TRANE®

Product Catalog

Series R™ Helical Rotary Water-Cooled Liquid Chillers

Model RTWD

235—835 kW - Made in China

June 2009

RLC-PRC030-EN

Introduction

To meet a wide range of applications in the water-cooled market, Trane is proud to introduce the model RTWD helical-rotary liquid chiller. The introduction of this next-generation chiller is an exciting step forward in application versatility, ease of installation, control precision, reliability, energy-efficiency, and operational cost-effectiveness. The new RTWD 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 New Features

- Higher full-load energy efficiency that 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.
- HFC-134a optimized design.

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.

Table of Contents

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 ±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 inter operability.

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. 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. An optional nitrogen charge can reduce the time and labor for projects expecting disassembly.
- Optional iIntegrated 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™ 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 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 ±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.
- 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 entering condenser water temperatures below 12.8°C, or between 7.2°C and 12.8°C, when a temperature increase of 0.56°C per minute to 12.8°C is not possible.

When the application requires startup temperatures below the prescribed minimums, a variety of system implementation options are available including the use of a 2- or 3-way valve or tower bypass to maintain the required system refrigerant differential pressure.

- 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.
- Tower bypass may also be a valid control method if the chiller temperature requirements can be maintained and the loop is small.

The minimum acceptable refrigerant pressure differential between condenser and evaporator is 1.7 bars at all load conditions in order to ensure adequate oil circulation. Condenser leaving water temperature must be 9.5°C higher than evaporator leaving water temperature within 2 minutes of startup. A 13.9°C temperature difference must be maintained thereafter [this differential requirement is lessened by 0.14°C for every 0.56°C that the condenser leaving water temperature is above 12.8°C].

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 RTWD has excellent capability to maintain leaving water temperature control within +/-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 RTWD. 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 +/-0.28°C leaving evaporator temperature control. For applications in which system energy savings is most important and tight temperature control is classified as +/-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.

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.

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.

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-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 contaminates 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.

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.*

Model Number Descriptions

Digits 01, 02, 03, 04 – Chiller Model

RTWD = Water Cooled Chiller Series R™

Digit 05, 06, 07 – 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 Tons
200 = 200 Nominal Tons
220 = 220 Nominal Tons
250 = 250 Nominal Tons

Digit 08 – Unit Voltage

C= 380/50/3

Digit 09 – Manufacturing Plant

3 = Taicang, China

Digit 10, 11 – Design Sequence

** = First Design, etc. increment when parts are affected for service purposes

Digits 12 – Unit Type

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

Digit 13 – Agency Listing

0 = No Agency Listing
C = Manufactured to GB Standards

Digit 14 – Pressure Vessel Code

4 = Chinese Code-China Built Vessel
S = Special

Digit 15 – Unit Application

A = Std Condenser <=35°C Entering Water Temperature
B = High Temperature Condenser >35°C Entering Water Temperature
C = Water-to-Water Heat Pump

Digit 16 – Pressure Relief Valve

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

Digit 17 – Water Connection Type

B = Flanged Connection - Metric

Digit 18 – Evaporator Tubes

A = Internal and External Enhanced Evap Tube

Digit 19 – Number of Evap Passes

1 = 2 Pass Evaporator
2 = 3 Pass Evaporator

Digit 20 – Evaporator Water Side Pressure

A = 10.5 bar Evaporator Water Pressure
S = 300 psi/20.6 bar Evap 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

Digit 23 – Condenser Water Side Pressure

1 = 0.5 Bar Condenser Water Pressure
S = 300 psi/20.6 bar Cond Water Pressure

Digit 24 – Compressor Starter Type

Y = Wye-Delta Closed Transition Starter
X = Across-the-Line 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 Connection for Incoming Lines
B = Mechanical Disconnect Switch
D = 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 = Dyna-View/English
B = Dyna-View/Spanish
C = Dyna-View/Spanish-Mexico
D = Dyna-View/French
E = Dyna-View/German
F = Dyna-View/Dutch
G = Dyna-View/Italian
H = Dyna-View/Japanese
J = Dyna-View/Portuguese-Portugal
K = Dyna-View/Portuguese-Brazil
L = Dyna-View/Korean
M = Dyna-View/Thai
N = Dyna-View/Simplified Chinese
P = Dyna-View/Traditional Chinese
R = Dyna-View/Russian
T = Dyna-View/Polish
U = Dyna-View/Czech
V = Dyna-View/Hungarian
W = Dyna-View/Greek
X = Dyna-View/Romanian
Y = Dyna-View/Swedish

Digit 29 – Remote Interface (Digital Comm)

0 = No Remote Digital Communication
1 = LonTalk/Tracer Summit Interface
2 = Time of Day Scheduling

Digit 30 – External Water & Current-Limit Setpoint

0 = No External Water & Current-Limit Setpoint
A = External Water & Current-Limit Setpoint - 4–20 mA
B = External Water & 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 Relays
A = Programmable Relays

Digit 33 – Condenser Refrigerant Pressure Output Option

0 = No Condenser Refrigerant Output
1 = Condenser Water Control Output
2 = Condenser Pressure (%HPC) Output
3 = Differential Pressure Output

Digits 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 40 – Installation Accessories

0 = No Installation Accessories
A = Elastomeric Isolators

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

Digit 42 – 2-Way Water Regulating Valve

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

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 (R134a)
1 = Nitrogen Charge

Digit 46 – Base Rail Forklifting

0 = No Base Rail Forklifting
B = Base Rail Forklifting

Digit 47 – Label and Literature Language

D = English
F = Chinese - Simple

Digit 48 – Special

0 = None
S = Special

Digit 49 – 55

0 = None

Digit 56 – Shipping Package

0 = No Skid (Standard)
1 = Skid

Digit 59 – Performance Test Options

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
H = Witness 2 Point Test with Report
J = Witness 3 Point Test with Report
K = Witness 4 Point Test with Report

General Data

Table 1. General Data - 50 Hz - standard efficiency

Size		70	80	90	100	110	120	130	140	150
Compressor										
Nominal Tons		35/35	35/40	40/40	40/50	50/50	50/60	60/60	60/70	70/70
Quantity		2	2	2	2	2	2	2	2	2
Evaporator										
Water Storage	(L)	42.2	47.6	53.0	53.0	53.0	61.5	66.8	66.8	72.2
2 Pass Arrangement										
Water Conn. Size	(mm)	100	100	100	100	100	125	125	125	125
Minimum Flow	(L/s)	4.9	5.6	6.4	6.4	6.4	6.9	7.7	7.7	8.4
Maximum Flow	(L/s)	17.7	20.5	23.2	23.2	23.2	25.2	28.0	28.0	30.7
3 Pass Arrangement										
Water Conn. Size	(mm)	80	80	80	80	80	100	100	100	100
Minimum Flow	(L/s)	3.3	3.8	4.3	4.3	4.3	4.6	5.1	5.1	5.6
Maximum Flow	(L/s)	11.8	13.6	15.4	15.4	15.4	16.8	18.6	18.6	20.4
Condenser										
Water Storage	(L)	46.8	53.6	60.4	63.8	63.8	70.1	79.2	79.2	84.8
Water Conn. Size	(mm)	125	125	125	125	125	125	125	125	125
Minimum Flow	(L/s)	5.2	6.3	7.3	7.8	7.8	8.5	9.9	9.9	10.8
Maximum Flow	(L/s)	18.9	22.7	26.5	28.4	28.4	31.0	36.0	36.0	39.2
General Unit										
Refrigerant Type		R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
# Refrig Circuits		2	2	2	2	2	2	2	2	2
% Minimum Load										
Refrigerant Charge	(Kg)	52	51	50	50	51	59	58	59	59
Oil Charge	(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 - 50 Hz - high efficiency

Size		60	70	80	90	100	110	120
Compressor								
Nominal Tons		30/30	35/35	35/40	40/40	40/50	50/50	50/60
Quantity		2	2	2	2	2	2	2
Evaporator								
Water Storage	(L)	37.0	40.2	45.2	57.9	57.9	62.3	65.4
2 Pass Arrangement								
Water Conn. Size	(mm)	100	100	100	125	125	125	125
Minimum Flow	(L/s)	4.6	5.1	5.8	7.1	7.1	7.8	8.2
Maximum Flow	(L/s)	16.6	18.3	21.2	25.8	25.8	28.2	30.0
3 Pass Arrangement								
Water Conn. Size	(mm)	80	80	80	100	100	100	100
Minimum Flow	(L/s)	3.1	3.4	3.9	4.7	4.7	5.2	5.5
Maximum Flow	(L/s)	11.0	12.2	14.1	17.1	17.1	18.8	19.9
Condenser								
Water Storage	(L)	45.1	45.1	52.2	58.1	62.7	62.7	68.3
Water Conn. Size	(mm)	125	125	125	125	125	125	125
Minimum Flow	(L/s)	5.5	5.5	6.7	7.4	8.2	8.2	9.1
Maximum Flow	(L/s)	20.0	20.0	24.4	26.9	29.8	29.8	33.3
General Unit								
Refrigerant Type		R134a	R134a	R134a	R134a	R134a	R134a	R134a
# Refrig Circuits		2	2	2	2	2	2	2
Refrigerant Charge	(kg)	45/45	45/45	44/44	55/55	55/56	55/55	54/54
Oil Charge	(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.

