TRANE®

Product Catalog

Series R™ Helical Rotary Water-Cooled Liquid Chillers

Model RTWD

75–250 Tons - 60 Hz

September 2009

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Introduction

To meet a wide range of applications in the 75–250 ton 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 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.
- 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.

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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 ±0.5°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 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 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™ 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 ±1°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.
- 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 55°F (12.8°C), or between 45°F (7.2°C) and 55°F (12.8°C), when a temperature increase of 1°F (0.56°C) per minute to 55°F (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 25 psid (1.7 bars) at all load conditions in order to ensure adequate oil circulation. Condenser leaving water temperature must be 17°F (9.5°C) higher than evaporator leaving water temperature within 2 minutes of startup. A 25°F (13.9°C) temperature difference must be maintained thereafter [this differential requirement is lessened by 0.25°F (0.14°C) for every 1°F (0.56°C) that the condenser leaving water temperature is above 55°F (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 +/-0.5°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 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 +/-0.5°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.

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 1750-rpm (60 Hz) pumps. Specifying or using 3600-rpm (60 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 3600-rpm (60 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 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

B = 230/60/3
D = 380/60/3
F = 460/60/3

Digit 09 – Manufacturing Plant

1 = Epinal, France
2 = Pueblo, USA
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

1 = ASME Pressure Vessel Code
4 = Chinese Code-China Built 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 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 = 150 psi/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 = 150 psi/10.5 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
G = Chinese - Traditional

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 – 60 Hz – standard efficiency

Size		80	90	100	110	120	130	140
Compressor								
Quantity		2	2	2	2	2	2	2
Evaporator								
Water Storage	(gal)	11.2	11.2	12.6	14	15.2	16.2	17.7
	(L)	42.2	42.2	47.6	53.0	57.4	61.5	66.8
2 Pass Arrangement								
Water Conn. Size	NPS	4	4	4	4	5	5	5
	mm	100	100	100	100	125	125	125
Minimum Flow	(gpm)	77	77	89	101	101	110	122
	(L/s)	4.9	4.9	5.6	6.4	6.4	6.9	7.7
Maximum Flow	(gpm)	281	281	325	368	368	400	444
	(L/s)	17.7	17.7	20.5	23.2	23.2	25.2	28
3 Pass Arrangement								
Water Conn. Size	NPS	3	3	3	3	4	4	4
	mm	80	80	80	80	100	100	100
Minimum Flow	(gpm)	52	52	59	67	67	73	81
	(L/s)	3.3	3.3	3.8	4.3	4.3	4.6	5.1
Maximum Flow	(gpm)	187	187	216	244	244	266	295
	(L/s)	11.8	11.8	13.6	15.4	15.4	16.8	18.6
Condenser								
Water Storage	(gal)	12.4	14.2	16.0	16.9	18.5	18.5	20.9
	(L)	46.8	53.6	60.4	63.8	70.1	70.1	79.2
Water Conn. Size	NPS	5	5	5	5	5	5	5
	mm	125	125	125	125	125	125	125
Minimum Flow	(gpm)	83	99	115	124	135	135	156
	(L/s)	5.2	6.3	7.3	7.8	8.5	8.5	9.9
Maximum Flow	(gpm)	301	361	421	451	491	491	572
	(L/s)	18.9	22.7	26.5	28.4	31.0	31.0	36.0
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	(lb)	114.6/114.6	114.6/114.6	112.4/114.6	112.4/112.4	132.3/132.3	130.1/130.1	127.9/132.3
	(kg)	52/52	52/52	51/52	51/51	60/60	59/59	58/60
Oil Charge	(qt)	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
	(L)	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

