8-3/0	8-3/0	8-3/0	8-3/0
100	400	14-2/0	3/0-350	4-4/0	4-4/0	14-2/0	14-2/0	3/0-350	3/0-350	10-1/0	8-3/0	8-3/0	8-3/0
110	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	8-3/0	4-4/0	8-3/0	4-4/0
120	400	14-2/0	3/0-350	4-4/0	4-4/0	14-2/0	14-2/0	3/0-350	3/0-350	8-3/0	8-3/0	8-3/0	8-3/0
130	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	4-4/0	4-4/0	4-4/0	4-4/0
140	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	8-3/0	4-4/0	8-3/0	4-4/0
160	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	4-4/0	4-4/0	4-4/0	4-4/0
180	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	4-4/0	4-4/0	4-4/0	4-4/0
200	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	3/0-350	4-4/0	3/0-350	4-4/0
220	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	4-4/0	4-4/0	4-4/0	4-4/0
250	400	4-500	1-250	(2) 1-250	(2) 2/0-500	14-2/0	14-2/0	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350

Notes:

1. Optional non-fused disconnect and circuit breaker.
2. Copper wire only, based on nameplate minimum circuit ampacity (MCA).
3. Standard condensing temperature option refers to entering condenser water temperatures 95°F (35°C) and below.



Electrical Data

Table 12. Customer wire selection — RTWD, 50Hz, premium efficiency, standard condensing temperature

Unit Size	Volt	Single point power				Dual point power							
		Term Blk	Disc	Circuit Breaker		Terminal Block		Disconnect		Circuit Breaker		Ckt Brkr - Hi Fault	
				Std	Hi Fault	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Ckt 1	Ckt 2
160	400	4-500	1-250	(2) 1-250	(2) 2/0-500	14-2/0	14-2/0	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350
180	400	4-500	1-250	(2) 2/0-500	(2) 2/0-500	14-2/0	4-500	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350
200	400	4-500	1-250	(2) 2/0-500	(2) 2/0-500	4-500	4-500	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350

Notes:

1. Optional non-fused disconnect and circuit breaker.
2. Copper wire only, based on nameplate minimum circuit ampacity (MCA).
3. Standard condensing temperature option refers to entering condenser water temperatures 95°F (35°C) and below.

Table 13. Customer wire selection — RTWD, 50Hz, high efficiency, high condensing temperature

Unit Size	Volt	Single point power				Dual point power							
		Term Blk	Disc	Circuit Breaker		Terminal Block		Disconnect		Circuit Breaker		Ckt Brkr - Hi Fault	
				Std	Hi Fault	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Ckt 1	Ckt 2
60	400	14-2/0	3/0-350	4-4/0	4-4/0	14-2/0	14-2/0	3/0-350	3/0-350	8-3/0	10-1/0	8-3/0	8-3/0
70	400	14-2/0	3/0-350	4-4/0	4-4/0	14-2/0	14-2/0	3/0-350	3/0-350	8-3/0	8-3/0	8-3/0	8-3/0
80	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	8-3/0	4-4/0	8-3/0	4-4/0
90	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	4-4/0	4-4/0	4-4/0	4-4/0
100	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	4-4/0	4-4/0	4-4/0	4-4/0
110	400	4-500	3/0-350	3/0-350	3/0-350	14-2/0	14-2/0	3/0-350	3/0-350	3/0-350	4-4/0	3/0-350	4-4/0
120	400	4-500	1-250	(2) 1-250	(2) 2/0-500	14-2/0	14-2/0	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350
130	400	4-500	1-250	(2) 1-250	(2) 2/0-500	14-2/0	14-2/0	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350
140	400	4-500	1-250	(2) 2/0-500	(2) 2/0-500	14-2/0	4-500	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350
160	400	4-500	1-250	(2) 2/0-500	(2) 2/0-500	4-500	4-500	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350
180	400	4-500	1-250	(2) 2/0-500	(2) 2/0-500	4-500	4-500	3/0-350	1-250	3/0-350	(2) 1-250	3/0-350	(2) 2/0-500
200	400	4-500	(2) 2/0-500	(2) 2/0-500	(2) 2/0-500	4-500	4-500	1-250	1-250	(2) 1-250	(2) 1-250	(2) 2/0-500	(2) 2/0-500
220	400	(2) 4-500	(2) 2/0-500	(2) 2/0-500	(2) 2/0-500	4-500	4-500	1-250	1-250	(2) 1-250	(2) 2/0-500	(2) 2/0-500	(2) 2/0-500
250	400	(2) 4-500	(2) 2/0-500	(2) 2/0-500	(2) 2/0-500	4-500	4-500	1-250	1-250	(2) 2/0-500	(2) 2/0-500	(2) 2/0-500	(2) 2/0-500

Notes:

1. Optional non-fused disconnect and circuit breaker.
2. Copper wire only, based on nameplate minimum circuit ampacity (MCA).
3. High condensing temperature option refers to entering condenser water temperatures above 95°F (35°C).

Table 14. Customer wire selection — RTWD, 50Hz, premium efficiency, high condensing temperature

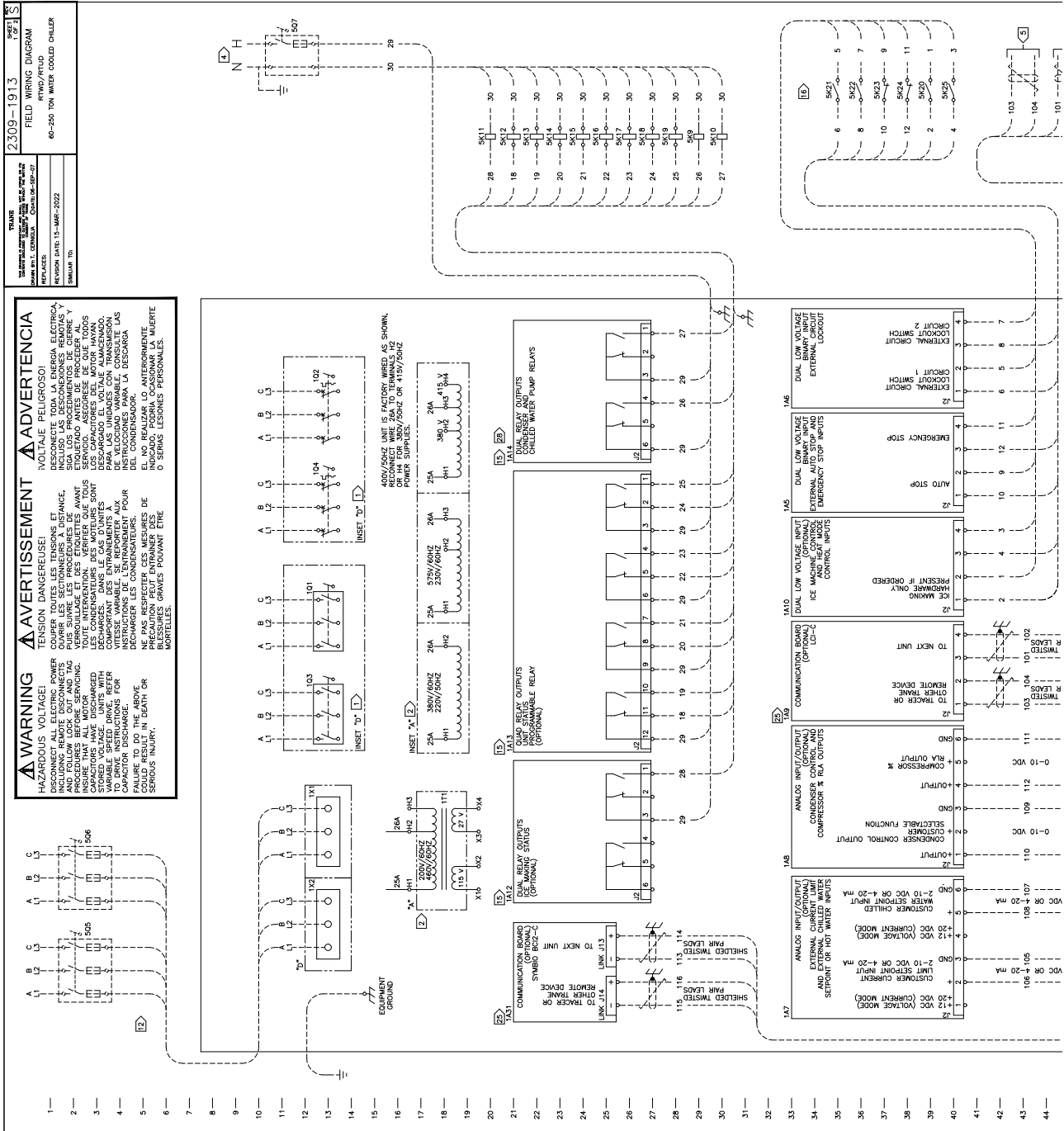
Unit Size	Volt	Single point power				Dual point power							
		Term Blk	Disc	Circuit Breaker		Terminal Block		Disconnect		Circuit Breaker		Ckt Brkr - Hi Fault	
				Std	Hi Fault	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Ckt 1	Ckt 2	Ckt 1	Ckt 2
160	400	4-500	1-250	(2) 2/0-500	(2) 2/0-500	4-500	4-500	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350	3/0-350
180	400	4-500	1-250	(2) 2/0-500	(2) 2/0-500	4-500	4-500	3/0-350	1-250	3/0-350	(2) 1-250	3/0-350	(2) 2/0-500
200	400	4-500	(2) 2/0-500	(2) 2/0-500	(2) 2/0-500	4-500	4-500	1-250	1-250	(2) 1-250	(2) 1-250	(2) 2/0-500	(2) 2/0-500