Table 3. General Data – 50 Hz – high efficiency (continued)

Size		130	140	160	180	200	220	250
Compressor								
Quantity		2	2	2	2	2	2	2
Evaporator								
Water Storage	(L)	72.6	77.0	84.5	91.5	108.3	113.3	120.3
2 Pass Arrangement								
Water Conn. Size	(mm)	125	125	125	125	150	150	150
Minimum Flow	(L/s)	8.9	9.5	10.7	11.8	13.3	14.1	15.1
Maximum Flow	(L/s)	32.5	35.0	39.2	43.1	48.8	51.6	55.5
3 Pass Arrangement								
Water Conn. Size	(mm)	100	100	100	100	100	100	100
Minimum Flow	(L/s)	5.9	6.4	7.1	7.8	8.9	9.4	10.1
Maximum Flow	(L/s)	21.7	23.3	26.2	28.7	32.5	34.4	37.0
Condenser								
Water Storage	(L)	81.7	86.8	93.0	99.2	117.8	117.8	133.3
Water Conn. Size	(mm)	150	150	150	150	150	150	150
Minimum Flow	(L/s)	10.0	10.9	11.9	13.0	15.4	15.4	18.0
Maximum Flow	(L/s)	36.8	40.0	43.8	47.6	56.5	56.5	66.1
General Unit								
Refrigerant Type		R-134a	R-134a	R-134a	R-134a	R-134a	R-134a	R-134a
# Refrig Circuits		2	2	2	2	2	2	2
Refrigerant Charge	(kg)	61/61	60/62	61/61	60/62	81/81	80/83	82/82
Oil Charge	(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 – 50 Hz – premium efficiency

Size		160	180	200
Compressor				
Quantity		2	2	2
Evaporator				
Water Storage	(L)	72.6	77.0	84.5
2 Pass Arrangement				
Water Conn. Size	(mm)	125	125	125
Minimum Flow	(L/s)	8.9	9.5	10.7
Maximum Flow	(L/s)	32.5	35.0	39.2
3 Pass Arrangement				
Water Conn. Size	(mm)	100	100	100
Minimum Flow	(L/s)	5.9	6.4	7.1
Maximum Flow	(L/s)	21.7	23.3	26.2
Condenser				
Water Conn. Size	(mm)	150	150	150
Minimum Flow	(L/s)	10.0	10.9	11.9
Maximum Flow	(L/s)	36.8	40.0	43.8
General Unit				
Refrigerant Type		R-134a	R-134a	R-134a
# Refrig Circuits		2	2	2
Refrigerant Charge	(kg)	61/61	60/62	61/61
Oil Charge	(L)	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.

Performance Data

Table 5. Performance Data - standard efficiency units

		Leaving Condenser Water Temperature (°C)								
		32			37			42		
Model	Leaving Chilled Water Temperature	Cooling Capacity	Power Input	COP	Cooling Capacity	Power Input	COP	Cooling Capacity	Power Input	COP
RTWD	(°C)	(kW)	(kW)		(kW)	(kW)		(kW)	(kW)	
70	5	251	50	5.0	237	55	4.2	222	62	3.6
	7	270	50	5.3	254	56	4.5	238	63	3.8
	9	289	51	5.6	272	57	4.8	256	63	4.0
80	5	288	58	5.0	271	64	4.2	253	72	3.5
	7	309	58	5.3	291	65	4.5	273	73	3.7
	9	331	59	5.6	312	66	4.7	293	73	4.0
90	5	328	65	5.0	308	73	4.2	287	82	3.5
	7	351	66	5.3	331	74	4.5	310	82	3.7
	9	376	67	5.6	355	74	4.7	333	83	4.0
100	5	349	69	5.0	328	78	4.2	307	87	3.5
	7	374	70	5.3	353	78	4.5	330	87	3.8
	9	400	71	5.6	378	79	4.8	355	88	4.0
110	5	370	74	5.0	349	82	4.2	327	92	3.5
	7	396	74	5.3	374	83	4.5	351	93	3.8
	9	424	75	5.6	401	84	4.8	376	93	4.0
120	5	415	82	5.1	391	91	4.3	367	102	3.6
	7	446	83	5.4	421	92	4.5	394	103	3.8
	9	478	84	5.7	451	93	4.8	423	103	4.1
130	5	451	88	5.1	426	98	4.3	399	110	3.6
	7	484	89	5.4	457	99	4.6	429	110	3.9
	9	519	90	5.8	490	100	4.9	460	111	4.1
140	5	487	96	5.1	460	107	4.3	432	119	3.6
	7	523	97	5.4	494	108	4.6	465	120	3.9
	9	560	98	5.7	530	109	4.9	499	121	4.1
150	5	529	103	5.1	501	114	4.4	472	128	3.7
	7	568	104	5.4	538	115	4.6	507	129	3.9
	9	609	105	5.8	577	117	4.9	544	130	4.2

1. Performance based on evaporator delta T 5°C, condenser delta T 5°C, evaporator fouling factor of 0.01761°K·m³/kW and condenser fouling of 0.044025°K·m³/kW.
2. Performance is based on 2 pass evaporator configuration.
3. kW input is for compressors only.
4. COP–Coefficient of Performance. Power inputs include compressors and control power.
5. Consult Trane representative for additional performance information.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Table 6. Performance Data - high efficiency units

		Leaving Condenser Water Temperature (°C)								
		32			37			42		
Model	Leaving Chilled Water Temperature	Cooling Capacity	Power Input	COP	Cooling Capacity	Power Input	COP	Cooling Capacity	Power Input	COP
RTWD	(°C)	(kW)	(kW)		(kW)	(kW)		(kW)	(kW)	
60	5	227	42	5.4	214	46	4.6	199	52	3.8
	7	245	42	5.8	230	47	4.9	216	52	4.1
	9	263	42	6.1	248	47	5.2	232	52	4.4
70	5	268	49	5.4	252	54	4.6	236	61	3.8
	7	288	49	5.8	271	55	4.9	254	61	4.1
	9	308	50	6.1	291	56	5.2	273	62	4.4
80	5	307	57	5.4	289	63	4.5	270	71	3.8
	7	330	57	5.7	311	64	4.8	291	71	4.1
	9	353	58	6.0	334	65	5.1	313	72	4.3
90	5	353	65	5.4	332	72	4.6	310	81	3.8
	7	380	66	5.8	358	73	4.9	334	81	4.1
	9	407	66	6.1	384	74	5.2	360	82	4.4
100	5	377	69	5.5	355	76	4.6	332	85	3.9
	7	405	69	5.8	382	77	4.9	358	86	4.1
	9	435	70	6.2	410	78	5.3	385	87	4.4
110	5	404	73	5.5	380	81	4.7	356	91	3.9
	7	434	73	5.9	409	82	5.0	383	91	4.2
	9	466	74	6.2	440	82	5.3	412	92	4.5
120	5	438	79	5.5	413	89	4.6	386	99	3.9
	7	470	80	5.8	444	89	5.0	416	99	4.2
	9	504	81	6.2	477	90	5.3	447	100	4.5
130	5	472	86	5.5	446	96	4.6	418	107	3.9
	7	507	87	5.8	479	97	4.9	449	108	4.2
	9	543	88	6.2	514	97	5.3	483	108	4.4
140	5	514	93	5.5	486	104	4.7	456	116	3.9
	7	552	94	5.8	522	105	5.0	491	117	4.2
	9	591	95	6.2	560	106	5.3	527	117	4.5
160	5	559	100	5.6	529	112	4.7	498	124	4.0
	7	601	101	5.9	569	113	5.0	536	125	4.3
	9	644	103	6.2	611	114	5.4	576	126	4.5

Table 6. Performance Data - high efficiency units

		Leaving Condenser Water Temperature (°C)								
		32			37			42		
Model	Leaving Chilled Water Temperature	Cooling Capacity	Power Input	COP	Cooling Capacity	Power Input	COP	Cooling Capacity	Power Input	COP
RTWD	(°C)	(kW)	(kW)		(kW)	(kW)		(kW)	(kW)	
180	5	616	112	5.5	583	125	4.7	548	139	3.9
	7	662	113	5.8	627	126	5.0	590	140	4.2
	9	710	114	6.2	673	127	5.3	634	141	4.5
200	5	677	123	5.5	640	137	4.7	601	153	3.9
	7	726	124	5.8	688	138	5.0	647	154	4.2
	9	778	125	6.2	738	139	5.3	696	155	4.5
220	5	740	136	5.4	701	151	4.6	660	167	3.9
	7	794	138	5.7	753	152	4.9	710	169	4.2
	9	849	140	6.1	807	154	5.2	762	170	4.5
250	5	809	148	5.4	767	163	4.7	724	180	4.0
	7	866	151	5.7	823	165	5.0	778	182	4.3
	9	927	154	6.0	881	168	5.2	834	184	4.5

1. Performance based on evaporator delta T 5 C, condenser delta T 5 C, evaporator fouling factor of 0.01761°K·m³/kW and condenser fouling of 0.044025°K·m³/kW.
2. Performance is based on 2 pass evaporator configuration.
3. kW input is for compressors only.
4. COP–Coefficient of Performance. Power inputs include compressors and control power.
5. Consult Trane representative for additional performance information.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Table 7. Performance Data - premium efficiency units

		Leaving Condenser Water Temperature (°C)								
		32			37			42		
Model	Leaving Chilled Water Temperature	Cooling Capacity	Power input	COP	Cooling Capacity	Power input	COP	Cooling Capacity	Power input	COP
RTWD	(°C)	(kW)	(kW)		(kW)	(kW)		(kW)	(kW)	
160	5	577	99	5.8	545	110	4.9	512	123	4.2
	7	621	100	6.2	587	111	5.3	553	124	4.5
	9	667	102	6.5	632	112	5.6	595	125	4.8
180	5	636	110	5.8	600	122	4.9	564	137	4.1
	7	684	111	6.1	647	123	5.2	608	137	4.4
	9	735	112	6.5	696	125	5.6	655	138	4.7
200	5	684	121	5.6	646	135	4.8	607	151	4.0
	7	735	122	6.0	695	136	5.1	654	151	4.3
	9	788	123	6.4	747	137	5.4	704	152	4.6

1. Performance based on evaporator delta T 5 C, condenser delta T 5 C, evaporator fouling factor of 0.01761°K·m³/kW and condenser fouling of 0.044025°K·m³/kW.
2. Performance is based on 2 pass evaporator configuration.
3. kW input is for compressors only.
4. COP–Coefficient of Performance. Power inputs include compressors and control power.
5. Consult Trane representative for additional performance information.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Table 8. Part Load Performance - standard efficiency units

Unit Size	% Load	Cooling Capacity kW	Power Input kW	COP	IPLV COP
70	100	258.78	53.6	4.83	6.52
	75	194.08	32.3	6.01	
	50	129.39	18.1	7.15	
	25	64.69	10.5	6.19	
80	100	296.75	62.2	4.77	6.56
	75	222.56	37.8	5.89	
	50	148.37	21.0	7.07	
	25	74.19	10.5	7.10	
90	100	337.18	70.5	4.78	6.46
	75	252.80	43.1	5.87	
	50	168.77	23.7	7.12	
	25	84.38	13.5	6.23	
100	100	358.98	74.7	4.80	6.51
	75	269.32	45.9	5.86	
	50	179.31	25.2	7.13	
	25	89.66	13.6	6.58	
110	100	380.78	79.3	4.80	6.37
	75	285.50	49.2	5.81	
	50	190.57	27.0	7.05	
	25	95.28	16.3	5.86	
120	100	427.89	87.9	4.87	6.55
	75	321.01	54.9	5.85	
	50	214.12	29.6	7.23	
	25	106.89	16.3	6.56	
130	100	465.16	94.2	4.94	6.55
	75	349.14	59.3	5.89	
	50	232.76	31.7	7.34	
	25	116.38	19.5	5.95	
140	100	502.43	102.8	4.89	6.54
	75	376.91	64.0	5.89	
	50	251.04	34.7	7.23	
	25	125.52	19.8	6.34	
150	100	546.73	110.2	4.96	6.54
	75	409.96	68.2	6.01	
	50	273.19	37.9	7.20	
	25	136.77	22.7	6.01	

1. Rated in accordance with ARI Standard 550/590, based on evaporator temperature drop of 10°F and 3 gpm/ton on the condenser, evaporator fouling factor of 0.0001°F·ft²·h/Btu and condenser fouling factor of 0.00025°F·ft²·h/Btu.
2. Performance is based on 2 pass evaporator configuration.
3. Consult Trane representative for additional performance information.
4. kW input is for compressors only.