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 – 60 Hz – high efficiency

Size		80	90	100	110	120	130
Compressor							
Quantity		2	2	2	2	2	2
Evaporator							
Water Storage	(gal)	9.8	11.9	12.8	15.3	16.4	17.3
	(L)	37.0	45.2	48.3	57.9	62.3	65.4
2 Pass Arrangement							
Water Conn. Size	NPS	4	4	4	5	5	5
	mm	100	100	100	125	125	125
Minimum Flow	(gpm)	72	92	100	112	123	130
	(L/s)	4.6	5.8	6.3	7.1	7.8	8.2
Maximum Flow	(gpm)	263	336	364	409	448	476
	(L/s)	16.6	21.2	22.9	25.8	28.2	30.0
3 Pass Arrangement							
Water Conn. Size	NPS	3	3	3	4	4	4
	mm	80	80	80	100	100	100
Minimum Flow	(gpm)	48	61	67	75	82	87
	(L/s)	3.1	3.9	4.2	4.7	5.2	5.5
Maximum Flow	(gpm)	175	223	242	271	298	316
	(L/s)	11.0	14.1	15.2	17.1	18.8	19.9
Condenser							
Water Storage	(gal)	11.9	12.7	14.9	16.6	17.2	18.0
	(L)	45.1	48.1	56.3	62.7	65.2	68.3
Water Conn. Size	NPS	5	5	5	5	5	5
	mm	125	125	125	125	125	125
Minimum Flow	(gpm)	87	95	117	130	136	145
	(L/s)	5.5	6.0	7.4	8.2	8.6	9.1
Maximum Flow	(gpm)	317	347	427	473	498	528
	(L/s)	20.0	21.9	26.9	29.8	31.4	33.3
General Unit							
Refrigerant Type		R-134a	R-134a	R-134a	R-134a	R-134a	R-134a
# Refrig Circuits		2	2	2	2	2	2
Refrigerant Charge	(lb)	99.2/99.2	97/97	123.5/125.7	123.5/123.5	121.3/121.3	119/119
	(kg)	45/45	44/44	56/57	56/56	55/55	54/54
Oil Charge	(qt)	7.2/7.2	7.2/7.2	7.2/10.5	10.5/10.5	10.5/10.5	10.5/10.5
	(L)	6.8/6.8	6.8/6.8	6.8/9.9	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 3. General Data – 60 Hz – high efficiency (continued)

Size		150	160	180	200	220	250
Compressor							
Quantity		2	2	2	2	2	2
Evaporator							
Water Storage	(gal)	18.8	20.0	22.0	23.8	27.9	31.0
	(L)	71.2	75.6	83.2	90.1	105.5	117.5
2 Pass Arrangement							
Water Conn. Size	NPS	5	5	5	5	6	6
	mm	125	125	125	125	150	150
Minimum Flow	(gpm)	141	151	170	186	211	240
	(L/s)	8.9	9.5	10.7	11.8	13.3	15.1
Maximum Flow	(gpm)	515	555	622	683	773	879
	(L/s)	32.5	35.0	39.2	43.1	48.8	55.5
3 Pass Arrangement							
Water Conn. Size	NPS	4	4	4	4	4	4
	mm	100	100	100	100	100	100
Minimum Flow	(gpm)	94	101	113	124	141	160
	(L/s)	5.9	6.4	7.1	7.8	8.9	10.1
Maximum Flow	(gpm)	344	370	415	456	515	586
	(L/s)	21.67	23.3	26.2	28.7	32.5	37.0
Condenser							
Water Storage	(gal)	21.6	22.9	24.6	26.2	31.1	39.2
	(L)	81.7	86.8	93.0	99.2	117.8	148.3
Water Conn. Size	NPS	6	6	6	6	6	6
	mm	150	150	150	150	150	150
Minimum Flow	(gpm)	159	173	189	206	244	325
	(L/s)	10.1	10.9	12.0	13.0	15.4	20.5
Maximum Flow	(gpm)	584	634	695	755	896	1193
	(L/s)	36.8	40.0	43.8	47.6	56.5	75.3
General Unit							
Refrigerant Type		R-134a	R-134a	R-134a	R-134a	R-134a	R-134a
# Refrig Circuits		2	2	2	2	2	2
Refrigerant Charge	(lb)	134.5/143.3	141.1/141.1	138.9/138.9	136.7/136.7	178.6/185.2	180.8/180.8
	(kg)	61/65	64/64	63/63	62/62	81/84	82/82
Oil Charge	(qt)	10.5/12.4	12.4/12.4	12.4/12.4	12.4/12.4	12.4/12.4	12.4/12.4
	(L)	9.9/11.7	11.7/11.7	11.7/11.7	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 – 60 Hz – premium efficiency