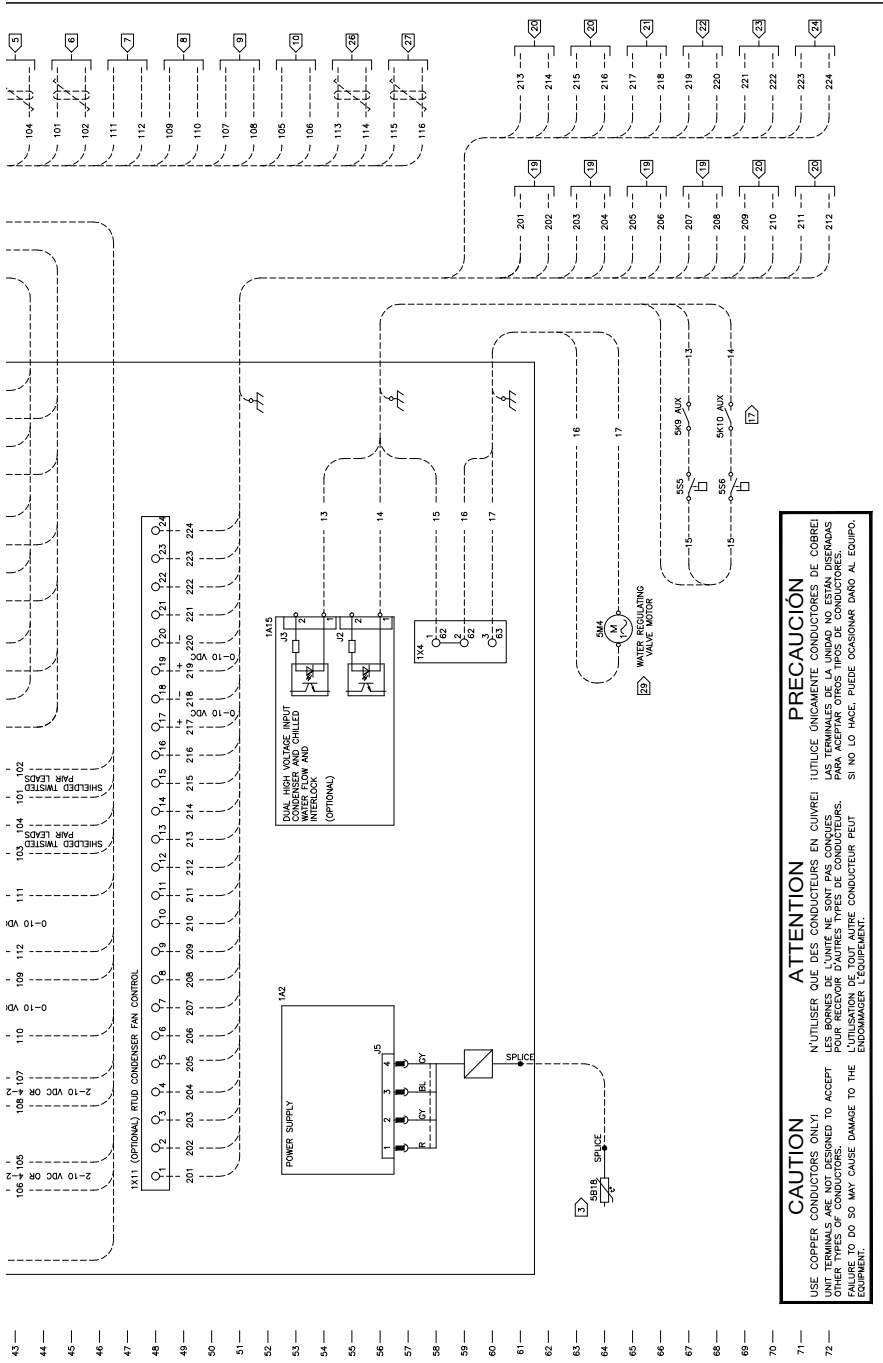
Notes:

1. Optional non-fused disconnect and circuit breaker.
2. Copper wire only, based on nameplate minimum circuit ampacity (MCA).
3. High condensing temperature option refers to entering condenser water temperatures above 95°F (35°C).

Electrical Connection

Figure 1. RTWD/RTUD field wiring diagram





CAUTION
 USE COPPER CONDUCTORS ONLY!
 UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT
 ALUMINUM CONDUCTORS. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE
 EQUIPMENT.

ATTENTION
 N'UTILISER QUE DES CONDUCTEURS EN CUIVRE!
 LES BORNES DE L'UNITÉ NE SONT PAS CONÇUES
 POUR ACCEPTER DES CONDUCTEURS EN ALUMINUM.
 L'UTILISATION DE TOUT AUTRE CONDUCTEUR PEUT
 ENDOMMAGER L'ÉQUIPEMENT.

PRECAUCIÓN
 UTILICE ÚNICAMENTE CONDUCTORES DE COBRE!
 LAS TERMINALES DE LA UNIDAD NO ESTÁN DISEÑADAS
 PARA ACEPTAR CONDUCTORES DE ALUMINIO.
 SI NO LO HACE, PUEDE CAUSAR DAÑO AL EQUIPO.

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Electrical Connection

Figure 2. RTWD/RTUD field wiring diagram — notes

<p>TRANS FOR PARTS SEE 2007 TO 2010 FIELD WIRING MANUAL, FIELD WIRING DRAWN BY: T. CERNIGLIA DATE: 11-NOV-07</p> <p>REPLACES: REVISION DATE: 15-MAR-2022</p> <p>SIMILAR TO:</p>	<p>2309-1913</p> <p>FIELD WIRING DIAGRAM RTWD/RTUD</p> <p>60-250 TON WATER COOLED CHILLER</p>	<p>REV SHEET 2 OF 2</p>																																																																																															
<p>REPLACEABLE FUSE TABLE</p>																																																																																																	
			<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Panel Type</th> <th>Volts Hertz</th> <th>Designation</th> <th>Class</th> <th>QTY.</th> <th>Size (A)</th> </tr> </thead> <tbody> <tr> <td rowspan="4">200</td> <td rowspan="4">60</td> <td>1F13, 14</td> <td>CC</td> <td>2</td> <td>10</td> </tr> <tr> <td>1F18, 19, 20, 21</td> <td>CC</td> <td>4</td> <td>3</td> </tr> <tr> <td>1F16, 17</td> <td>CC</td> <td>2</td> <td>6</td> </tr> <tr> <td>1F15</td> <td>CC</td> <td>1</td> <td>10</td> </tr> <tr> <td rowspan="3">230</td> <td rowspan="3">60</td> <td>1F13, 14</td> <td>CC</td> <td>2</td> <td>8</td> </tr> <tr> <td>1F18, 19, 20, 21</td> <td>CC</td> <td>4</td> <td>3</td> </tr> <tr> <td>1F16, 17</td> <td>CC</td> <td>2</td> <td>6</td> </tr> <tr> <td rowspan="3">380</td> <td rowspan="3">60</td> <td>1F15</td> <td>CC</td> <td>1</td> <td>10</td> </tr> <tr> <td>1F13, 14</td> <td>CC</td> <td>2</td> <td>5</td> </tr> <tr> <td>1F18, 19, 20, 21</td> <td>CC</td> <td>4</td> <td>3</td> </tr> <tr> <td rowspan="3">460</td> <td rowspan="3">60</td> <td>1F16, 17</td> <td>CC</td> <td>2</td> <td>6</td> </tr> <tr> <td>1F15</td> <td>CC</td> <td>1</td> <td>10</td> </tr> <tr> <td>1F13, 14</td> <td>CC</td> <td>2</td> <td>5</td> </tr> <tr> <td rowspan="3">575</td> <td rowspan="3">60</td> <td>1F18, 19, 20, 21</td> <td>CC</td> <td>4</td> <td>3</td> </tr> <tr> <td>1F16, 17</td> <td>CC</td> <td>2</td> <td>6</td> </tr> <tr> <td>1F15</td> <td>CC</td> <td>1</td> <td>10</td> </tr> <tr> <td rowspan="3">400</td> <td rowspan="3">50</td> <td>1F13, 14</td> <td>CC</td> <td>2</td> <td>5</td> </tr> <tr> <td>1F18, 19, 20, 21</td> <td>CC</td> <td>4</td> <td>3</td> </tr> <tr> <td>1F16, 17</td> <td>CC</td> <td>2</td> <td>6</td> </tr> </tbody> </table>	Panel Type	Volts Hertz	Designation	Class	QTY.	Size (A)	200	60	1F13, 14	CC	2	10	1F18, 19, 20, 21	CC	4	3	1F16, 17	CC	2	6	1F15	CC	1	10	230	60	1F13, 14	CC	2	8	1F18, 19, 20, 21	CC	4	3	1F16, 17	CC	2	6	380	60	1F15	CC	1	10	1F13, 14	CC	2	5	1F18, 19, 20, 21	CC	4	3	460	60	1F16, 17	CC	2	6	1F15	CC	1	10	1F13, 14	CC	2	5	575	60	1F18, 19, 20, 21	CC	4	3	1F16, 17	CC	2	6	1F15	CC	1	10	400	50	1F13, 14	CC	2	5	1F18, 19, 20, 21	CC	4	3	1F16, 17	CC	2	6
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		1F16, 17	CC	2	6																																																																																												
<p>1 SINGLE SOURCE POWER IS PROVIDED AS STANDARD ON THESE PRODUCTS. DUAL SOURCE POWER IS OPTIONAL. FIELD CONNECTIONS FOR SINGLE SOURCE POWER ARE MADE TO 1X1, 1Q1, OR 1Q2. WHEN THE OPTIONAL DUAL SOURCE POWER IS SELECTED THE FIELD CONNECTIONS FOR CIRCUIT #2 ARE MADE TO 1X2, 1Q3, OR 1Q4.</p> <p>2 FOR VOLTAGES 200V/60HZ, 220V/50HZ, 380V/60HZ, 460V/60HZ, WIRE 26A SHALL BE CONNECTED TO H2. FOR VOLTAGES 230V/60HZ & 575V/60HZ, WIRE 26A SHALL BE CONNECT TO H3. 400V/50HZ UNIT IS FACTORY WIRED WITH 26A CONNECTED TO H3 - RECONNECT WIRE 26A TO H2 FOR 380V/50HZ. OR H4 FOR 415V/50HZ. H4 IS ONLY AVAILABLE WITH 400V/50HZ PANELS.</p> <p>3 FACTORY INSTALLED OUTDOOR AIR TEMPERATURE SENSOR LEAD LENGTH TO BE SPLICED AND EXTENDED BY CUSTOMER. 18-AWG, TWISTED PAIR RECOMMENDED.</p> <p>4 CUSTOMER SUPPLIED POWER 115V/60HZ/1PH OR 220V/50HZ/1PH TO POWER RELAYS. MAX. FUSE SIZE IS 15 AMPS. GROUND ALL CUSTOMER SUPPLIED POWER SUPPLIES AS REQUIRED BY APPLICABLE CODES. GREEN GROUND SCREWS ARE PROVIDED IN UNIT CONTROL PANEL.</p> <p>5 WIRE TO NEXT UNIT. 22-AWG, SHIELDED COMMUNICATION WIRE EQUIVALENT TO HELIX LF22P0014216 RECOMMENDED. THE SUM TOTAL OF ALL INTERCONNECTED CABLE SEGMENTS NOT TO EXCEED 4500 FEET. CONNECTION TOPOLOGY SHOULD BE DAISY CHAIN. REFER TO BUILDING AUTOMATION SYSTEM (BAS) COMMUNICATION INSTALLATION LITERATURE FOR END OF LINE TERMINATION RESISTOR REQUIREMENTS.</p> <p>6 WIRE TO TRACER OR OTHER TRANE REMOTE DEVICE. 22-AWG, SHIELDED COMMUNICATION WIRE EQUIVALENT TO HELIX LF22P0014216 RECOMMENDED. THE SUM TOTAL OF ALL INTERCONNECTED CABLE SEGMENTS NOT TO EXCEED 4500 FEET. CONNECTION TOPOLOGY SHOULD BE DAISY CHAIN. REFER TO BUILDING AUTOMATION SYSTEM (BAS) COMMUNICATION INSTALLATION LITERATURE FOR END OF LINE TERMINATION RESISTOR REQUIREMENTS.</p> <p>7 WIRE TO COMPRESSOR % RLA.</p> <p>8 WIRE TO CONDENSER CONTROL CUSTOMER SELECTABLE FUNCTION.</p> <p>9 WIRE TO CUSTOMER CHILLED WATER SETPOINT 2-10 VDC OR 4-20 mA.</p> <p>10 WIRE TO CUSTOMER CURRENT LIMIT SETPOINT 2-10 VDC OR 4-20 mA.</p>	<p>11. REFER TO RTWD/RTUD ELECTRICAL SCHEMATIC FOR SPECIFIC ELECTRICAL CONNECTION INFORMATION AND NOTES PERTAINING TO WIRING INSTALLATION.</p> <p>12. ALL UNIT POWER WIRING MUST BE 600-V. COPPER CONDUCTORS ONLY AND HAVE A MINIMUM TEMPERATURE INSULATION RATING OF 75 DEGREE C. REFER TO UNIT NAMEPLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION DEVICE. PROVIDE AN EQUIPMENT GROUND IN ACCORDANCE WITH APPLICABLE ELECTRIC CODES.</p> <p>13. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH NATIONAL ELECTRIC CODE AND LOCAL REQUIREMENTS.</p> <p>14. ALL CUSTOMER CONTROL CIRCUIT WIRING MUST BE COPPER CONDUCTORS ONLY AND HAVE A MINIMUM INSULATION RATING OF 300 V. EXCEPT AS NOTED, ALL CUSTOMER CONTROL CIRCUIT WIRING CONNECTIONS HAVE A WIRE RANGE OF 14 TO 18 AWG.</p> <p>15. UNIT PROVIDED DRY CONTACTS FOR THE CONDENSER/CHILLED WATER PUMP CONTROL. RELAYS ARE RATED FOR 7.2 AMPS RESISTIVE, 2.88 AMPS PILOT DUTY, OR 3/4 HP, 7.2 FLA AT 120 V. CONTACTS ARE RATED FOR 5 A GENERAL PURPOSE DUTY 240 V.</p> <p>16. CUSTOMER SUPPLIED CONTACTS FOR ALL LOW VOLTAGE CONNECTIONS MUST BE COMPATIBLE WITH DRY CIRCUIT 24 VDC FOR A 12-mA RESISTIVE LOAD. SILVER OR GOLD PLATED CONTACTS RECOMMENDED.</p> <p>17. FLOW SWITCH AND INTERLOCK CONTACTS MUST BE ACCEPTABLE FOR USE IN A 120-V, 1-mA CIRCUIT OR A 220-V, 2-mA CIRCUIT.</p> <p>18. WIRES 201 AND 202 ENABLE FAN GROUP 1. WIRES 203 AND 204 ENABLE FAN GROUP 2. WIRES 205 AND 206 ENABLE FAN GROUP 3. WIRES 207 AND 208 ENABLE FAN GROUP 4.</p> <p>19. FAN GROUPS 1 AND 2 MAY BE COMBINED FOR TWO SPEED FAN CONTROL. WIRES 201 AND 202 ENABLE PART SPEED. WIRES 203 AND 204 ENABLE FULL SPEED. WIRES 205 AND 206 ENABLE PART SPEED. WIRES 207 AND 208 ENABLE FULL SPEED.</p>	<p>21. WIRES ARE CONNECTED TO 0-10-VDC SIGNAL AT 22 mA MAXIMUM FOR CIRCUIT 1, GROUP 1, CONDENSER FAN SPEED CONTROL.</p> <p>22. WIRES ARE CONNECTED TO 0-10-VDC SIGNAL AT 22 mA MAXIMUM FOR CIRCUIT 2, GROUP 1, CONDENSER FAN SPEED CONTROL.</p> <p>23. WIRES ARE CONNECTED TO CIRCUIT 1, GROUP 1, CONDENSER FAN FAULT FEEDBACK. CONNECTION MUST BE COMPATIBLE WITH DRY CIRCUIT 24 VDC FOR A 12-mA RESISTIVE LOAD. SILVER OR GOLD PLATED CONTACTS RECOMMENDED.</p> <p>24. WIRES ARE CONNECTED TO CIRCUIT 2, GROUP 1, CONDENSER FAN FAULT FEEDBACK. CONNECTION MUST BE COMPATIBLE WITH DRY CIRCUIT 24 VDC FOR A 12-mA RESISTIVE LOAD. SILVER OR GOLD PLATED CONTACTS RECOMMENDED.</p> <p>25. 1A31 (BAGNET) AND 1A9 (LONTALK) MAY NOT BE INSTALLED ON THE SAME UNIT.</p> <p>26. WIRE TO NEXT UNIT. 18-AWG, 24-pf/ft, SHIELDED COMMUNICATION WIRE RECOMMENDED. THE SUM TOTAL OF ALL INTERCONNECTED CABLE SEGMENTS NOT TO EXCEED 4000 FEET. CONNECTION TOPOLOGY SHOULD BE DAISY CHAIN. LIMIT LINK TO 60 TRANE DEVICES OR 32 DEVICES OF TRANE AND NON-TRANE MANUFACTURE.</p> <p>27. WIRE TO TRACER OR OTHER TRANE REMOTE DEVICE. 18-AWG, 24-pf/ft, SHIELDED COMMUNICATION WIRE RECOMMENDED. THE SUM TOTAL OF ALL INTERCONNECTED CABLE SEGMENTS NOT TO EXCEED 4000 FEET. CONNECTION TOPOLOGY SHOULD BE DAISY CHAIN. LIMIT LINK TO 60 TRANE DEVICES OR 32 DEVICES OF TRANE AND NON-TRANE MANUFACTURE.</p>																																																																																															