Table 9. Part Load Performance - high efficiency

Unit Size	% Load	Cooling Capacity kW	Power Input kW	COP	IPLV COP
60	100	234.87	44.7	5.26	7.15
	75	176.15	27.3	6.46	
	50	117.43	14.8	7.95	
	25	58.72	8.8	6.67	
70	100	276.71	52.7	5.25	7.10
	75	207.44	31.7	6.54	
	50	138.18	17.8	7.76	
	25	69.26	10.2	6.77	
80	100	316.79	61.1	5.19	7.16
	75	237.68	37.1	6.40	
	50	158.22	20.4	7.78	
	25	79.11	10.3	7.69	
90	100	364.61	69.6	5.23	7.09
	75	273.54	42.4	6.44	
	50	182.13	23.4	7.80	
	25	91.06	13.3	6.84	
100	100	389.57	73.6	5.30	7.20
	75	292.18	45.2	6.46	
	50	194.78	24.5	7.94	
	25	97.39	13.5	7.23	
110	100	417.35	78.0	5.35	7.10
	75	312.92	48.3	6.49	
	50	208.50	26.5	7.87	
	25	104.42	15.9	6.56	
120	100	452.15	85.0	5.32	7.12
	75	339.29	53.0	6.39	
	50	226.08	28.8	7.85	
	25	113.21	16.0	7.09	
130	100	488.02	92.3	5.29	7.00
	75	366.01	58.0	6.30	
	50	244.01	31.0	7.88	
	25	122.00	19.1	6.37	
140	100	531.26	99.9	5.32	7.12
	75	398.36	62.3	6.39	
	50	265.46	33.6	7.92	
	25	132.90	19.3	6.87	
160	100	578.73	107.3	5.39	7.10
	75	433.87	66.4	6.54	
	50	289.36	37.0	7.81	
	25	144.86	22.0	6.56	
180	100	637.45	119.7	5.33	7.16
	75	478.17	74.8	6.39	
	50	318.90	40.3	7.90	
	25	159.27	22.2	7.18	

Table 9. Part Load Performance - high efficiency

Unit Size	% Load	Cooling Capacity kW	Power Input kW	COP	IPLV COP
200	100	699.68	131.2	5.34	7.05
	75	524.93	82.6	6.36	
	50	349.84	44.2	7.90	
	25	175.10	27.5	6.37	
220	100	765.07	145.4	5.26	7.02
	75	573.81	89.6	6.40	
	50	382.54	49.8	7.68	
	25	191.27	27.9	6.85	
250	100	836.45	158.3	5.29	6.92
	75	627.25	96.1	6.52	
	50	418.05	56.3	7.43	
	25	209.20	32.0	6.54	

1. Rated in accordance with ARI Standard 550/590, based on evaporator temperature drop of 10°F and 3 gpm/ton on the condenser, evaporator fouling factor of 0.0001°F·ft²·h/Btu and condenser fouling factor of 0.00025°F·ft²·h/Btu.
2. Performance is based on 2 pass evaporator configuration.
3. Consult Trane representative for additional performance information.
4. kW input is for compressors only.

Table 10. Part Load Performance - premium efficiency

Unit Size	% Load	Cooling Capacity kW	Power Input kW	COP	IPLV COP
160	100	597.01	106.0	5.63	7.43
	75	447.93	65.5	6.84	
	50	298.51	36.4	8.21	
	25	149.43	21.9	6.80	
180	100	657.84	117.6	5.59	7.56
	75	493.29	73.4	6.72	
	50	329.09	39.1	8.41	
	25	164.55	22.1	7.43	
200	100	707.76	129.2	5.48	7.23
	75	530.56	81.3	6.54	
	50	353.71	43.4	8.14	
	25	176.85	27.3	6.49	

1. Rated in accordance with ARI Standard 550/590, based on evaporator temperature drop of 10°F and 3 gpm/ton on the condenser, evaporator fouling factor of 0.0001°F·ft²·h/Btu and condenser fouling factor of 0.00025°F·ft²·h/Btu.
2. Performance is based on 2 pass evaporator configuration.
3. Consult Trane representative for additional performance information.
4. kW input is for compressors 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 and ice making
  - Water temperatures and setpoints
  - 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:
    i. Chilled water
    ii. Current-limit
    iii. Condenser leaving hot water temperature setpoint
    iv. Ice building
- Reports, listed on a single tabbed screen for easy access, including:
  - 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
  - Flow switch status
  - EXV position
  - Head pressure control command
  - 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.

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 unequaled 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.

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.

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:

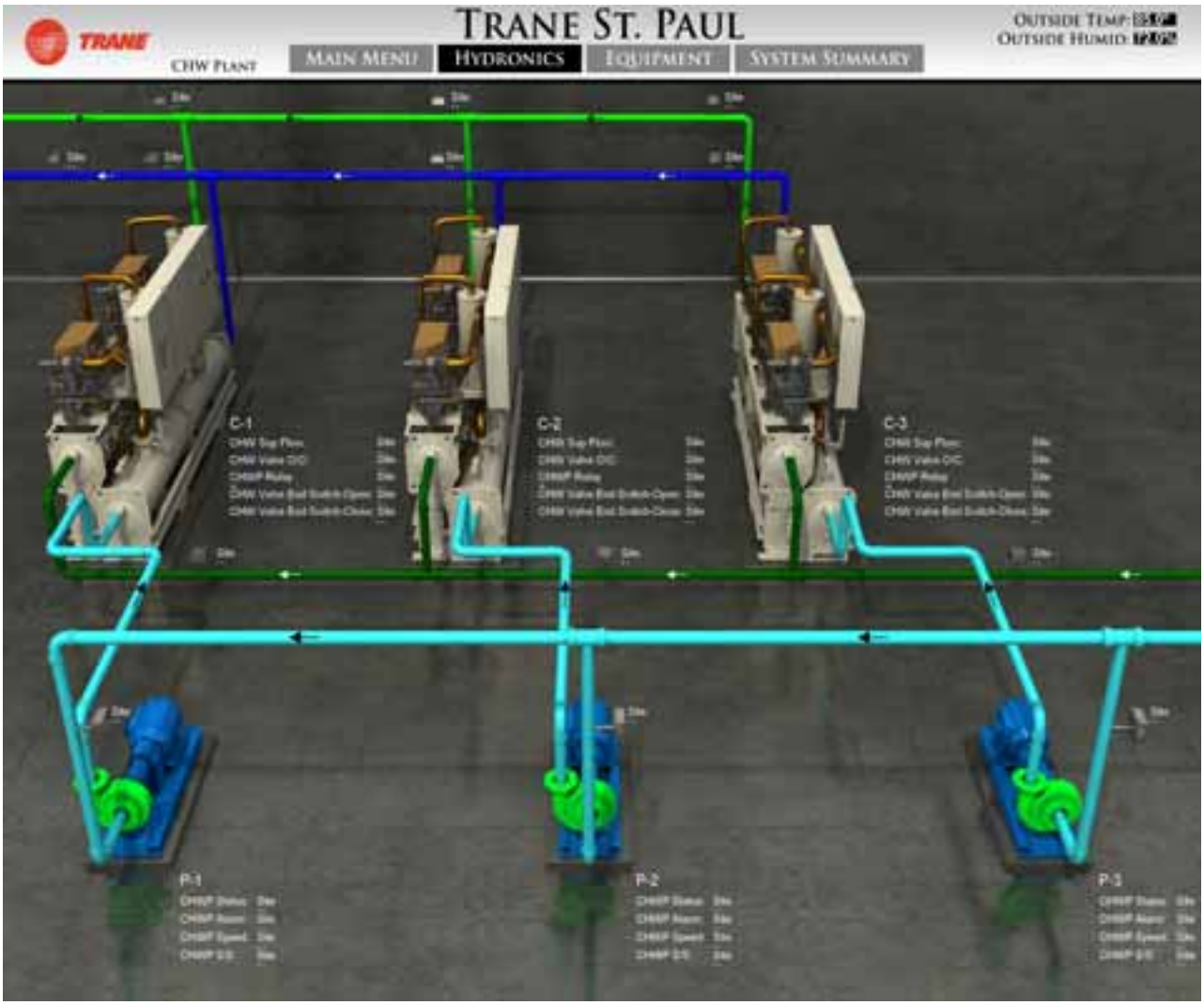
- External chilled water setpoint
- External current-limit setpoint
- Condenser leaving hot water temperature setpoint
- Ice making initiation

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


TRANE
CHW PLANT
TRANE ST. PAUL
MAIN MENU
HYDRONICS
EQUIPMENT
SYSTEM SUMMARY
OUTSIDE TEMP:
OUTSIDE HUMID:
C-1
C-2
C-3
P-1
P-2
P-3

Electrical Data

Table 11. Electrical Data - 50 Hz- standard efficiency, standard condenser temperatures