Size		150	160	180	200
Compressor					
Quantity		2	2	2	2
Water Storage	(gal)	27.1	27.1	28.6	30.6
	(L)	102.4	102.4	108.3	115.7
Evaporator					
2 Pass Arrangement					
Water Conn. Size	NPS	6	6	6	6
	mm	150	150	150	150
Minimum Flow	(gpm)	174	174	186	202
	(L/s)	11.0	11.0	11.8	12.7
Maximum Flow	(gpm)	639	639	383	739
	(L/s)	40.3	40.3	43.1	46.7
3 Pass Arrangement					
Water Conn. Size	NPS	4	4	4	4
	mm	100	100	100	100
Minimum Flow	(gpm)	116	116	124	134
	(L/s)	7.3	7.3	7.8	8.5
Maximum Flow	(gpm)	426	426	456	493
	(L/s)	26.9	26.9	28.7	31.1
Condenser					
Water Storage	(gal)	30.0	30.0	32.9	32.9
	(L)	113.4	113.4	124.4	124.4
Water Conn. Size	NPS	6	6	6	6
	mm	150	150	150	150
Minimum Flow	(gpm)	206	206	231	231
	(L/s)	13.0	13.0	14.6	14.6
Maximum Flow	(gpm)	755	755	845	845
	(L/s)	47.6	47.6	53.3	53.3
General Unit					
Refrigerant Type		R-134a	R-134a	R-134a	R-134a
# Refrig Circuits		2	2	2	2
Refrigerant Charge	(lb)	174.2/183.0	183.0/183.0	180.8/180.8	178.6/178.6
	(kg)	79/83	83/83	82/82	81/81
Oil Charge	(qt)	10.5/12.4	12.4/12.4	12.4/12.4	12.4/12.4
	(L)	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.