19 AMP'S PILOT DUTY, OR 1/3 HP. CONTACTS ARE RATED FOR 7.2 FLA AT 120 V OR 5 AMPS GENERAL PURPOSE DUTY AT 240 V.

20 WIRES 201 AND 202 ENABLE FAN GROUP 1. WIRES 203 AND 204 ENABLE FAN GROUP 2. WIRES 205 AND 206 ENABLE FAN GROUP 3. WIRES 207 AND 208 ENABLE FAN GROUP 4.

21 FAN GROUPS 1 AND 2 MAY BE COMBINED FOR TWO SPEED FAN CONTROL. WIRES 209 AND 210 ENABLE PART SPEED. WIRES 211 AND 212 ENABLE FULL SPEED. WHEN PROPERLY CONFIGURED, RTUD CONTROLS WILL NEVER ENABLE BOTH SIGNALS SIMULTANEOUSLY AND WILL PROVIDE A SHORT DELAY BETWEEN SIGNALS. TRANE RECOMMENDS THE USE OF MECHANICAL AND ELECTRONIC INTERLOCKS TO PREVENT EQUIPMENT DAMAGE IN THE EVENT OF CONTACT FAILURE OR MISCONFIGURATION.

22 WIRES ARE CONNECTED TO NORMALLY OPEN DRY CONTACTS FOR CIRCUIT 1 CONDENSER FAN CONTROL. RELAYS ARE RATED FOR 7.2 AMPS RESISTIVE, 2.88 AMP'S PILOT DUTY, OR 1/3 HP. CONTACTS ARE RATED FOR 7.2 FLA AT 120 V OR 5 AMPS GENERAL PURPOSE DUTY AT 240 V.

23 WIRES 209 AND 210 ENABLE FAN GROUP 1. WIRES 211 AND 212 ENABLE FAN GROUP 2. WIRES 213 AND 214 ENABLE FAN GROUP 3. WIRES 215 AND 216 ENABLE FAN GROUP 4.

24 FAN GROUPS 1 AND 2 MAY BE COMBINED FOR TWO SPEED FAN CONTROL. WIRES 209 AND 210 ENABLE PART SPEED. WIRES 211 AND 212 ENABLE FULL SPEED. WHEN PROPERLY CONFIGURED, RTUD CONTROLS WILL NEVER ENABLE BOTH SIGNALS SIMULTANEOUSLY AND WILL PROVIDE A SHORT DELAY BETWEEN SIGNALS. TRANE RECOMMENDS THE USE OF MECHANICAL AND ELECTRONIC INTERLOCKS TO PREVENT EQUIPMENT DAMAGE IN THE EVENT OF CONTACT FAILURE OR MISCONFIGURATION.

25 HAZARDOUS VOLTAGE! DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVE, REFER TO DRIVE INSTRUCTIONS FOR CAPACITOR DISCHARGE. FAILURE TO DO THE ABOVE COULD RESULT IN DEATH OR SERIOUS INJURY.

26 WIRE TO TRACER OR OTHER TRANE REMOTE DEVICE. 18-AWG, 24-pF/ft; SHIELDED COMMUNICATION WIRE RECOMMENDED. THE SUM TOTAL OF ALL INTERCONNECTED CABLE SEGMENTS NOT TO EXCEED 4000 FEET. CONNECTION TOPOLOGY SHOULD BE DAISY CHAIN. LIMIT LINK TO 60 TRANE DEVICES OR 32 DEVICES OF TRANE AND NON-TRANE MANUFACTURE.

27 ALL RTUD UNITS (SYSTEMS WITH A REMOTE CONDENSER) REQUIRE CHILLED WATER PUMPS BE CONTROLLED BY THE TRANE CH530 TO AVOID CATASTROPHIC DAMAGE TO THE EVAPORATOR DUE TO FREEZING. IT IS STRONGLY RECOMMENDED THAT CHILLED WATER PUMP CONTROL ALSO BE USED ON RTWD TO PROVIDE PROPER UNIT OPERATION.

28 220V VALVE OPTION REQUIRES CUSTOMER PROVIDED POWER.

29 IO EXCEED 4000 FEET. CONNECTION TOPOLOGY SHOULD BE DAISY CHAIN. LIMIT LINK TO 60 TRANE DEVICES OR 32 DEVICES OF TRANE AND NON-TRANE MANUFACTURE.

WARNING / **AVERTISSEMENT** / **ADVERTENCIA**

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NE PAS RESPECTER CES MESURES DE PRECAUTION PEUT ENTRAÎNER DES BLESSURES GRAVES POUVANT ETRE MORTELLES.

EL NO REALIZAR LO ANTERIORMENTE INDICADO, PODRIA OCASIONAR LA MUERTE O SERIAS LESIONES PERSONALES.