			Unit Wiring		Motor Data		
Unit ID	**Rated Voltage**	**# Power Connections**	**MCA Ckt 1/Ckt 2**	**Wire (mm)**	**RLA Ckt 1/Ckt 2**	**LRA Y Ckt 1/Ckt 2**	**LRA X-L Ckt 1/Ckt 2**
RTWD 70	380/50/3	1	111	35	48/48	129/129	427/427
	380/50/3	2	63/61	16/16			
RTWD 80	380/50/3	1	130	50	48/63	129/144	427/462
	380/50/3	2	63/79	16/16			
RTWD 90	380/50/3	1	144	50	63/63	144/144	462/462
	380/50/3	2	81/79	25/16			
RTWD 100	380/50/3	1	160	70	63/76	144/180	462/589
	380/50/3	2	81/95	25/25			
RTWD 110	380/50/3	1	173	70	76/76	180/180	589/589
	380/50/3	2	97/95	25/25			
RTWD 120	380/50/3	1	190	70	76/89	180/217	589/668
	380/50/3	2	97/112	25/35			
RTWD 130	380/50/3	1	203	95	89/89	217/217	668/668
	380/50/3	2	114/112	35/35			
RTWD 140	380/50/3	1	222	95	89/104	217/259	668/796
	380/50/3	2	114/130	35/50			
RTWD 150	380/50/3	1	237	95	104/104	259/259	796/796
	380/50/3	2	132/130	50/50			

1. MCA-Minimum Circuit Ampacity
2. RLA-Rated Load Amps.
3. LRA-Locked Rotor Amps - Based on full winding starts.
4. LRA WD–Locked Rotor Amps in Wye configuration. LRA XL–Locked Rotor Amps in the Delta configuration.
5. Local codes may take precedence.
6. Data containing information on two circuits shown as follows: circuit 1/circuit 2.
7. Standard condensing temperature option refers to entering condenser water temperatures 35°C and below.

Table 12. Electrical Data - 50 Hz - high efficiency, standard condenser temperatures

		Unit Wiring			Motor Data		
Unit ID	**Rated Voltage**	**# Power Conns**	**MCA Ckt 1/Ckt 2**	**Wire (mm)**	**RLA Ckt 1/Ckt 2**	**LRA Y Ckt 1/Ckt 2**	**LRA X-L Ckt 1/Ckt 2**
RTWD 60	380/50/3	1	92	25	40/40	112/112	370/370
	380/50/3	2	52/50	10/10			
RTWD 70	380/50/3	1	109	35	47/47	129/129	427/427
	380/50/3	2	61/59	16/10			
RTWD 80	380/50/3	1	127	50	47/62	129/144	427/462
	380/50/3	2	61/78	16/16			
RTWD 90	380/50/3	1	142	50	62/62	144/144	462/462
	380/50/3	2	80/78	16/16			
RTWD 100	380/50/3	1	158	70	62/75	144/180	462/589
	380/50/3	2	80/93	16/25			
RTWD 110	380/50/3	1	170	70	75/75	180/180	589/589
	380/50/3	2	96/93	25/25			
RTWD 120	380/50/3	1	187	70	75/88	180/217	589/668
	380/50/3	2	96/111	25/35			
RTWD 130	380/50/3	1	202	70	88/88	217/217	668/668
	380/50/3	2	113/111	35/35			
RTWD 140	380/50/3	1	220	95	88/103	217/259	668/796
	380/50/3	2	113/129	35/35			
RTWD 160	380/50/3	1	235	95	103/103	259/259	796/796
	380/50/3	2	132/129	35/35			
RTWD 180	380/50/3	1	260	120	103/123	259/291	796/896
	380/50/3	2	132/154	35/50			
RTWD 200	380/50/3	1	280	120	123/123	291/291	896/896
	380/50/3	2	157/154	50/50			
RTWD 220	380/50/3	1	311	150	123/148	291/354	896/1089
	380/50/3	2	157/186	50/70			
RTWD 250	380/50/3	1	337	185	148/148	354/354	1089/1089
	380/50/3	2	188/186	70/70			

1. MCA-Minimum Circuit Ampacity
2. RLA-Rated Load Amps.
3. LRA-Locked Rotor Amps - Based on full winding starts.
4. LRA WD–Locked Rotor Amps in Wye configuration. LRA XL–Locked Rotor Amps in the Delta configuration.
5. Local codes may take precedence.
6. Data containing information on two circuits shown as follows: circuit 1/circuit 2.
7. Standard condensing temperature option refers to entering condenser water temperatures 35°C and below.

Table 13. Electrical Data - 50 Hz - high efficiency, high temperature condenser

			Unit Wiring		Motor Data		
Unit ID	**Rated Voltage**	**# Power Conns**	**MCA Ckt 1/Ckt 2**	**Wire (mm)**	**RLA Ckt 1/Ckt 2**	**LRA Y Ckt 1/Ckt 2**	**LRA X-L Ckt 1/Ckt 2**
RTWD 60	380/50/3	1	116	35	51/51	112/112	370/370
	380/50/3	2	65/63	16/16			
RTWD 70	380/50/3	1	140	50	61/61	129/129	427/427
	380/50/3	2	79/76	16/16			
RTWD 80	380/50/3	1	161	70	61/78	129/144	427/462
	380/50/3	2	79/97	16/25			
RTWD 90	380/50/3	1	177	70	78/78	144/144	462/462
	380/50/3	2	100/97	25/25			
RTWD 100	380/50/3	1	196	95	78/93	144/180	462/589
	380/50/3	2	100/116	25/35			
RTWD 110	380/50/3	1	211	95	93/93	180/180	589/589
	380/50/3	2	118/116	35/35			
RTWD 120	380/50/3	1	226	95	93/105	180/217	589/668
	380/50/3	2	118/132	35/50			
RTWD 130	380/50/3	1	232	95	102/102	217/217	668/668
	380/50/3	2	130/128	50/50			
RTWD 140	380/50/3	1	259	120	102/124	217/259	668/796
	380/50/3	2	130/155	50/70			
RTWD 160	380/50/3	1	281	150	124/124	259/259	796/796
	380/50/3	2	157/155	70/70			
RTWD 180	380/50/3	1	309	150	124/147	259/291	796/896
	380/50/3	2	157/183	70/70			
RTWD 200	380/50/3	1	332	185	147/147	291/291	896/896
	380/50/3	2	185/183	75/75			
RTWD 220	380/50/3	1	367	240	147/175	291/354	896/1089
	380/50/3	2	185/219	70/95			
RTWD 250	380/50/3	1	396	240	175/175	354/354	1089/1089
	380/50/3	2	221/219	95/95			

1. MCA-Minimum Circuit Ampacity
2. RLA-Rated Load Amps.
3. LRA-Locked Rotor Amps - Based on full winding starts.
4. LRA WD–Locked Rotor Amps in Wye configuration. LRA XL–Locked Rotor Amps in the Delta configuration.
5. Local codes may take precedence.
6. Data containing information on two circuits shown as follows: circuit 1/circuit 2.
7. High temperature condenser refers to entering condenser water temperatures 35°C and above.

Table 14. Electrical Data – 50 Hz – premium efficiency, standard condensing temperature

		Unit Wiring			Motor Data		
Unit ID	**Rated Voltage**	**# Power Conns**	**MCA Ckt 1/Ckt 2**	**Wire (mm)**	**RLA Ckt 1/Ckt 2**	**LRA WD Ckt 1/Ckt 2**	**LRA XL Ckt 1/Ckt 2**
RTWD 160	380/50/3	1	232	95	102/105	259/259	796/796
	380/50/3	2	130/128	35/35			
RTWD 180	380/50/3	1	259	120	102/123	259/21	796/896
	380/50/3	2	130/154	35/50			
RTWD 200	380/50/3	1	280	120	123/123	291/291	896/896
	380/50/3	2	157/154	50/50			

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

Table 15. Electrical Data – 50 Hz – premium efficiency, high condensing temperature

		Unit Wiring			Motor Data		
Unit ID	**Rated Voltage**	**# Power Conns**	**MCA Ckt 1/Ckt 2**	**Wire (mm)**	**RLA Ckt 1/Ckt 2**	**LRA WD Ckt 1/Ckt 2**	**LRA XL Ckt 1/Ckt 2**
RTWD 160	380/50/3	1	280	150	123/123	259/259	796/796
	380/50/3	2	156/154	70/70			
RTWD 180	380/50/3	1	308	150	123/146	259/291	796/896
	380/50/3	2	156/183	70/70			
RTWD 200	380/50/3	1	331	185	146/146	291/291	896/896
	380/50/3	2	185/183	70/70			

1. MCA–minimum circuit ampacity
2. RLA–rated load amps are rated in accordance with UL Standard 1995.
3. LRA–locked rotor amps are based on full winding starts.
4. LRA WD–Locked Rotor Amps in Wye configuration. LRA XL–Locked Rotor Amps in the Delta configuration.
5. Local codes may take precedence.
6. Data containing information on two circuits shown as follows: circuit 1/circuit 2.
7. High condensing temperature option refers to entering condenser water temperatures above 35°C.