Performance Data

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

Evaporator Leaving Water Temp (°F)	Unit Size	Condenser Entering Water Temperature (°F)											
		75				85				95			
		Tons	kW Input	EER	kW/ton	Tons	kW Input	EER	kW/ton	Tons	kW Input	EER	kW/ton
40	80	75.6	49.6	18.2	0.661	70.8	56.0	15.1	0.796	65.7	63.4	12.4	0.971
	90	86.4	56.5	18.2	0.659	81.3	63.7	15.2	0.789	75.9	72.2	12.6	0.956
	100	98.8	65.1	18.1	0.663	93.0	73.8	15.0	0.798	86.7	83.9	12.3	0.973
	110	112.0	73.8	18.1	0.662	105.2	83.8	15.0	0.800	98.1	95.6	12.3	0.979
	120	122.7	79.6	18.4	0.652	115.3	90.2	15.3	0.786	107.5	102.7	12.5	0.959
	130	130.5	85.0	18.3	0.654	122.7	96.3	15.2	0.788	114.4	109.5	12.5	0.960
	140	142.5	93.3	18.2	0.658	134.0	105.5	15.2	0.790	125.1	119.8	12.5	0.961
42	80	78.7	49.9	18.8	0.640	73.8	56.2	15.6	0.768	68.5	63.6	12.8	0.935
	90	89.7	56.9	18.8	0.639	84.6	64.0	15.7	0.762	79.0	72.4	13.0	0.921
	100	102.7	65.5	18.7	0.642	96.7	74.1	15.6	0.770	90.3	84.1	12.8	0.936
	110	116.3	74.2	18.7	0.641	109.4	84.2	15.5	0.773	102.1	95.9	12.7	0.943
	120	127.6	80.1	19.0	0.631	120.0	90.6	15.8	0.758	112.0	103.0	13.0	0.923
	130	135.7	85.5	19.0	0.633	127.7	96.7	15.8	0.761	119.2	109.8	13.0	0.924
	140	148.2	93.9	18.9	0.636	139.5	106.0	15.7	0.763	130.3	120.1	13.0	0.925
44	80	81.8	50.3	19.4	0.620	76.7	56.6	16.2	0.742	71.3	63.8	13.3	0.901
	90	93.2	57.3	19.4	0.620	87.9	64.4	16.3	0.737	82.2	72.6	13.5	0.888
	100	106.6	66.0	19.3	0.622	100.5	74.4	16.1	0.745	93.9	84.3	13.3	0.902
	110	120.8	74.7	19.3	0.621	113.7	84.5	16.1	0.747	106.3	96.1	13.2	0.908
	120	132.6	80.6	19.6	0.611	124.9	91.1	16.4	0.733	116.6	103.4	13.5	0.890
	130	141.0	86.1	19.6	0.614	132.8	97.2	16.3	0.735	124.2	110.2	13.5	0.891
	140	154.1	94.6	19.5	0.616	145.2	106.6	16.3	0.737	135.7	120.5	13.5	0.891

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

Evaporator Leaving Water Temp (°F)	Unit Size	Condenser Entering Water Temperature (°F)											
		75				85				95			
		Tons	kW Input	EER	kW/ton	Tons	kW Input	EER	kW/ton	Tons	kW Input	EER	kW/ton
46	80	85.0	50.7	20.0	0.601	79.8	56.9	16.7	0.718	74.2	64.1	13.8	0.869
	90	96.7	57.8	19.9	0.602	91.2	64.7	16.8	0.714	85.4	72.8	14.0	0.857
	100	110.7	66.4	19.9	0.604	104.4	74.8	16.7	0.721	97.6	84.6	13.8	0.871
	110	125.3	75.2	19.9	0.603	118.1	84.9	16.6	0.722	110.5	96.5	13.7	0.876
	120	137.7	81.2	20.2	0.593	129.8	91.6	16.9	0.709	121.4	103.8	14.0	0.858
	130	146.5	86.8	20.2	0.595	138.1	97.8	16.9	0.711	129.2	110.6	14.0	0.860
	140	160.1	95.3	20.1	0.598	150.9	107.2	16.8	0.713	141.2	120.9	14.0	0.859
48	80	88.2	51.1	20.6	0.584	82.9	57.2	17.3	0.695	77.2	64.4	14.3	0.839
	90	100.3	58.3	20.5	0.585	94.7	65.1	17.3	0.692	88.8	73.1	14.5	0.828
	100	114.8	66.9	20.5	0.587	108.3	75.2	17.2	0.698	101.5	85.0	14.3	0.841
	110	130.0	75.7	20.5	0.585	122.6	85.4	17.2	0.700	114.8	96.8	14.2	0.846
	120	143.0	81.9	20.8	0.576	134.8	92.2	17.5	0.687	126.3	104.2	14.5	0.829
	130	152.0	87.5	20.8	0.578	143.4	98.4	17.4	0.689	134.4	111.2	14.5	0.830
	140	166.2	96.1	20.7	0.580	156.8	107.8	17.4	0.690	146.8	121.4	14.5	0.830
50	80	91.5	51.5	21.1	0.568	86.1	57.6	17.8	0.674	80.3	64.7	14.8	0.811
	90	104.0	58.8	21.1	0.569	98.3	65.6	17.9	0.672	92.2	73.5	15.0	0.802
	100	119.0	67.5	21.0	0.570	112.4	75.7	17.7	0.677	105.4	85.3	14.8	0.813
	110	134.7	76.3	21.1	0.569	127.2	85.9	17.7	0.678	119.3	97.2	14.7	0.818
	120	148.3	82.6	21.4	0.560	140.0	92.8	18.0	0.666	131.2	104.7	15.0	0.801
	130	157.8	88.3	21.3	0.562	149.0	99.1	18.0	0.668	139.6	111.7	14.9	0.803
	140	172.5	96.9	21.3	0.564	162.9	108.5	17.9	0.669	152.6	122.0	15.0	0.802