CAUTION

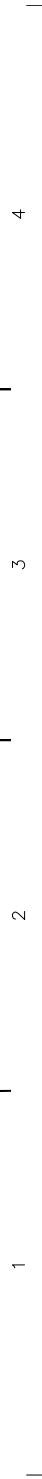
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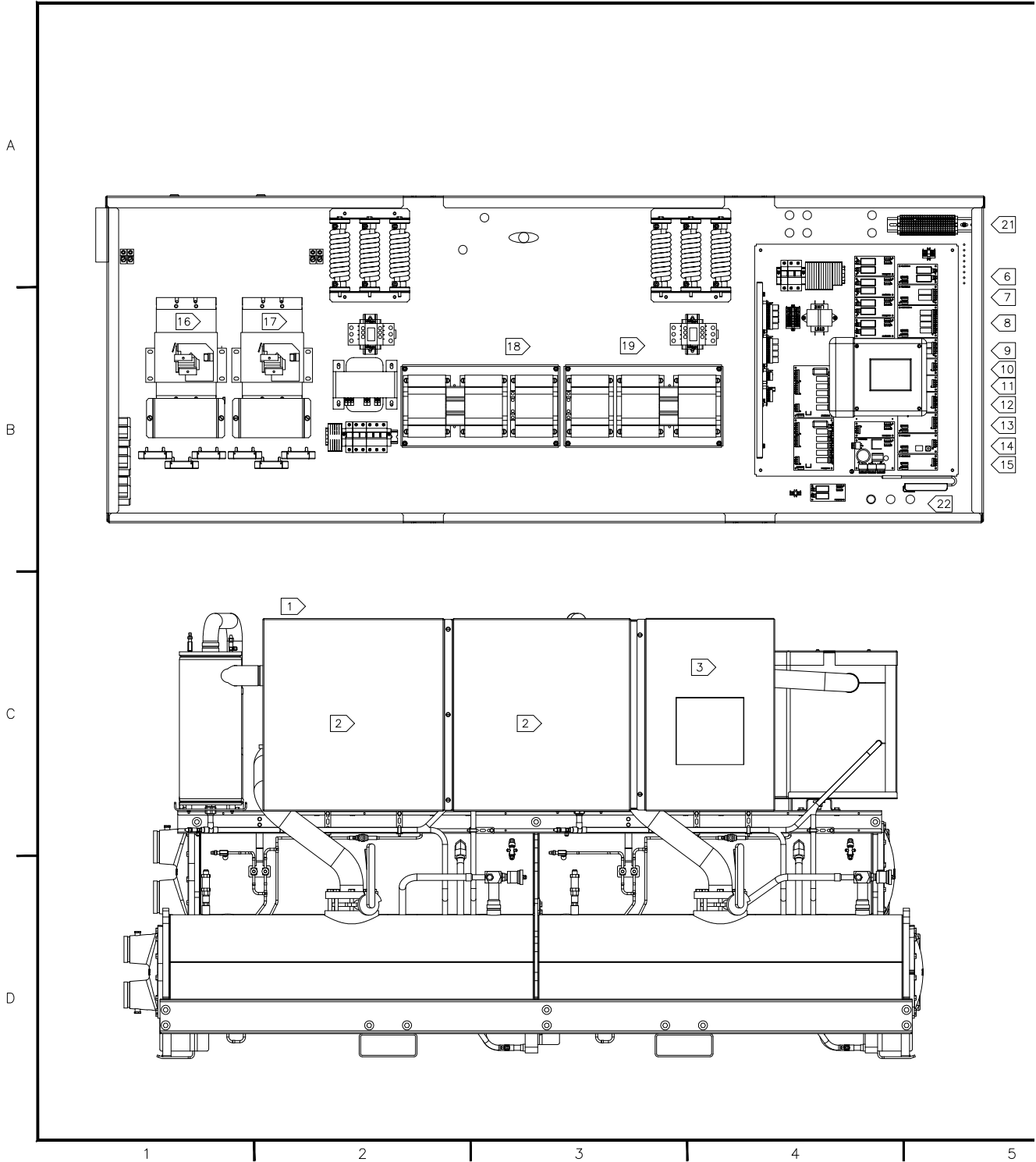
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Electrical Connection

Figure 3. Connection diagram



Electrical Connection

Figure 4. Connection diagram notes

	TRANE <small>THIS DRAWING IS AN INSTRUMENT AND SHALL NOT BE OPENED OR ITS CONTENTS DISRUPTED WITHOUT THE WRITTEN CONSENT OF TRANE</small> DRAWN BY: A. MANN © DATE: 10-SEP-07	2309-7598 CONNECTION DIAGRAM RTWD/RTUD 60-250 TON WATER COOLED CHILLER FIELD WIRING JOB SITE CONNECTIONS	SHEET 2 OF 2 REV D
A	<p>1 LINE VOLTAGE ENTRANCE (SEE UNIT NAMEPLATE)</p> <p>2 POWER SECTION</p> <p>3 CONTROLS SECTION</p> <p>4 CUSTOMER CONTROL POWER HIGH VOLTAGE ENTRANCE</p> <p>5 CUSTOMER CONTROL POWER LOW VOLTAGE ENTRANCE</p> <p>6 CONDENSER AND CHILLED WATER FLOW INPUTS (5K10 AND 5K9) (OPTIONAL)</p> <p>7 CONDENSER AND CHILLED WATER PUMP RELAY OUTPUTS. SEPARATE 115V/60HZ/1PH OR 220V/50HZ/1PH CUSTOMER POWER IS REQUIRED. (5K10 AND 5K9) (OPTIONAL)</p> <p>8 UNIT STATUS PROGRAMMABLE RELAY OUTPUTS. SEPARATE 115V/60HZ/1PH OR 220V/50HZ/1PH CUSTOMER POWER IS REQUIRED. (5K12 - 5K19) (OPTIONAL)</p> <p>9 ICE MAKING STATUS RELAY OUTPUT. SEPARATE 115V/60HZ/1PH OR 220V/50HZ/1PH CUSTOMER POWER IS REQUIRED. (5K11) (OPTIONAL)</p> <p>10 EXTERNAL AUTO STOP AND EMERGENCY STOP INPUTS (5K23 AND 5K24)</p> <p>11 EXTERNAL CIRCUIT LOCKOUT INPUTS CIRCUIT 1 AND CIRCUIT 2 (5K21 AND 5K22)</p> <p>12 EXTERNAL CURRENT LIMIT AND CHILLED WATER SETPOINT OR HOT WATER INPUTS (4-20 mA OR 2-10 VDC) (OPTIONAL)</p> <p>13 CONDENSER CONTROL AND COMPRESSOR % RLA INPUT (0-10 VDC) (OPTIONAL)</p> <p>14 TRACER COMMUNICATIONS (OPTIONAL)</p> <p>15 ICE MACHINE CONTROL AND HEAT MODE CONTROL (5K20 AND 5K25) (OPTIONAL)</p> <p>16 CIRCUIT 1 DISCONNECT (OPTIONAL)</p> <p>17 CIRCUIT 2 DISCONNECT (OPTIONAL)</p> <p>18 WYE DELTA CLOSED TRANSITION STARTER OR ACROSS LINE STARTER CIRCUIT 1A</p> <p>19 WYE DELTA CLOSED TRANSITION STARTER OR ACROSS LINE STARTER CIRCUIT 2A</p> <p>20. REFER TO RTWD/RTUD ELECTRICAL SCHEMATIC FOR SPECIFIC ELECTRICAL CONNECTION INFORMATION AND NOTES PERTAINING TO WIRING INSTALLATION.</p> <p>21 RTWD CONDENSER CONTROL (OPTIONAL)</p> <p>22 OUTDOOR AIR TEMPERATURE SENSOR (OPTIONAL)</p>		
B			
C			
D			
E			

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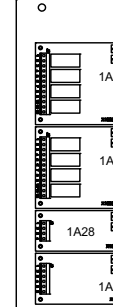
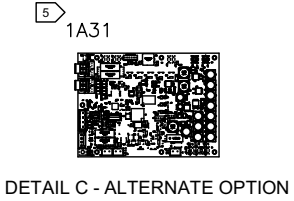
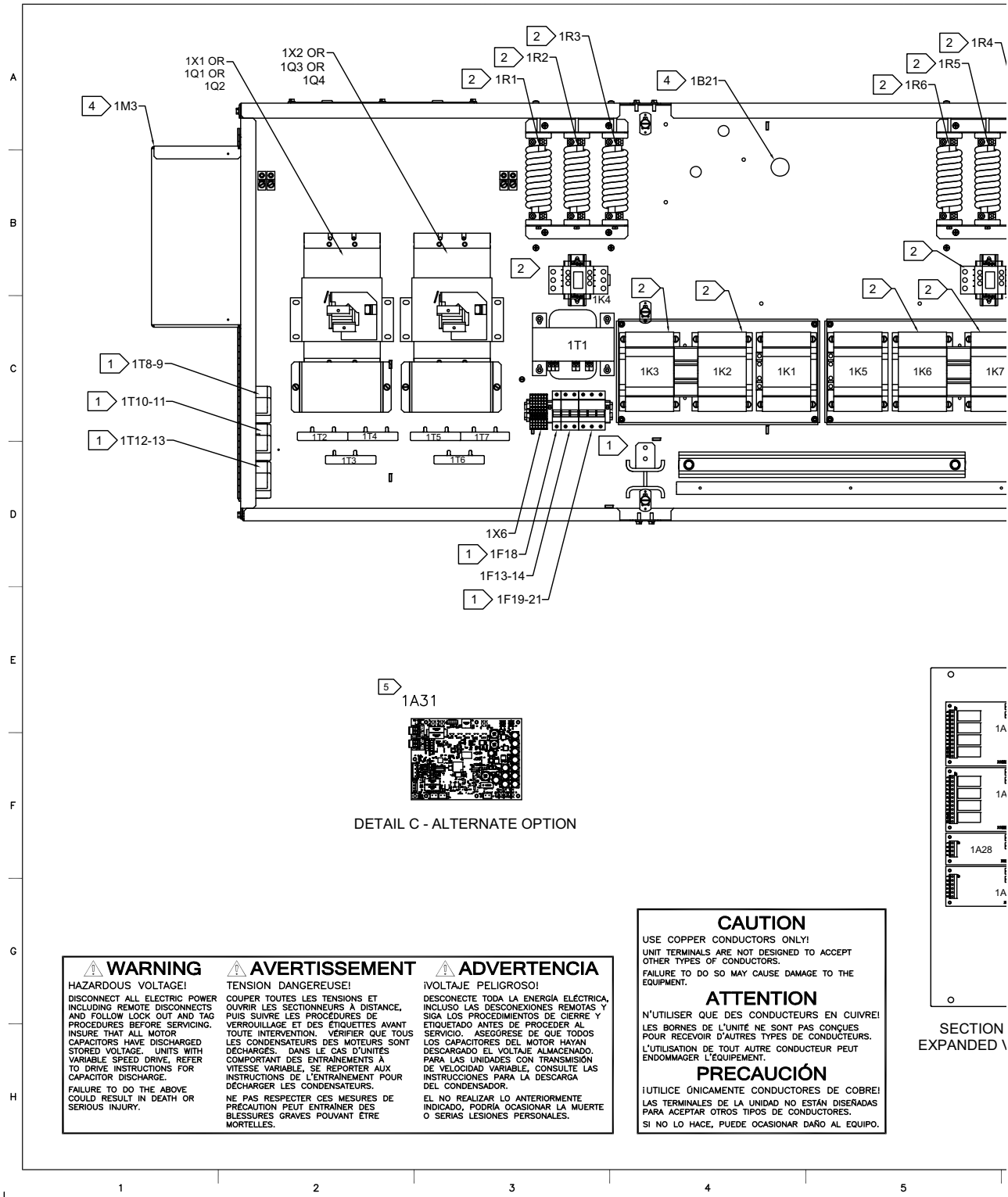
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1 2 3 4