Electrical Connections

Figure 1. Field Wiring Diagram

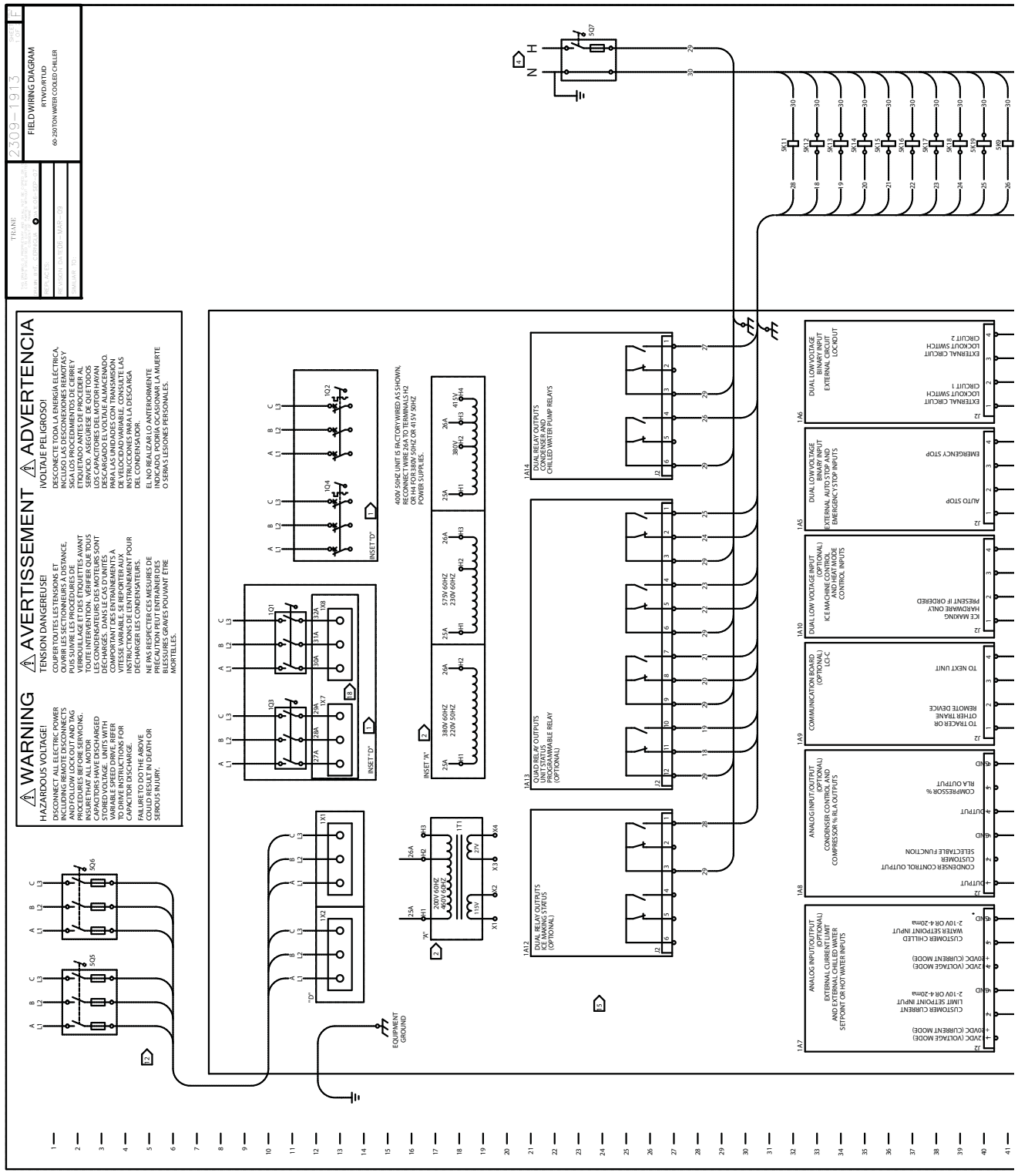


Figure 2. Field Wiring Diagram (continued)

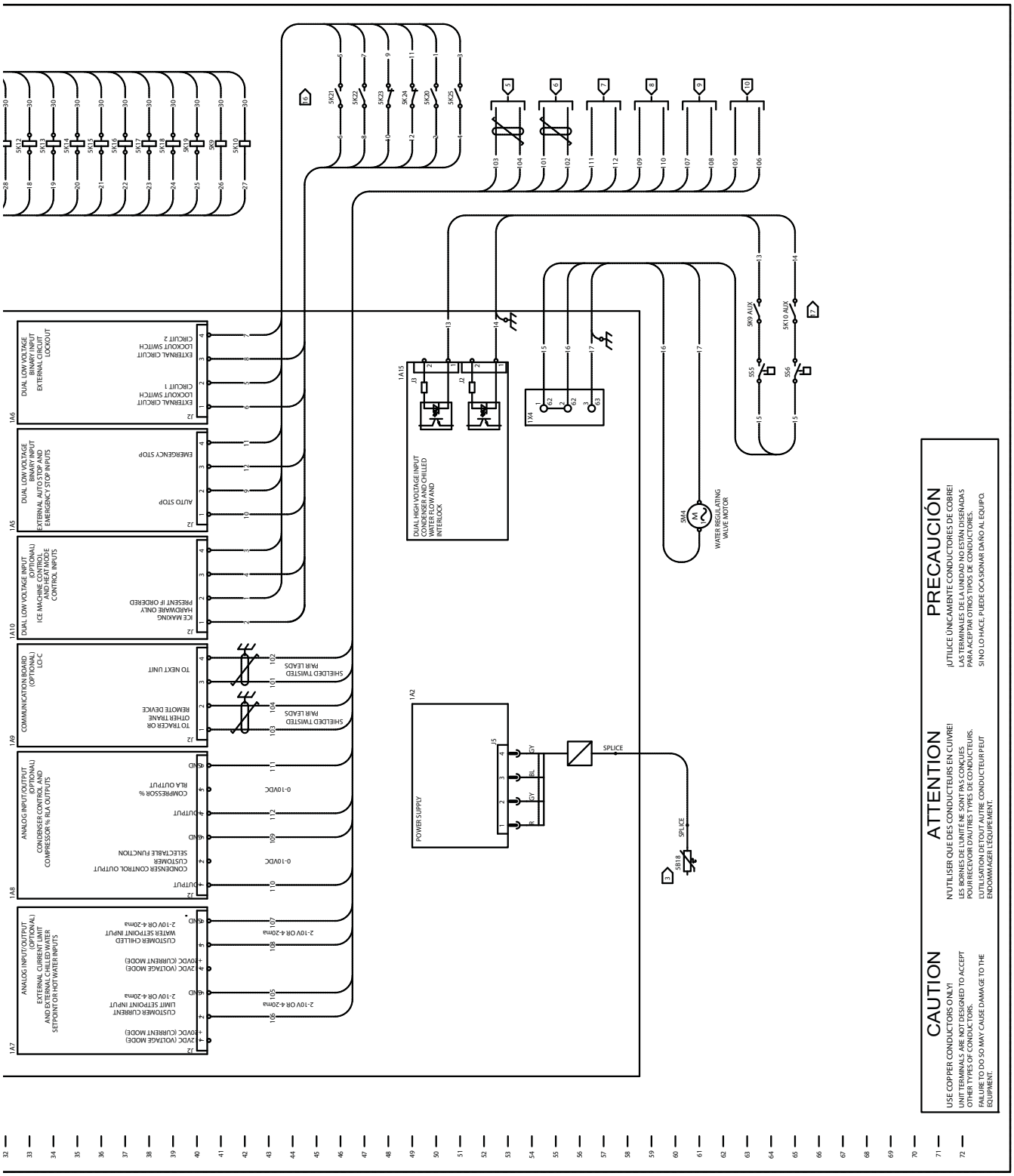


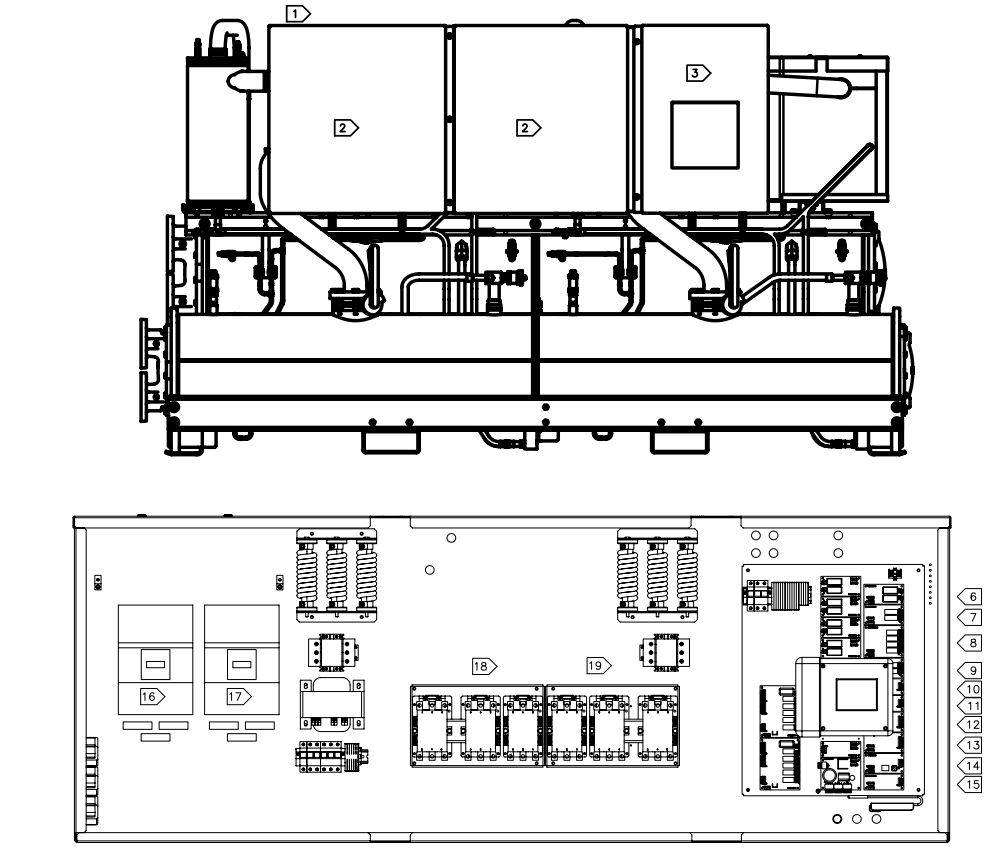
Table 16. Field Wiring Diagram Notes

#	Description
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 dual source power is selected the field connections for circuit #2 are made to 1X2, 1Q3, or 1Q4.
2	400 V/50 Hz 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.
3	Factory installed outdoor air temperature sensor lead length to be spliced and extended by customer.
4	Customer supplied power 220/50/1 to power relays. Max fuse size is 15 amps. Ground all customer supplied power supplied as required by applicable codes. green ground screws are provided in unit control panel.
5	Wired 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.
6	Wired 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
7	Wired to compressor % RLA.
8	Wired to condenser control customer selectable function.
9	Wired to customer chilled water setpoint 2-10 V or 4-20 mA.
10	Wired to customer current limit setpoint 2-10 V or 4-20 mA.
11	Refer to RTWD electrical schematic for specific electrical connection information and notes pertaining to wiring installation.
12	All unit power wiring must be 600 volt copper conductors only and have a minimum temperature insulation rating of 90°C. Refer to unit nameplate for minimum circuit ampacity and maximum overcurrent protection device. Provide an equipment ground in accordance with applicable electric codes.
13	All field wiring must be in accordance with national electric code and local requirements.
14	All customer control circuit wiring must be copper conductors only and have a minimum insulation rating of 300 volts. Except as noted, all customer wiring connection are made to circuit board mounted box lugs with a wire range of 14 to 18 AWG.
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 1/3 HP, 7.2 FLA at 120 volts 60Hz. Contacts are rated for 5 amps general purpose duty 240 volts.
16	Customer supplied contacts for all low voltage connections must be compatible with dry circuit 24 volts DC for a 12 mA resistive load. Silver or gold plated contacts recommended.
17	Flow switch and interlock contacts must be acceptable for use in a 120 volt 1 mA circuit or a 220 volt 2 mA circuit.
18	Only present on "ED" frame molded case switches. 1X7, 1X8, 27A, 28A, 29A, 30A, 31A, and 32A are not present with all other molded case switches.
1A2	Power supply.
1A5	External auto stop and emergency stop inputs, dual low voltage binary input.
1A6	External circuit lockout, circuit 1 and 2, dual low voltage binary input.
1A7	External current limit and external chilled water setpoint or hot water inputs, analog input/output (optional).
1A8	Condenser control and compressor % RLA output, analog input/output (optional).
1A9	LCI-C or Tracer communications, communication board (optional).
1A10	Ice machine control and heat mode control inputs, dual low voltage (optional).
1A12	Ice making status, dual relay outputs (optional).
1A13	Unit status, programmable relay, quad relay outputs (optional).
1A14	Condenser and chilled water pump relays, dual relay outputs.
1A15	Condenser and chilled water flow and interlock, dual high voltage input.