1. Rated in accordance with ARI Standard 550/590, based on evaporator temperature drop of 10°F, 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.
5. EER – Energy Efficiency Ratio (Btu/W·h). Power inputs include compressors and control power.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Table 6. Performance Data - 60 Hz - high efficiency - I-P units

Evaporator Leaving Water Temp (°F)	Unit Size	Condenser Entering Water Temperature (°F)											
		75				85				95			
		Tons	kW input	EER	kW/ton	Tons	kW input	EER	kW/ton	Tons	kW input	EER	kW/ton
38	80	77.1	48.5	18.9	0.634	72.2	54.7	15.7	0.763	66.9	61.9	12.9	0.931
	90	89.9	56.0	19.1	0.627	84.5	63.0	16.0	0.750	78.7	71.2	13.2	0.910
	100	103.5	64.1	19.2	0.624	97.1	72.5	16.0	0.750	90.4	82.3	13.1	0.915
	110	117.3	72.3	19.4	0.620	110.0	82.0	16.0	0.749	102.3	93.4	13.1	0.917
	120	124.9	77.1	19.3	0.621	117.2	87.4	16.0	0.749	109.1	99.5	13.1	0.916
	130	132.6	81.7	19.4	0.619	124.6	92.5	16.1	0.746	116.1	105.3	13.2	0.911
	150	144.6	90.3	19.1	0.628	135.9	102.3	15.9	0.756	126.8	116.3	13.0	0.921
	160	157.7	98.3	19.2	0.626	148.4	111.2	16.0	0.752	138.4	126.4	13.1	0.916
	180	172.1	106.1	19.4	0.619	162.0	119.7	16.2	0.741	151.4	135.8	13.3	0.900
	200	187.0	113.8	19.7	0.610	176.3	128.1	16.5	0.729	165.0	145.1	13.6	0.882
	220	204.7	128.5	19.1	0.630	193.0	144.9	15.9	0.753	180.7	164.2	13.2	0.911
	250	225.0	141.5	19.0	0.631	212.0	159.6	15.9	0.754	198.4	180.8	13.1	0.913
40	80	80.3	48.8	19.6	0.613	75.3	54.9	16.3	0.735	69.8	62.1	13.4	0.895
	90	93.6	56.4	19.8	0.607	88.0	63.3	16.6	0.724	82.0	71.4	13.7	0.875
	100	107.8	64.5	19.9	0.603	101.2	72.8	16.6	0.723	94.3	82.5	13.7	0.879
	110	122.1	72.7	20.0	0.599	114.7	82.3	16.6	0.721	106.8	93.6	13.6	0.880
	120	130.0	77.5	20.0	0.599	122.2	87.7	16.6	0.721	113.9	99.7	13.7	0.879
	130	138.1	82.1	20.1	0.598	129.9	92.8	16.7	0.718	121.1	105.5	13.7	0.874
	150	150.5	90.8	19.8	0.606	141.6	102.6	16.5	0.727	132.2	116.5	13.6	0.884
	160	164.2	98.8	19.9	0.604	154.6	111.6	16.6	0.724	144.4	126.6	13.6	0.879
	180	179.1	106.7	20.1	0.598	168.8	120.2	16.8	0.714	157.9	136.1	13.9	0.865
	200	194.6	114.5	20.3	0.590	183.6	128.7	17.1	0.703	172.0	145.5	14.1	0.848
	220	213.0	129.3	19.7	0.609	201.0	145.5	16.5	0.726	188.4	164.6	13.7	0.876
	250	234.2	142.4	19.7	0.610	220.9	160.2	16.5	0.727	206.9	181.2	13.7	0.878
42	80	83.5	49.1	20.2	0.593	78.4	55.2	16.9	0.709	72.8	62.3	13.9	0.861
	90	97.3	56.9	20.4	0.588	91.6	63.7	17.2	0.699	85.5	71.6	14.2	0.842
	100	112.1	65.0	20.6	0.583	105.4	73.1	17.2	0.697	98.3	82.7	14.2	0.845
	110	127.0	73.2	20.7	0.580	119.4	82.6	17.3	0.695	111.4	93.8	14.2	0.846
	120	135.3	78.0	20.7	0.580	127.2	88.0	17.3	0.695	118.7	99.9	14.2	0.845
	130	143.7	82.6	20.8	0.578	135.3	93.2	17.3	0.692	126.3	105.7	14.3	0.840
	150	156.6	91.3	20.5	0.586	147.5	103.0	17.1	0.701	137.8	116.7	14.1	0.850
	160	170.8	99.4	20.5	0.584	161.0	112.0	17.2	0.698	150.5	126.8	14.2	0.845
	180	186.3	107.4	20.7	0.578	175.8	120.7	17.4	0.689	164.5	136.5	14.4	0.832
	200	202.4	115.3	21.0	0.572	191.1	129.3	17.7	0.679	179.2	146.0	14.7	0.817
	220	221.5	130.2	20.3	0.590	209.2	146.2	17.1	0.701	196.3	165.1	14.2	0.843
	250	243.6	143.4	20.3	0.590	230.0	160.9	17.1	0.702	215.6	181.7	14.2	0.845