Electrical Connection

Figure 5. RTWD/RTUD layout diagram

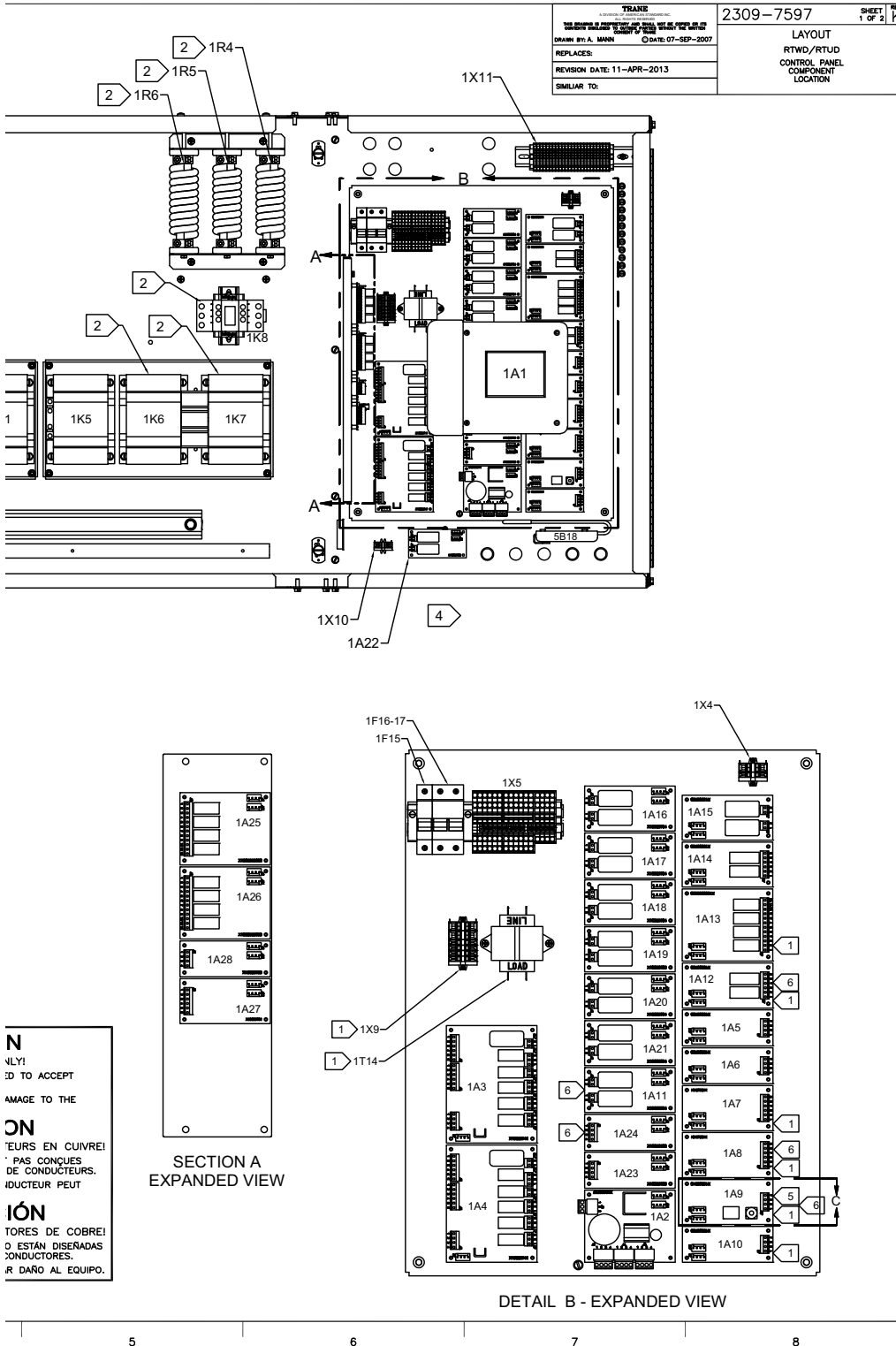


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Electrical Connection

Figure 6. RTWD/RTUD layout diagram notes

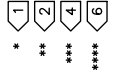
DEVICE DESIGNATION	DESCRIPTION	LEGEND
1A1	DYNA VIEW MAIN PROCESSOR INTERFACE	
1A2	POWER SUPPLY MODULE	
1A3	STARTER MODULE, COMPRESSOR 1A	
1A4	STARTER MODULE, COMPRESSOR 2A	
1A5	DUAL LOW VOLTAGE INPUT, EXTERNAL AUTO STOP AND EMERGENCY STOP INPUTS	
1A6	DUAL LOW VOLTAGE INPUT, EXTERNAL CIRCUIT LOCKOUT - REFRIGERANT CIRCUIT 1 AND 2	
1A7	ANALOG INPUT/OUTPUT, EXTERNAL CURRENT LIMIT AND EXTERNAL CHILLED WATER OR HOT WATER SETPOINT INPUTS	
1A8	ANALOG INPUT/OUTPUT, CONDENSER CONTROL AND COMPRESSOR % RLA OUTPUT	
1A9	CH4530 COMMS INTERFACE (L-C-C COMMUNICATIONS (ECHOLON))	
1A10	DUAL LOW VOLTAGE INPUT, ICE MACHINE CONTROL AND HEAT MODE CONTROL	
1A11	DUAL LOW VOLTAGE INPUT, MOTOR THERMOSTATS COMPRESSOR 2A AND 1A	
1A12	DUAL RELAY OUTPUT, ICE MAKING STATUS	
1A13	QUAD RELAY OUTPUTS, UNIT STATUS PROGRAMMABLE RELAYS	
1A14	DUAL RELAY OUTPUTS, CONDENSER AND CHILLED WATER PUMP RELAYS	
1A15	DUAL HIGH VOLTAGE INPUT, CONDENSER AND CHILLED WATER FLOW AND INTERLOCK	
1A16	DUAL TRIAC OUTPUT, MODULATING UNLOAD AND LOAD COMPRESSOR 2A	
1A17	DUAL TRIAC OUTPUT, STEP LOAD CONTROL COMPRESSOR 2A AND 1A	
1A18	DUAL TRIAC OUTPUT, MODULATING UNLOAD AND LOAD COMPRESSOR 1A	
1A19	DUAL HIGH VOLTAGE INPUT, HIGH PRESSURE CUTOFF COMPRESSOR 2A AND 1A	
1A20	DUAL TRIAC OUTPUT, OIL RETURN GAS PUMP DRAIN AND FILL, CIRCUIT 2	
1A21	DUAL TRIAC OUTPUT, OIL RETURN GAS PUMP DRAIN AND FILL, CIRCUIT 1	
1A22	DUAL HIGH VOLTAGE INPUT, PANEL VENTILATION	
1A23	DUAL LOW VOLTAGE INPUT, OIL LOSS LEVEL	
1A24	DUAL LOW VOLTAGE INPUT, WATER FLOW SENSOR	
1A25	QUAD RELAY OUTPUTS, CIRCUIT 1 FAN CONTROL	
1A26	QUAD RELAY OUTPUTS, CIRCUIT 2 FAN CONTROL	
1A27	ANALOG INPUT/OUTPUT, FAN SPEED CONTROL	
1A28	DUAL LOW VOLTAGE INPUT, FAULT FEEDBACK	
1A31	BACNET INTERFACE - BQI2-C	
1A32	DUAL HIGH VOLTAGE INPUT, HEAT WATER FLOW AND INTERLOCK	
1A33	DUAL RELAY OUTPUTS, HEAT WATER PUMP START	
1A34	DUAL LOW VOLTAGE INPUT, HEAT SUPPLEMENT AND HEAT RECOVERY INPUT	
1A39	MODBUS COMMUNICATIONS	
1A40	ANALOG INPUT/OUTPUT	
1B21	THERMOSTAT, PANEL VENTILATION	
1M3	MOTOR, VENTILATION FAN	
1F13	FUSE, POTENTIAL TRANSFORMER PRIMARY, COMPRESSOR 1A, LINE A, UNDER/OVER VOLTAGE - POWER METER	
1F14	FUSE, POTENTIAL TRANSFORMER PRIMARY, COMPRESSOR 1A, LINE B, UNDER/OVER VOLTAGE - POWER METER	
1F15	FUSE, CONTROL POWER TRANSFORMER SECONDARY, 115 V	
1F16	FUSE, CONTROL POWER TRANSFORMER SECONDARY, 27 V	
1F17	FUSE, CONTROL POWER TRANSFORMER SECONDARY, 27 V	
1F18	FUSE, POTENTIAL TRANSFORMER PRIMARY, COMPRESSOR 1A, LINE C, POWER METER	
1F19	FUSE, POTENTIAL TRANSFORMER PRIMARY, COMPRESSOR 2A, LINE A, POWER METER	
1F20	FUSE, POTENTIAL TRANSFORMER PRIMARY, COMPRESSOR 2A, LINE B, POWER METER	
1F21	FUSE, POTENTIAL TRANSFORMER PRIMARY, COMPRESSOR 2A, LINE C, POWER METER	
1K1	CONTACTOR, COMPRESSOR 1A, START	
1K2	CONTACTOR, COMPRESSOR 1A, RUN	
1K3	CONTACTOR, COMPRESSOR 1A, SHORT	
1K4	CONTACTOR, COMPRESSOR 1A, TRANSITION	
1K5	CONTACTOR, COMPRESSOR 2A, START	
1K6	CONTACTOR, COMPRESSOR 2A, RUN	
1K7	CONTACTOR, COMPRESSOR 2A, SHORT	
1K8	CONTACTOR, COMPRESSOR 2A, TRANSITION	
1Q1	DISCONNECT SWITCH, POWER DISTRIBUTION	
1Q2	CIRCUIT BREAKER, POWER DISTRIBUTION	
1Q3	DISCONNECT SWITCH, POWER DISTRIBUTION	
1Q4	CIRCUIT BREAKER, POWER DISTRIBUTION	
1R1	RESISTOR, TRANSITION, COMPRESSOR 1A, LINE A	
1R2	RESISTOR, TRANSITION, COMPRESSOR 1A, LINE B	
1R3	RESISTOR, TRANSITION, COMPRESSOR 1A, LINE C	
1R4	RESISTOR, TRANSITION, COMPRESSOR 2A, LINE A	
1R5	RESISTOR, TRANSITION, COMPRESSOR 2A, LINE B	
1R6	RESISTOR, TRANSITION, COMPRESSOR 2A, LINE C	
1T1	TRANSFORMER, CONTROL POWER	

2309-7597 LAYOUT
RTWD/RTUD CONTROL PANEL COMPONENT LOCATION

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SIMILAR TO:



1R4	RESISTOR, TRANSITION, COMPRESSOR 2A, LINE A
1R5	RESISTOR, TRANSITION, COMPRESSOR 2A, LINE B
1R6	RESISTOR, TRANSITION, COMPRESSOR 2A, LINE C
1T1	TRANSFORMER, CURRENT, POWER
1T2	TRANSFORMER, CURRENT, COMPRESSOR 1A, LINE A
1T3	TRANSFORMER, CURRENT, COMPRESSOR 1A, LINE B
1T4	TRANSFORMER, CURRENT, COMPRESSOR 1A, LINE C
1T5	TRANSFORMER, CURRENT, COMPRESSOR 2A, LINE A
1T6	TRANSFORMER, CURRENT, COMPRESSOR 2A, LINE B
1T7	TRANSFORMER, CURRENT, COMPRESSOR 2A, LINE C
1T8	TRANSFORMER, POTENTIAL, UNDER/OVER VOLTAGE - POWER METER, LINE A TO B
1T9	TRANSFORMER, POTENTIAL, POWER METER, LINE B TO C
1T10	TRANSFORMER, POTENTIAL, POWER METER, LINE A TO C
1T11	TRANSFORMER, POTENTIAL, POWER METER, LINE A TO B
1T12	TRANSFORMER, POTENTIAL, POWER METER, LINE B TO C
1T13	TRANSFORMER, POTENTIAL, POWER METER, LINE A TO C
1X1	POWER DISTRIBUTION BLOCK
1X2	POWER DISTRIBUTION BLOCK
1X4	TERMINAL STRIP, CUSTOMER CONTROL WIRING
1X5	TERMINAL STRIP, FACTORY CONTROL WIRING
1X6	TERMINAL STRIP, FACTORY POWER METER WIRING
1X7	POWER DISTRIBUTION BLOCK
1X8	POWER DISTRIBUTION BLOCK
1X9	TERMINAL STRIP, WATER FLOW SENSOR CONTROL WIRING
1X10	TERMINAL STRIP, VENTILATION
1X11	TERMINAL STRIP, FAN CONTROL
5BT8	TEMPERATURE SENSOR, OUTDOOR AIR TEMPERATURE

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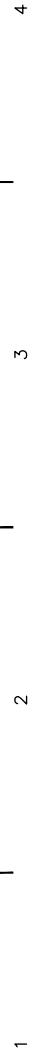
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- 2 WYE DELTA COMPONENTS; MAY NOT BE PRESENT ON ALL UNITS.
- 3 REFER TO RTWD/RTUD ELECTRICAL SCHEMATIC FOR SPECIFIC ELECTRICAL CONNECTION INFORMATION AND NOTES PERTAINING TO WIRING INSTALLATION.
- 4 ONLY PRESENT WHEN VENTILATION IS REQUIRED.
- 5 1A31 MAY OPTIONALLY BE INSTALLED IN PLACE OF 1A9.
- 6 FOR TACANIC PRODUCE UNIT 1A32 MAY OPTIONALLY BE INSTALLED IN PLACE OF 1A11. 1A33 MAY OPTIONALLY BE INSTALLED IN PLACE OF 1A12. 1A34 MAY OPTIONALLY BE INSTALLED IN PLACE OF 1A24. 1A40 MAY OPTIONALLY BE INSTALLED IN PLACE OF 1A8. INSTALL 1A39 ON 1A9 AND USED AT THE SAME TIME.



Dimensions

Unit Dimensions

Figure 7. RTWD, 70 to 150 tons SE, 60 to 120 tons HE, 50 Hz

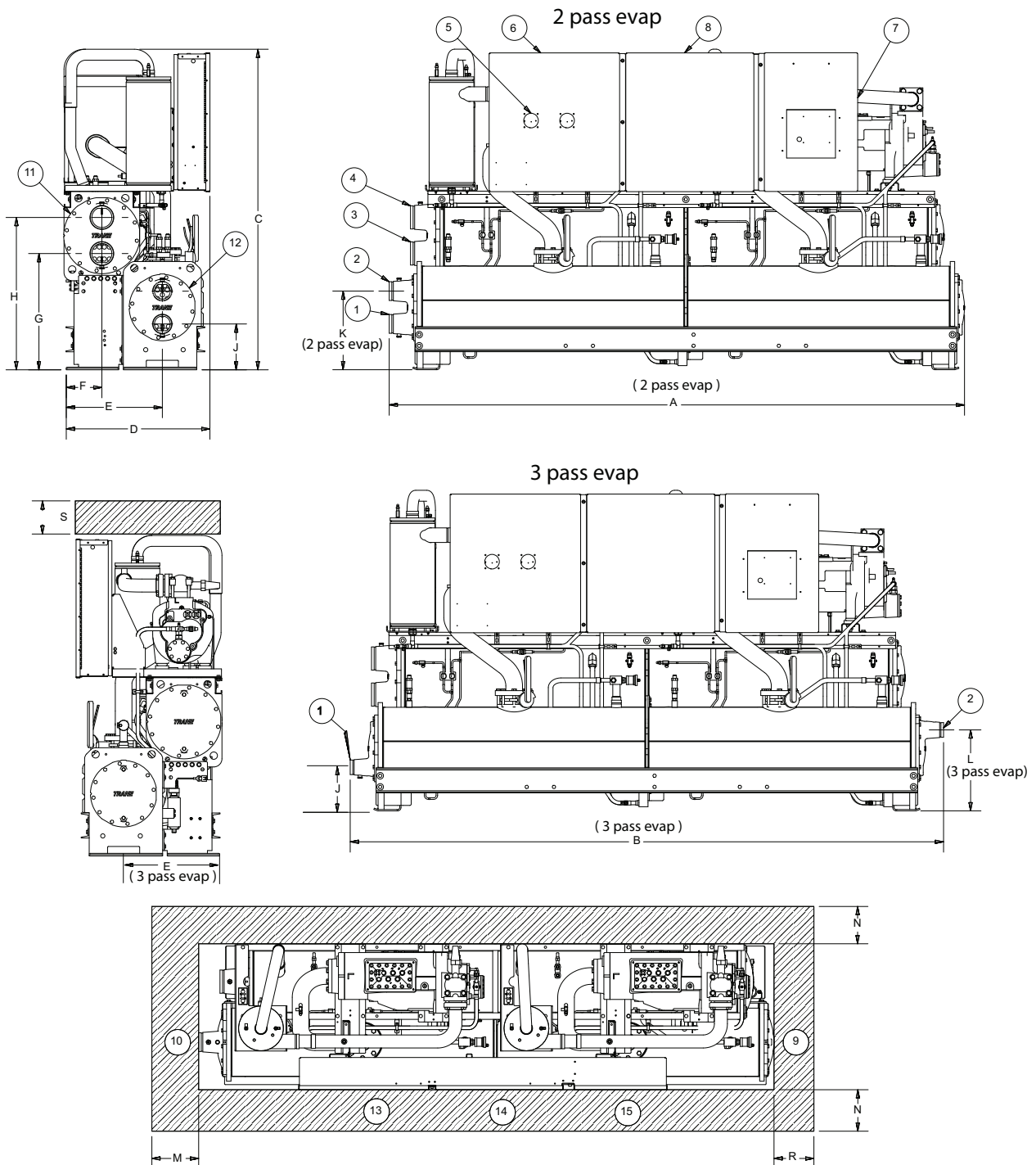


Table 15. RTWD, 70 to 150 tons SE, 60 to 120 tons HE, 50 Hz

RTWD	Standard Efficiency		High Efficiency		
	70,80,90,100,110T	120,130,140,150T	60,70,80T	90T	100,110,120T
A (2 pass evap)	138.2 (3510)	138.8 (3525)	126.4 (3210)	127.0 (3225)	127.0 (3225)
B (3 pass evap)	142.6 (3621)	145.6 (3621)	130.8 (3321)	130.7 (3320)	130.7 (3320)
C	75.9 (1929)	76.9 (1955)	76.1 (1933)	76.1 (1933)	76.9 (1955)
D	34.3 (871)	34.8 (884)	35.1 (890)	35.1 (890)	35.1 (890)
E	23.6 (600)	23.6 (600)	23.6 (600)	23.6 (600)	23.6 (600)
F	9.1 (231)	9.1 (231)	9.1 (231)	9.1 (231)	9.1 (231)
G	27.9 (709)	27.9 (709)	27.9 (709)	27.9 (709)	27.9 (709)
H	36.6 (929)	36.6 (929)	36.6 (929)	36.6 (929)	36.6 (929)
J (2 pass evap)	11.0 (280)	10.6 (268)	10.8 (273)	11.8 (299)	11.8 (299)
J (3 pass evap)	10.4 (265)	10.1 (256)	10.2 (258)	11.3 (287)	11.3 (287)
K (2 pass evap)	18.9 (479)	19.2 (487)	18.6 (472)	20.4 (519)	20.4 (519)
L (3 pass evap)	19.5 (495)	19.5 (496)	19.2 (488)	19.2 (487)	19.2 (487)
M	36 (914)	36 (914)	36 (914)	36 (914)	36 (914)
N*	36 (914)*	36 (914)*	36 (914)*	36 (914)*	36 (914)*
R	127 (3226)	127 (3226)	115 (2921)	115 (2921)	115 (2921)
S	36 (914)	36 (914)	36 (914)	36 (914)	36 (914)

Reference

- 1** Evaporator Water Inlet
 - 2** Evaporator Water Outlet
 - 3** Condenser Water Inlet
 - 4** Condenser Water Outlet
 - 5** Power Disconnect
 - 6** Power Wire
 - 7** Control Wire
 - 8** Control Panel
 - 9** Condenser Return Waterbox End - minimum clearance (for tube removal)
 - 10** Condenser Supply Waterbox End - minimum clearance (for maintenance)
 - 11** Condenser
 - 12** Evaporator
 - 13** Panel Power Section - door swing 31.3 inch (796.9 mm)
 - 14** Panel Power Section - door swing 31.1 inch (790.1 mm)
 - 15** Panel Control Section - door swing 22.4 inch (568.14 mm)
- * 42 inch (1067 mm) clearance required to other ground parts, two units with panels facing each other or other live parts require a clearance of 48 inch (1220 mm)
- ** Sound attenuator may increase the footprint - submittal should be used.