Replaceable Fuse Table

Volts	Hertz	Designation	Class	Quantity	Size (A)
380	**50**	1F13, 14	CC	2	5
		1F18, 19, 20, 21	CC	4	3
		1F16, 17	CC	2	6
		1F15	CC	1	10

Figure 3. Connection Diagram



CAUTION

USE COPPER CONDUCTORS ONLY!

UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF 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 RECEVOIR D'AUTRES TYPES DE CONDUCTEURS.

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 OTROS TIPOS DE CONDUCTORES.

SI NO LO HACE, PUEDE OCASIONAR DAÑO AL EQUIPO.

⚠ WARNING

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.

⚠ AVERTISSEMENT

TENSION DANGEREUSE!

COUPER TOUTES LES TENSIONS ET OUVRIR LES SECTIONNEURS À DISTANCE, PUIS SUIVRE LES PROCÉDURES DE VERROUILLAGE ET DES ÉTIQUETTES AVANT TOUTE INTERVENTION. VÉRIFIER QUE TOUS LES CONDENSATEURS DES MOTEURS SONT DÉCHARGÉS. DANS LE CAS D'UNITÉS COMPORTANT DES ENTRAÎNEMENTS À VITESSE VARIABLE, SE REPORTER AUX INSTRUCTIONS DE L'ENTRAÎNEMENT POUR DÉCHARGER LES CONDENSATEURS.

NE PAS RESPECTER CES MESURES DE PRÉCAUTION PEUT ENTRAÎNER DES BLESSURES GRAVES POUVANT ÊTRE MORTELLES.

⚠ ADVERTENCIA

¡VOLTAJE PELIGROSO!

DESCONECTE TODA LA ENERGÍA ELÉCTRICA, INCLUSO LAS DESCONEXIONES REMOTAS Y SIGA LOS PROCEDIMIENTOS DE CIERRE Y ETIQUETADO ANTES DE PROCEDER AL SERVICIO. ASEGÚRESE DE QUE TODOS LOS CAPACITORES DEL MOTOR HAYAN DESCARGADO EL VOLTAJE ALMACENADO. PARA LAS UNIDADES CON TRANSMISIÓN DE VELOCIDAD VARIABLE, CONSULTE LAS INSTRUCCIONES PARA LA DESCARGA DEL CONDENSADOR.

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

Table 17. Connection Diagram Notes

#	Description		Additional Information
1	Line voltage entrance (see unit nameplate)	location	
2	Power section	location	
3	Controls section	location	
4	Customer control power high voltage entrance	location	
5	Customer control power low voltage entrance	location	
6	Condenser and chilled water flow inputs.	optional	1A15, (5K10 and 5K9)
7	Condenser and chilled water pump relay outputs. Separate 220/50/1 customer power is required.	optional	1A14, (5K10 and 5K9)
8	Unit status programmable relay outputs. Separate 220/50/1 customer power is required.	optional	1A13, (5K12–5K19)
9	Ice making status relay output. Separate 220/50/1 customer power is required.	optional	1A12, (5K11)
10	External auto stop and emergency stop inputs.	standard	1A5, (5K23 and 5K24)
11	External circuit lockout inputs circuit 1 and circuit 2.	standard	1A6, (5K21 and 5K22)
12	External current-limit and chilled water setpoint or hot water inputs.	optional	1A7, (4-20 mA or 2-10 V)
13	Condenser control and compressor % RLA input.	optional	1A8, (4-20 mA or 0-10 V)
14	Tracer Communications	optional	1A9
15	Ice machine control and heat mode control.	optional	1A10, (5K20 and 5K25)
16	Circuit 1 disconnect	optional	1A6
17	Circuit 2 disconnect	optional	1A6
18	Wye-delta closed transition starter or across-the-line starter circuit 1A	location	
19	Wye-delta closed transition starter or across-the-line starter circuit 2A	location	
20	Refer to RTWD electrical schematic for specific electrical connection information and notes pertaining to wiring installation.		