Table 6. Performance Data - 60 Hz - high efficiency - I-P units

Evaporator Leaving Water Temp (°F)	Unit Size	Condenser Entering Water Temperature (°F)											
		75				85				95			
		Tons	kW input	EER	kW/ton	Tons	kW input	EER	kW/ton	Tons	kW input	EER	kW/ton
44	80	86.9	49.5	20.9	0.574	81.6	55.5	17.5	0.685	75.9	62.5	14.5	0.829
	90	101.2	57.3	21.0	0.571	95.3	64.0	17.7	0.676	89.1	71.9	14.8	0.812
	100	116.6	65.5	21.2	0.565	109.8	73.5	17.8	0.673	102.5	83.0	14.8	0.813
	110	132.1	73.7	21.4	0.561	124.3	83.0	17.9	0.671	116.1	94.1	14.7	0.814
	120	140.7	78.5	21.4	0.561	132.5	88.4	17.9	0.671	123.8	100.2	14.8	0.813
	130	149.4	83.2	21.5	0.559	140.8	93.6	18.0	0.668	131.6	106.0	14.9	0.808
	150	162.8	91.9	21.2	0.567	153.5	103.4	17.7	0.677	143.6	117.0	14.7	0.818
	160	177.6	100.0	21.2	0.565	167.6	112.5	17.8	0.674	156.7	127.1	14.8	0.813
	180	193.7	108.1	21.4	0.560	182.9	121.3	18.0	0.665	171.4	136.9	15.0	0.801
	200	210.4	116.2	21.6	0.554	198.8	130.0	18.3	0.656	186.6	146.6	15.2	0.788
	220	230.2	131.2	21.0	0.572	217.6	147.0	17.7	0.677	204.3	165.7	14.8	0.813
	250	253.2	144.4	21.0	0.572	239.2	161.8	17.7	0.678	224.5	182.3	14.8	0.814
46	80	90.3	49.9	21.5	0.557	84.8	55.8	18.1	0.662	79.0	62.7	15.0	0.799
	90	105.2	57.9	21.7	0.554	99.1	64.5	18.3	0.654	92.7	72.2	15.3	0.783
	100	121.2	66.0	21.9	0.548	114.2	73.9	18.4	0.651	106.7	83.3	15.3	0.784
	110	137.2	74.3	22.1	0.544	129.3	83.5	18.5	0.649	120.9	94.4	15.3	0.785
	120	146.2	79.1	22.1	0.544	137.8	88.9	18.5	0.648	128.9	100.5	15.3	0.783
	130	155.3	83.8	22.1	0.542	146.5	94.1	18.6	0.645	137.1	106.3	15.4	0.778
	150	169.1	92.5	21.8	0.549	159.6	103.9	18.4	0.654	149.5	117.3	15.2	0.788
	160	184.5	100.6	21.9	0.548	174.3	113.0	18.4	0.651	163.1	127.4	15.3	0.783
	180	201.2	108.9	22.1	0.543	190.2	121.9	18.7	0.643	178.4	137.4	15.5	0.772
	200	218.6	117.2	22.3	0.538	206.7	130.8	18.9	0.635	194.2	147.2	15.8	0.760
	220	239.0	132.2	21.6	0.555	226.1	147.8	18.3	0.655	212.5	166.3	15.3	0.784
	250	263.1	145.5	21.6	0.555	248.8	162.6	18.3	0.655	233.7	182.9	15.3	0.784