Dimensions

Figure 8. RTWD, 130 to 250 tons HE, 160 to 200 tons PE, 50 Hz

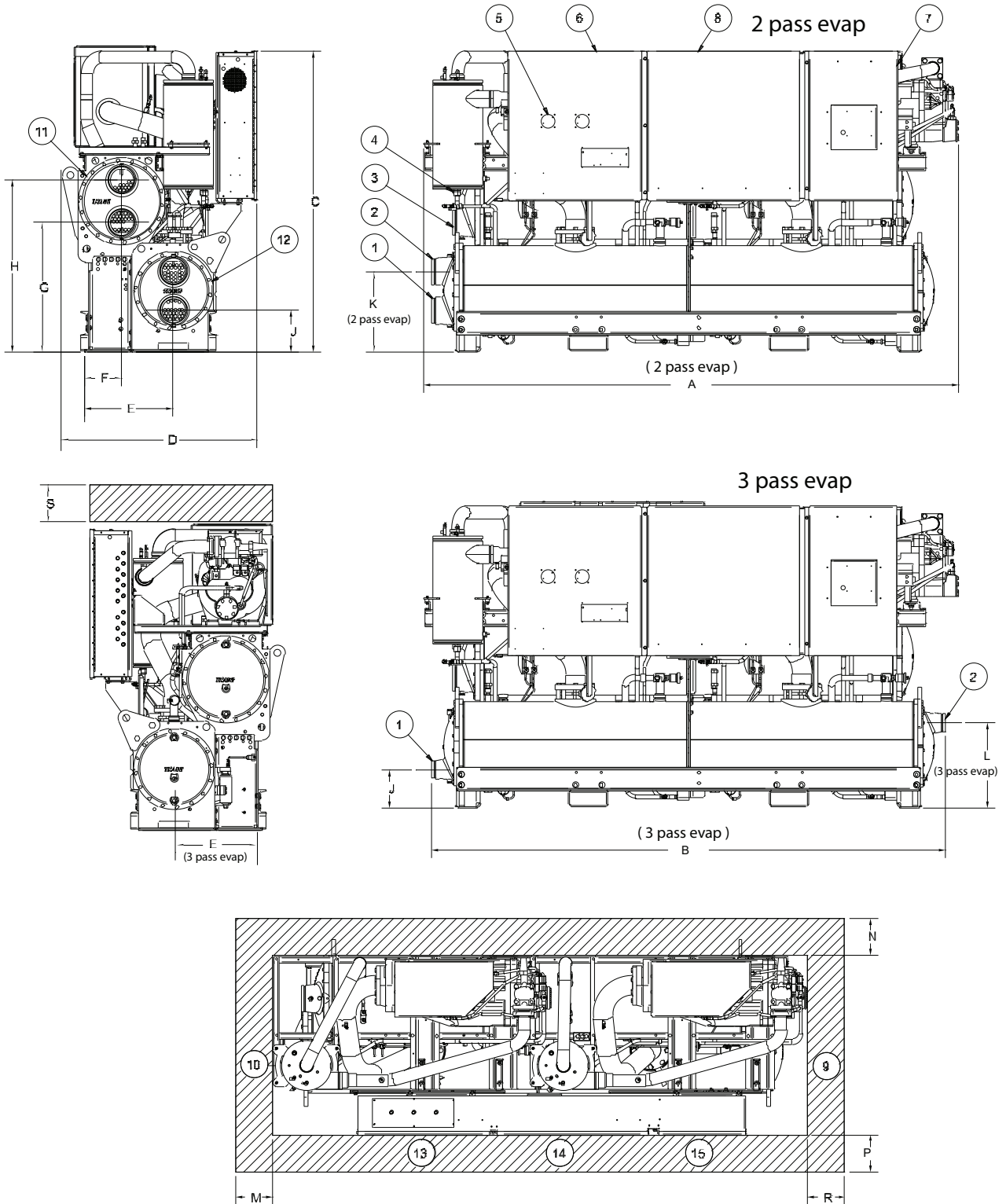


Figure 9. RTWD, 130 to 250 tons HE, 160 to 200 tons PE, 50 Hz - in (mm)

RTWD	High Efficiency		Premium Efficiency	
	130, 140, 160, 180T	200, 220, 250T	160, 180T	200T
A (2 pass evap)	132.3 (3360)	136.1 (3456)	147.9 (3755)	136.1 (3456)
B (3 pass evap)	132.8 (3371)	136.1 (3456)	150.8 (3831)	136.1 (3456)
C	75.6 (1920)	76.8 (1949)	76.8 (1950)	76.9 (1955)
D	47.3 (1202)	47.8 (1213)	47.3 (1202)	47.8 (1213)
E	24.6 (624)	24.8 (630)	24.6 (624)	24.8 (630)
F	11.1 (282)	11.6 (295)	11.1 (282)	11.6 (295)
G	32.7 (830)	33.1 (840)	33.8 (860)	33.1 (840)
H	42.4 (1078)	43.9 (1115)	43.6 (1108)	43.9 (1115)
J (2 pass evap)	10.1 (256)	10.6 (270)	10.6 (270)	10.6 (270)
J (3 pass evap)	9.5 (241)	9.7 (247)	9.7 (247)	9.7 (247)
K (2 pass evap)	19.3 (490)	20.6 (524)	20.6 (524)	20.6 (524)
L (3 pass evap)	19.9 (505)	21.6 (549)	21.6 (550)	21.6 (549)
M	36.0 (914)	36.0 (914)	36.0 (914)	36.0 (914)
N	36.0 (914)	36.0 (914)	36.0 (914)	36.0 (914)
P*	40 (1016)*	40 (1016)*	40 (1016)*	40 (1016)*
R	114.8 (2916)	114.8 (2916)	134.5 (3416)	134.5 (3416)
S	36.0 (914)	36.0 (914)	36.0 (914)	36.0 (914)

Reference

- 1 Evaporator Water Inlet
- 2 Evaporator Water Outlet
- 3 Condenser Water Inlet
- 4 Condenser Water Outlet
- 5 Power Disconnect
- 6 Power Wire
- 7 Control Wire
- 8 Control Panel
- 9 Condenser Return Waterbox End - minimum clearance (for tube removal)
- 10 Condenser Supply Waterbox End - minimum clearance (for maintenance)
- 11 Condenser
- 12 Evaporator
- 13 Panel Power Section - door swing 31.3 inch (796.9 mm)
- 14 Panel Power Section - door swing 31.1 inch (790.1 mm)
- 15 Panel Control Section - door swing 22.4 inch (568.14 mm)

Control panel clearance is 36 or 40 inch (914 or 1016 mm) depending on voltages, starter type, unit application and local code; 42 inch (1067 mm) clearance required to other grounded parts; two units with panels facing each other or other live parts require a clearance of 48 inch (1220 mm).

- * Sound attenuator may increase the footprint - submittal should be used.
- **

RTWD Unit Footprint

Figure 10. Unit footprint

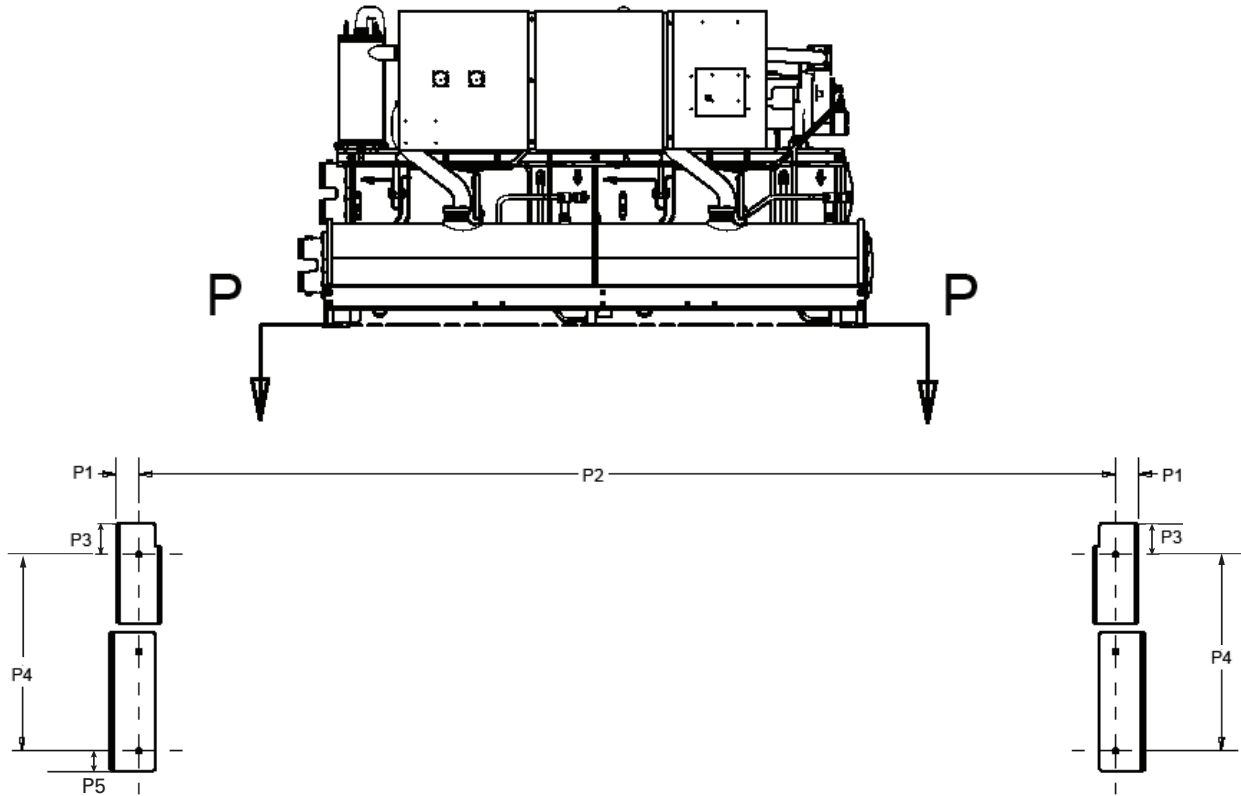


Table 16. RTWD unit footprint

Dimension	Standard Efficiency		High Efficiency 60-120T (50Hz)		High Efficiency 130-250T (50Hz) Premium Efficiency 200T (50Hz)		Premium Efficiency 160-180 (50Hz)	
	inch	mm	inch	mm	in	mm	inch	mm
P1	3.68	93.5	3.68	93.5	3.68	93.5	3.68	93.5
P2	123.78	3144	111.97	2844	111.97	2844	131.65	3344
P3	2.43	61.8	2.43	61.8	4.3	109.3	4.3	109.3
P4	24.93	633.2	24.9	633.2	24.9	633.2	24.9	633.2
P5	2.5	64	2.5	64	2.5	64	2.5	64

Note: Base hole diameters all 0.63 inch (16 mm).



Weights

RTWD

Table 17. Weights – RTWD – 50 Hz

Model	Standard Efficiency				High Efficiency				Premium Efficiency			
	Operating		Shipping		Operating		Shipping		Operating		Shipping	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
60	-	-	-	-	5706	2588	5525	2506	-	-	-	-
70	5874	2664	5677	2575	5724	2596	5534	2510	-	-	-	-
80	6030	2735	5807	2634	5893	2673	5680	2576	-	-	-	-
90	6186	2806	5937	2693	6319	2866	6063	2750	-	-	-	-
100	6268	2843	6010	2726	6412	2908	6145	2787	-	-	-	-
110	6332	2872	6074	2755	6495	2946	6220	2821	-	-	-	-
120	6903	3131	6614	3000	6914	3136	6619	3002	-	-	-	-
130	7337	3328	7015	3182	8188	3709	7848	3555	-	-	-	-
140	7342	3330	7020	3184	8256	3784	7895	3606	-	-	-	-
150	7395	3354	7049	3197	-	-	-	-	-	-	-	-
160	-	-	-	-	8353	3740	7963	3576	9061	4110	8595	3885
180	-	-	-	-	8770	3980	8351	3789	9581	4346	9032	4097
200	-	-	-	-	9740	4426	9242	4200	10060	4563	9467	4294
220	-	-	-	-	9778	4442	9268	4211	-	-	-	-
250	-	-	-	-	9943	4517	9383	4263	-	-	-	-

Note: Weights include optional base rail fork lifting. Subtract 300 lbs (136.1 kg) if this option is not selected.