Figure 4. Layout Diagram

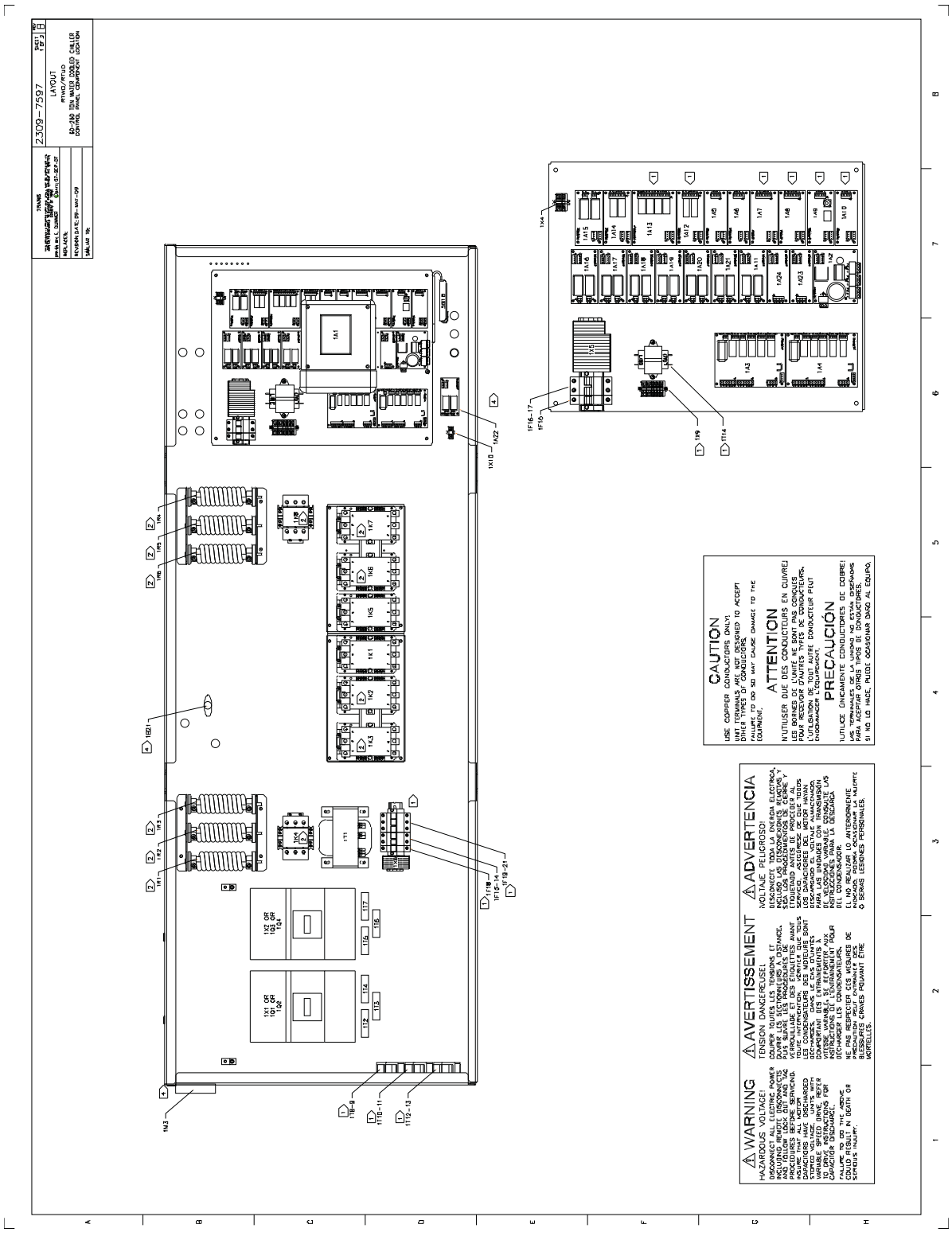


Table 18. Layout Notes

	1A1	Dyna View main processor interface	**	1K3	Contactor, compressor 1A short.
	1A2	Power supply module.	**	1K4	Contactor, compressor 1A transition.
	1A3	Starter module, compressor 1A.		1K5	Contactor, compressor 2A start.
	1A4	Starter module, compressor 2A.	**	1K6	Contactor, compressor 2A run.
	1A5	Dual low voltage input, external auto stop and emergency stop inputs.	**	1K7	Contactor, compressor 2A short.
	1A6	Dual low voltage input, external circuit lockout, refrigerant circuit 1 and 2.	**	1K8	Contactor, compressor 2A transition.
*	1A7	Analog input/output, external current limit and external chilled water or hot water setpoint inputs.	*	1Q1	Disconnect switch, power distribution.
*	1A8	Analog input/output, condenser control and compressor % RLA output.	*	1Q2	Circuit breaker, power distribution.
*	1A9	Dual low voltage input, LCI-C communications (Echelon).	*	1Q3	Disconnect switch, power distribution.
*	1A10	Dual low voltage input, ice machine control and heat mode control.	*	1Q4	Circuit breaker, power distribution.
*	1A11	Dual high voltage input, motor thermostats compressor 2A and 1A.	**	1R1	Resistor, transition, compressor 1A, line A.
*	1A12	Dual relay output, ice making status.	**	1R2	Resistor, transition, compressor 1A, line B.
*	1A13	Quad relay outputs, unit status programmable relays.	**	1R3	Resistor, transition, compressor 1A, line C.
	1A14	Dual relay output, condenser and chilled water pump relays.	**	1R4	Resistor, transition, compressor 2A, line A.
*	1A15	Dual high voltage input, condenser and chilled water flow and interlock.	**	1R5	Resistor, transition, compressor 2A, line B.
	1A16	Dual triac output, modulating unload and load compressor 2A.	**	1R6	Resistor, transition, compressor 2A, line C.
	1A17	Dual triac output, step load control compressor 2A and 1A.		1T1	Transformer, control power.
	1A18	Dual triac output, modulating unload and load compressor 1A.		1T2	Transformer, current, compressor 1A, line A.
	1A19	Dual high voltage input, high pressure cutout compressor 2A and 1A.		1T3	Transformer, current, compressor 1A, line B.
	1A20	Dual triac output, oil return gas pump drain and fill, circuit 2.		1T4	Transformer, current, compressor 1A, line C.
	1A21	Dual triac output, oil return gas pump drain and fill, circuit 1.		1T5	Transformer, current, compressor 2A, line A.
***	1A22	Dual high voltage input, panel ventilation.		1T6	Transformer, current, compressor 2A, line B.
	1A23	Dual low voltage input, oil loss level.		1T7	Transformer, current, compressor 2A, line C.
*	1A24	Dual low voltage input, water flow sensor.	*	1T8	Transformer, potential, under/over voltage - power meter, line A to B.
***	1B21	Thermostat, panel ventilation	*	1T9	Transformer, potential, power meter, line B to C.
	1F13	Fuse, potential transformer primary, compressor 1A, line A, under/over voltage - power meter.	*	1T10	Transformer, potential, power meter, line A to C.
	1F14	Fuse, potential transformer primary, compressor 1A, line B, under/over voltage - power meter.	*	1T11	Transformer, potential, power meter, line A to B.
	1F15	Fuse, control power transformer secondary, 115 V.	*	1T12	Transformer, potential, power meter, line B to C.
	1F16	Fuse, control power transformer secondary, 27 V.	*	1T13	Transformer, potential, power meter, line A to C.
	1F17	Fuse, control power transformer secondary, 27 V.		1T14	Transformer, potential, power meter, line A to B.
*	1F18	Fuse, potential transformer primary, compressor 1A, line C, power meter.		1X1	Power distribution block.
*	1F19	Fuse, potential transformer primary, compressor 2A, line A, power meter.	*	1X2	Power distribution block.
*	1F20	Fuse, potential transformer primary, compressor 2A, line B, power meter.		1X4	Terminal strip, customer control wiring.
*	1F21	Fuse, potential transformer primary, compressor 2A, line C, power meter.		1X5	Terminal strip, factory control wiring.
			*	1X6	Terminal strip, factory power meter wiring.
*	5B18	Temperature sensor, outdoor air temperature.	*	1X9	Terminal strip, factory control wiring.
	1K1	Contactor, compressor 1A start.	***	1X10	Terminal strip, ventilation.
**	1K2	Contactor, compressor 1A run.			

Notes:
* - Optional components; may not be present on all units.
** - Wye-delta components; may not be present on all units.
*** - Only present when ventilation is required.
Refer to RTWD electrical schematic for specific electrical connection information and notes pertaining to wiring installation.

Dimensions

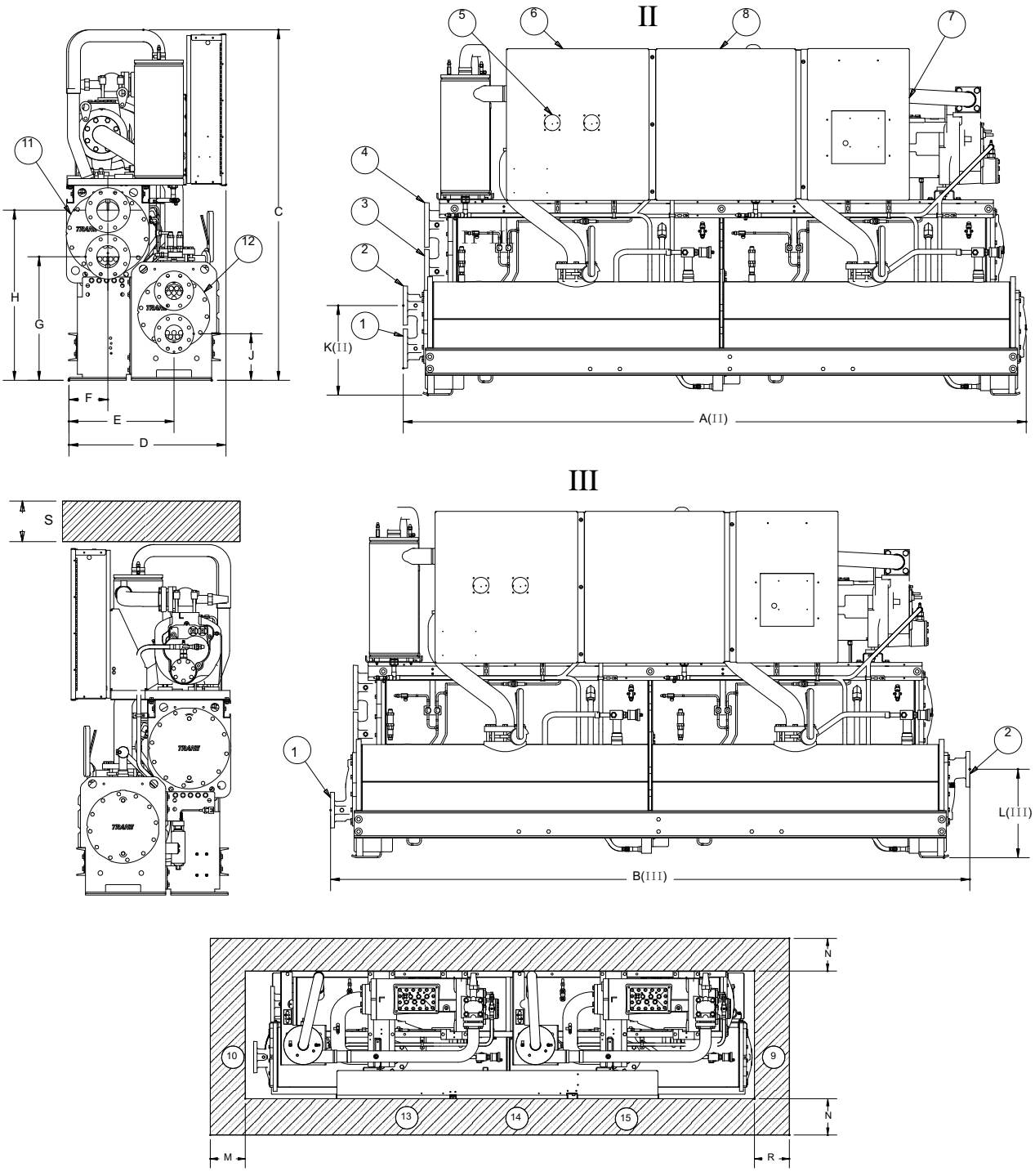


Table 19. 50 Hz Dimensions - 70-150 ton SE, 60-120 ton HE

RTWD	Standard Efficiency		High Efficiency	
	70,80,90,100,110 mm	120,130,140,150 mm	60,70,80 mm	90,100,110,120 mm
A (2 pass evap)	3510	3210	3225	3225
B (3 pass evap)	3620	3620	3320	3320
C	1955	1954	1933	1933
D	890	890	890	890
E	600	600	600	600
F	231	231	231	231
G	709	709	709	709
H	929	929	929	929
J (2 pass evap)	280	268	273	259
J (3 pass evap)	266	256	259	247
K (2 pass evap)	480	488	473	479
L (3 pass evap)	494	496	487	487
M	915	915	915	915
N*	915*	915*	915*	915*
R	3217	3217	3217	3217
S	915	915	915	915

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 796.9 mm)
14	Panel Power Section (door swing 790.1 mm)
15	Panel Control Section (door swing 568.14 mm)
II	2 Pass Evaporator Unit
III	3 Pass Evaporator Unit
*****	1067 mm clearance required to other ground parts, two units with panels facing each other or other live parts require a clearance of 1220 mm.