Table 6. Performance Data - 60 Hz - high efficiency - I-P units

Evaporator Leaving Water Temp (°F)	Unit Size	Condenser Entering Water Temperature (°F)											
		75				85				95			
		Tons	kW input	EER	kW/ton	Tons	kW input	EER	kW/ton	Tons	kW input	EER	kW/ton
48	80	93.7	50.3	22.2	0.541	88.2	56.1	18.7	0.641	82.2	63.0	15.6	0.771
	90	109.2	58.4	22.3	0.538	103.0	64.9	18.9	0.634	96.4	72.5	15.9	0.756
	100	125.9	66.5	22.6	0.532	118.7	74.4	19.0	0.630	111.1	83.6	15.9	0.756
	110	142.5	74.8	22.7	0.528	134.4	83.9	19.1	0.628	125.8	94.8	15.9	0.757
	120	151.8	79.7	22.7	0.528	143.3	89.4	19.1	0.627	134.2	100.9	15.9	0.755
	130	161.4	84.4	22.8	0.526	152.3	94.6	19.2	0.624	142.7	106.7	16.0	0.750
	150	175.6	93.2	22.5	0.533	165.9	104.5	19.0	0.632	155.5	117.7	15.8	0.759
	160	191.5	101.3	22.6	0.531	181.1	113.5	19.1	0.629	169.7	127.8	15.9	0.755
	180	208.9	109.7	22.8	0.527	197.6	122.6	19.3	0.623	185.5	137.9	16.1	0.745
	200	226.9	118.2	23.0	0.523	214.8	131.7	19.5	0.615	201.9	147.8	16.3	0.734
	220	248.1	133.3	22.3	0.539	234.9	148.7	18.9	0.635	221.0	167.0	15.8	0.758
	250	273.2	146.8	22.3	0.539	258.5	163.6	18.9	0.635	243.0	183.6	15.8	0.757
50	80	97.3	50.7	22.8	0.525	91.6	56.5	19.3	0.621	85.5	63.3	16.1	0.744
	90	113.3	59.0	22.9	0.524	107.0	65.4	19.5	0.615	100.3	72.9	16.4	0.731
	100	130.6	67.1	23.2	0.517	123.3	74.9	19.7	0.610	115.6	84.0	16.4	0.730
	110	147.8	75.5	23.4	0.513	139.6	84.5	19.7	0.608	130.9	95.2	16.4	0.731
	120	157.6	80.4	23.4	0.512	148.9	89.9	19.8	0.607	139.6	101.3	16.5	0.729
	130	167.6	85.1	23.5	0.510	158.3	95.2	19.9	0.604	148.4	107.1	16.6	0.724
	150	182.2	93.9	23.2	0.517	172.4	105.0	19.6	0.612	161.7	118.1	16.4	0.733
	160	198.7	102.0	23.3	0.515	188.1	114.1	19.7	0.609	176.4	128.2	16.5	0.729
	180	216.8	110.6	23.4	0.512	205.3	123.4	19.9	0.603	192.9	138.5	16.7	0.720
	200	235.5	119.3	23.6	0.508	223.1	132.6	20.1	0.596	209.9	148.6	16.9	0.710
	220	257.3	134.5	22.9	0.524	243.8	149.7	19.5	0.615	229.6	167.8	16.4	0.732
	250	283.5	148.0	22.9	0.524	268.4	164.6	19.5	0.615	252.6	184.4	16.4	0.732