Mechanical Specifications

General

Exposed metal surfaces are painted with air-dry beige, direct-to-metal, single-component paint. Each RTWD unit ships with full operating charges of refrigerant and oil. Molded elastomeric isolation pads are supplied for placement under all support points.

Compressor and Motor

The unit is equipped with two semi-hermetic, direct-drive, 3000 rpm 50 Hz rotary compressors that include a load/unload valve, rolling element bearings, oil filtration device and heater. The motor is a suction gas-cooled, hermetically sealed, two-pole squirrel cage induction motor. Oil separator device is provided separate from the compressor. Check valves in the compressor discharge and lube oil system and a solenoid valve in the lube system are also provided.

Unit-Mounted Starter

The unit is supplied with a UL 1995 indoor type enclosure with top power-wiring access and three-phase, overload protection. The starter is available in a wye-delta or across-the-line configuration, factory-mounted and fully pre-wired to the compressor motor and control panel. A factory-installed, factory-wired 820 VA control power transformer provides all unit control power (120 Vac secondary) and Trane CH530 module power (24 Vac secondary). Optional starter features include circuit breaker, high fault panel with circuit breaker, or mechanical, non-fused disconnect.

Evaporator

Dual circuited, shell and tube falling film evaporator design is used. Seamless internally finned, copper tubes are mechanically expanded into tube sheets and mechanically fastened to tube supports. Evaporator tubes are 1.0 inch (25.4 mm) diameter on standard efficiency chillers and 0.75 inch (19.05 mm) diameter on high and premium efficiency chillers. All tubes can be individually replaced.

Shells and tube sheets are made of carbon steel. Designed, tested, and stamped in accordance with ASME code. The evaporator is designed for refrigerant-side/working-side pressure of 200 psig (13.8 bars).

All water pass arrangements are available with grooved connections with 150 psig (10.5 bars) waterside working pressure. Waterside shall be hydrostatically tested at 225 psig (15.5 bars).

Condenser

Dual circuited, shell and tube condenser designed with seamless internally/externally finned tubes expanded into tube sheets and mechanically fastened to tube supports. Condenser tubes are 1.0 inch (25.4 mm) diameter on standard efficiency chillers and 0.75 inch (19.05 mm) diameter on high and premium efficiency chillers. All tubes can be individually replaced.

Shells and tube sheets are made of carbon steel. Designed, tested, and stamped in accordance with ASME code. The condenser is designed for refrigerant-side/working-side pressure of 300 psig (20.7 bars).

Water side has single inlet and outlet piping connection. All water pass arrangements are available with grooved connections with 150 psig (10.5 bars) waterside working pressure. Waterside shall be hydrostatically tested at 225 psig (15.5 bars).

Standard temperature condenser allows for leaving condenser water temperature up to 105°F (40.6°C) and for entering condenser water temperatures up to 95°F (35°C).

Refrigerant Circuit

Each unit has two refrigerant circuits, with one rotary screw compressor per circuit. Each refrigerant circuit includes compressor suction and discharge service valves, removable core filter, charging port, sight glass and an electronic expansion valve. Modulating compressors and electronic expansion valves provide variable capacity modulation over the entire building load and maintain proper refrigerant flow. The RTWD also includes liquid line isolation valves and refrigerant pressure relief valves installed on each circuit of both the evaporator and condenser.

Oil Management

The unit is configured with an oil management system that ensures proper oil circulation throughout the unit. The key components of the system include an oil separator, oil filter and gas pump. An optional oil cooler is installed when the unit is used for high condensing temperature or low evaporator temperature conditions. For example: remote condensers, heat recovery, water-to-water heat pump, ice making and low temperature process applications.

Unit Controls (Trane CH530)

The microprocessor-based control panel is factory-installed and factory-tested. The control system is powered by a pre-wired control power transformer, and will load and unload the chiller through adjustment of the compressor slide valve. Microprocessor-based chilled water reset based on return water is standard.

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

The panel includes machine protection shutdown requiring *manual reset* for the following conditions:

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

The panel also includes machine protection shutdown with *automatic reset* for the following correctable conditions:

- Momentary power loss
- Under/over voltage
- Loss of evaporator or condenser water flow

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



Clear Language Display Panel

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

Data contained in available reports includes:

- Water and air temperatures
- Refrigerant levels and temperatures
- Oil pressure
- Flow switch status
- EXV position
- Head pressure control command
- Compressor starts and run-time
- Line phase percent RLA, amps, and volts

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

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

Quality Assurance

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

Electrical Options

Across-the-Line Starter

Across-the-line starter is unit mounted with a UL 1995 enclosure.

Wye-Delta Starter

This option provides a reduced-inrush, unit mounted starter with a UL 1995 enclosure. Wye-delta starters are standard with 200–230 V machines.

Circuit Breaker

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

High Fault Rated Control Panel with Circuit Breaker

A molded case circuit breaker, factory pre-wired with terminal block power connections and equipped with a lockable external operator handle, is available to disconnect the chiller from main power. The control panel has a higher short circuit rating as determined by UL 508.

Non-Fused Disconnect

A non-fused molded case disconnect switch, factory pre-wired with terminal block power connections and equipped with a lockable external operator handle, is available to disconnect the chiller from main power.

Dual Point Power Connection

Unit is available with either dual or single point power connections.

Under/Over-Voltage Protection

Unit receives protection against variations in voltage (current lag and spike protection is standard).



Mechanical Specifications

Control Options

BACnet Interface

BACnet® communications capabilities are available, with communication link via single twisted-pair wiring to communication board.

Chilled Water Reset – Outdoor Air Temperature

Controls, sensors, and safeties allow reset of chilled water temperature, based on temperature signal, during periods of low outdoor air temperature (chilled water reset based on return chilled water temperature is standard).

Condenser Leaving Water Temperature Control

Enables the unit to use the leaving condenser water temperature to load and unload the chiller relative to the leaving condenser water setpoint. The control system allows for a condenser leaving temperature range of 80°F (26.7°C) to 140°F (60°C) with a water to water heat pump.

Condenser Differential Pressure Output

Provides a 2–10 Vdc signal based on the system refrigerant differential pressure and time at the differential with customer defined endpoints.

Condenser Water Control Output

Provides a highly configured signal designed to control a condenser water regulating valve.

External Chilled Water or Hot Water Setpoint

External chilled or hot water setpoint signal can be field wired to a factory-installed, tested interface board through a 2–10 Vdc or 4–20 mA signal.

External Current-Limiting

External current-limit setpoint is communicated to a factory-installed, tested communication board through a 2–10 Vdc or 4–20 mA signal.

LonTalk®/Tracer Summit Interface

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

Motor Current Analog Output

Control system indicates the active chiller percent of full run load amps, based on a 2–10 Vdc.

Power Meter

Tracks energy consumption (compressors only) with kWh meter.

Programmable Relays

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

Time of Day Scheduling

Time of day scheduling capabilities are available for scheduling single chiller applications through Trance CH530 panel (without the need for building automation system-BAS). This feature allows the user to set up to 10 events in a 7 day time period.

Other Options

Base Rail Forklifting

Channels built into the base frame allow for easy movement using a forklift.

Dual Relief Valve

Unit comes with dual relief valves on both the high pressure side and low pressure side of each refrigerant circuit. Each dual relief valve configuration includes an isolation valve. Single relief valves are standard.

Flanged Water Connection Kit

Kit to convert all four water connections (RTWD units) from grooved pipe to flanged connections. This includes: grooved couplings, pipe offsets, and grooved to flange adapters.

Flow Switches - Factory Installed

Factory installed IFM effector flow switches for the evaporator and/or condenser.

Flow Switches - Field Installed

NEMA 1 or NEMA 4 150 psi flow switches ship with the unit.

High-Temperature Condenser

Optimized compressors, oil cooler and high condenser temperature control panel allows for leaving condenser water temperatures up to 140°F (60°C). This option is required for entering condenser water temperatures above 95°F (35°C).

Insulation

The evaporator, water boxes, and motor housing are covered with factory installed 0.75 inch (19.05 mm) insulation. Factory installed foam insulation is used on the suction line, liquid level sensor, oil return system assembly (with its associated piping).

Insulation for High Humidity

The evaporator and water boxes are covered with factory installed 1.5 inch (38.1 mm) insulation. Factory installed foam insulation is used on the motor housing, suction line, liquid level sensor, and oil return system assembly (with its associated piping).

Isolators

Molded elastomeric isolators ship with the unit.

Low-Temperature Evaporator

Optimized compressors and oil cooler enable evaporator operation down to minimum leaving water temperature of 10°F (-12.2°C).

Nitrogen Charge

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

Performance Tests

Performance and witness tests are available, based on requested operating points, to certify chiller performance in accordance with AHRI Standard 550/590.



Mechanical Specifications

Rapid Restart™ Test

After completion of a standard full load witness test, power to the chiller will be cut and then reapplied to demonstrate the chiller's rapid restart capabilities for disaster relief.

Smooth-Bore Condenser Tubes

Smooth-bore copper or premium copper-nickel condenser tubes, 0.75 inch (19.05 mm) in diameter with 0.035 inch (0.889 mm) wall thickness, are available for high fouling water applications.

Two-Way Condenser Water Regulating Valve

For water regulation, a field-installed, 2-way butterfly-type (lug-style) valve and field-mounted valve actuator, is available. The 2-way valve is field-wired and controlled by the chiller regulating valve control output. The single-phase, dual frequency, 50 or 60 Hz, motor can be selected with 115V (can be powered directly from control power transformer at unit) or 220V power.

Note: *Separate 220 volt power must be field supplied for 220V water regulating valve option.*

Valves are available in 3 and 4 inch (88.9 mm and 114.3 mm) sizes.

Seismic Rating - IBC

The unit is built and certified for seismic applications in accordance with the following International Building Code (IBC) releases 2000, 2003, 2006 and 2009.

Seismic Rating - OSHPD

The unit is built and certified for seismic applications in accordance with OSHPD. The unit is factory modified with reinforced steel anchors welded to the base.

Sound Reduction Package

Acoustical treatment for compressors can be factory or field installed.

Water-to-Water Heat Pump

Optimized compressors, oil cooler and high condenser temperature control panel allows for leaving condenser water temperatures up to 140°F (60°C). This option allows for entering condenser water temperatures above 95°F (35°C). Condenser leaving water temperature control option is required; the setpoint range is 80°F (26.7°C) to 140°F (60°C).



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