Dimensions

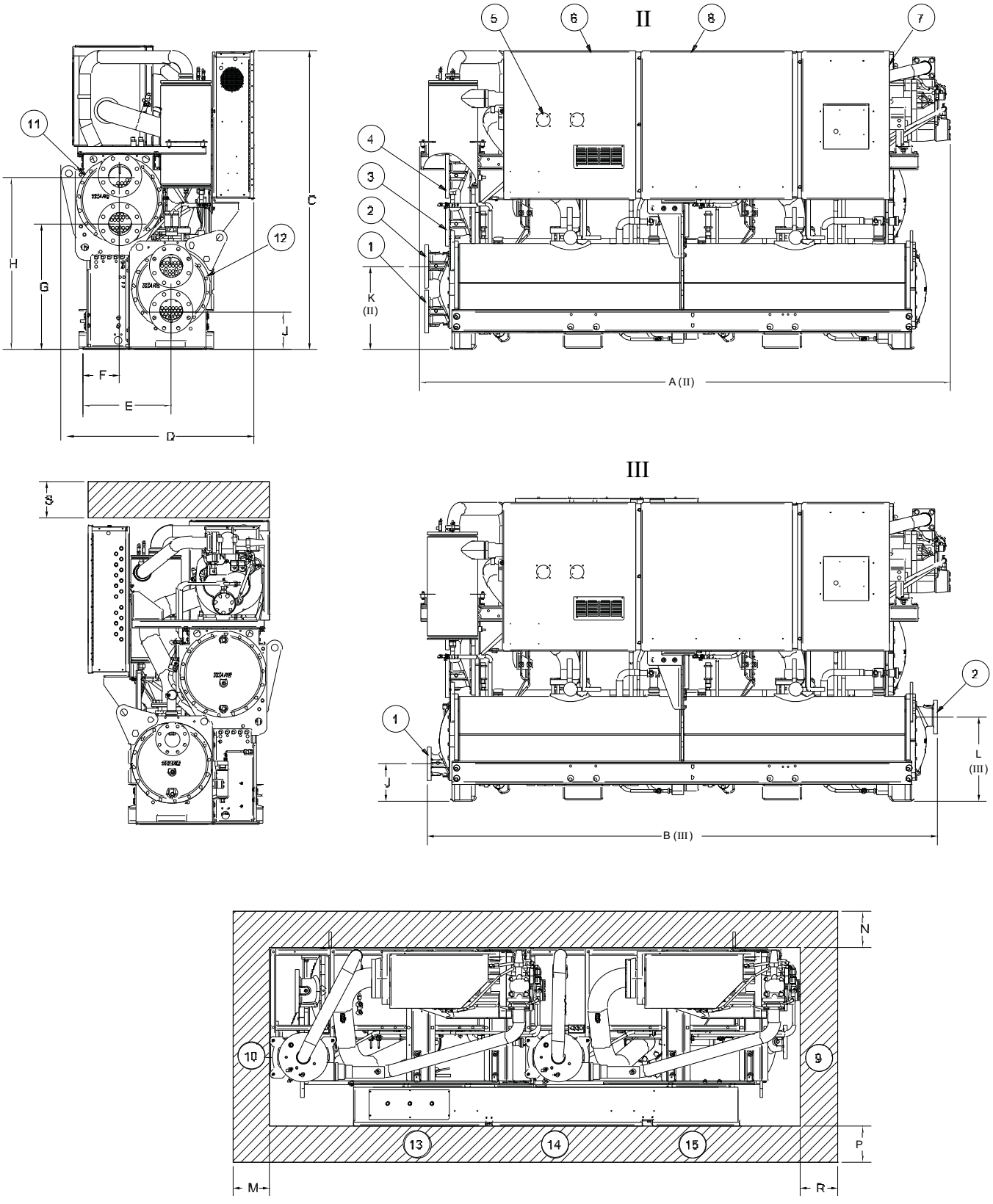

II
III
A (II)
B (III)
K (II)
L (III)
C
H
G
F
E
D
J
S
M
N
P
R
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Table 20. 50 Hz Dimensions - 130-250 ton HE, 160-200 ton PE

RTWD	High Efficiency		Premium Efficiency	
	130, 140, 160, 180 mm	200, 220, 250 mm	160, 180 mm	200 mm
A (2 pass evap)	3360	3456	3755	3472
B (3 pass evap)		3456	3831	3472
C	1920	1955	1950	1955
D	1256	1267	1256	1267
E	547	547	547	547
F	265	265	265	265
G	830	840	860	841
H	1078	1115	1108	1115
J (2 pass evap)	256	270	270	270
J (3 pass evap)	241	247	247	247
K (2 pass evap)	490	524	524	524
L (3 pass evap)	505	549	550	549
M	914	914	914	914
N	914	914	914	914
P*	1016*	1016*	1016*	1016*
R	2916	2916	3416	3416
S	914	914	914	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 796.9 mm]
14	Panel Power Section [door swing 790.1 mm]
15	Panel Control Section [door swing 568.14 mm]
II	2 Pass Evaporator Unit
III	3 Pass Evaporator Unit
*	Control panel clearance is 914 or 1016 mm depending on voltages, starter type, unit application and local code; 1067 mm clearance required to other grounded parts; two units with panels facing each other or other live parts require a clearance of 1220 mm.

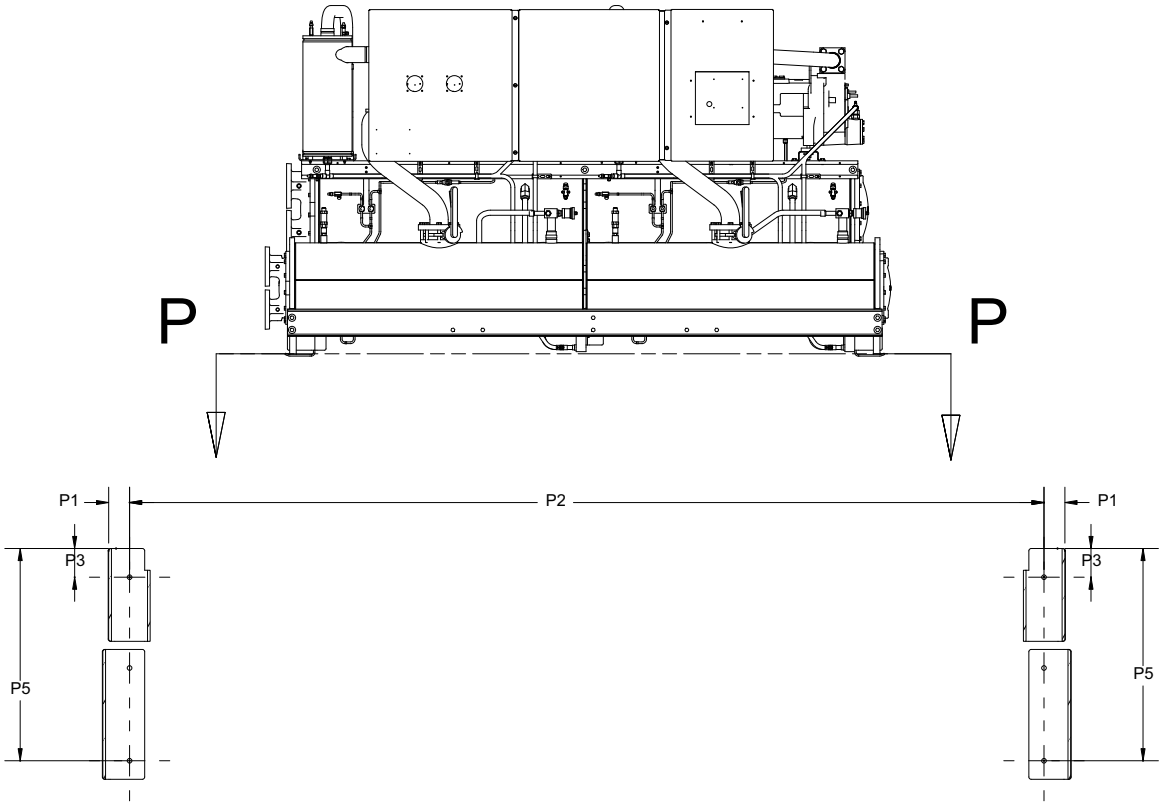


Figure 5. RTWD unit footprint – all sizes

	Standard Efficiency 70-150 ton	High Efficiency 70-120 ton	High Efficiency 130-250 ton Premium Efficiency 200 ton	Premium Efficiency 160-180 ton
	mm	mm	mm	mm
P1	73	73	73	73
P2	3150	2845	2845	3344
P3	99	99	109	109
P4	732	732	743	743

Note: Base hole diameters all 16mm.

Table 21. Weights - 50 Hz - SI units

	Standard Efficiency		High Efficiency		Premium Efficiency	
Model	**Operating Weight (kg)**	**Shipping Weight (kg)**	**Operating Weight (kg)**	**Shipping Weight (kg)**	**Operating Weight (kg)**	**Shipping Weight (kg)**
60	N/A	N/A	2588	2506	N/A	N/A
70	2664	2575	2596	2510	N/A	N/A
80	2735	2634	2673	2576	N/A	N/A
90	2806	2693	2866	2750	N/A	N/A
100	2843	2726	2908	2787	N/A	N/A
110	2872	2755	2946	2821	N/A	N/A
120	3131	3000	3136	3002	N/A	N/A
130	3328	3182	3714	3560	N/A	N/A
140	3330	3184	3745	3581	N/A	N/A
150	3354	3197	N/A	N/A	N/A	N/A
160	N/A	N/A	3789	3612	4115	3890
180	N/A	N/A	3979	3788	4345	4096
200	N/A	N/A	4418	4192	4555	4287
220	N/A	N/A	4435	4204	N/A	N/A
250	N/A	N/A	4510	4256	N/A	N/A

Note: All weights +/-3%.
Weights include optional base rail fork lifting, subtract 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 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 IP-22 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 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 25.4 mm diameter on standard efficiency chillers and 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 Chinese code. The evaporator is designed for refrigerant-side/working-side pressure of 13.8 bars.

All water pass arrangements are available with flanged connections with 10.5 bars waterside working pressure. Waterside shall be hydrostatically tested at 15.5 bars.

Condenser

Dual circuited, shell and tube condenser designed with seamless internally/externally finned tubes expanded into tubesheets and mechanically fastened to tube supports. Condenser tubes are 25.4 mm diameter on standard efficiency chillers and19.05 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 Chinese code. The condenser is designed for refrigerant-side/working-side pressure of 20.7 bars.

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

Standard temperature condenser allow for leaving condenser water temperature up to 40.6°C and for entering condenser water temperatures up to 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, liquid line shut off valve, removable core filter, charging port 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.

Oil Management

The RTWD 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, 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, operator settings, service settings, service tests, and diagnostics. All diagnostics and messages are displayed in clear uncoded 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)
- 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.

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.

High-Temperature Condenser

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

Insulation

The evaporator, water boxes, and motor housing are covered with factory installed 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 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 -12.2°C.

Nitrogen Charge

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

Performance Tests

Performance tests are available to certify chiller performance before shipment.

220 V power88.9 mm and 114.3 mm**Water-to-Water Heat Pump**

Optimized compressors, oil cooler and high condenser temperature control panel allows for leaving condenser water temperatures up to 60°C. This option allows for entering condenser water temperatures above 35°C Condenser leaving water temperature control option is required; the setpoint range is60°C.

Electrical Options:

Across-the-Line Starter

Across-the-line starter is unit mounted with a IP-22 gasketed enclosure.

Wye-Delta Starter

This option provides a reduced-inrush, unit mounted starter with a IP-22 gasketed enclosure.

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.

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.

Control Options:

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 26.7°C to 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 Pressure (%HPC) Output

Provides a 2—10 Vdc output that is a function of percent high pressure cutout for condenser pressure. The percent high pressure cutout for condenser pressure indication output is based on the condenser refrigerant pressure transducer(s).

Condenser Water Control Output

Provides a highly configured signal designed to control a Trane supplied 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 0–10 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.

Options

Literature Order Number	RLC-PRC030-EN
Date	June 2009
Supersedes	RLC-PRC030-EN (January 2008)

www.trane.com

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