1. Rated in accordance with ARI Standard 550/590, based on evaporator temperature drop of 10°F, 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.
5. EER – Energy Efficiency Ratio (Btu/W·h). Power inputs include compressors and control power.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Table 7. Performance Data - premium efficiency - 60 Hz - I-P units

Evaporator Leaving Water Temp (°F)	Unit Size	Condenser Entering Water Temperature (°F)											
		75				85				95			
		Tons	kW input	EER	kW/ton	Tons	kW input	EER	kW/ton	Tons	kW input	EER	kW/ton
38	150	149.9	88.3	20.3	0.592	140.7	99.9	16.8	0.713	131.0	113.5	13.8	0.870
	160	163.7	96.5	20.3	0.592	153.8	109.1	16.9	0.712	143.3	123.8	13.8	0.867
	180	178.0	104.2	20.4	0.588	167.4	117.4	17.1	0.704	156.2	133.1	14.0	0.854
	200	193.1	112.3	20.6	0.583	181.9	126.2	17.2	0.696	170.0	142.8	14.2	0.842
40	150	156.3	88.8	21.0	0.571	146.9	100.2	17.5	0.685	136.9	113.7	14.4	0.833
	160	170.6	97.1	21.0	0.571	160.5	109.4	17.5	0.684	149.6	124.0	14.4	0.831
	180	185.5	104.8	21.2	0.567	174.6	117.8	17.7	0.677	163.1	133.3	14.6	0.820
	200	201.2	113.1	21.3	0.564	189.6	126.8	17.9	0.671	177.5	143.2	14.8	0.809
42	150	162.9	89.4	21.8	0.551	153.3	100.6	18.2	0.659	143.0	113.9	15.0	0.799
	160	177.7	97.6	21.8	0.552	167.4	109.8	18.2	0.659	156.2	124.2	15.0	0.798
	180	193.1	105.5	21.9	0.548	182.1	118.3	18.4	0.652	170.2	133.7	15.2	0.787
	200	209.5	113.9	22.0	0.546	197.6	127.4	18.6	0.647	185.1	143.7	15.4	0.778
44	150	169.6	89.9	22.5	0.533	159.8	101.0	18.9	0.635	149.2	114.1	15.6	0.768
	160	185.0	98.2	22.5	0.533	174.4	110.3	18.9	0.635	162.9	124.4	15.7	0.766
	180	201.0	106.2	22.6	0.530	189.7	118.9	19.1	0.629	177.5	134.0	15.8	0.757
	200	218.1	114.8	22.7	0.528	205.8	128.2	19.2	0.625	193.0	144.2	16.0	0.749
46	150	176.5	90.6	23.3	0.515	166.4	101.5	19.6	0.612	155.6	114.4	16.3	0.738
	160	192.4	98.9	23.3	0.516	181.6	110.8	19.6	0.612	169.8	124.8	16.3	0.737
	180	209.1	107.0	23.4	0.514	197.5	119.6	19.8	0.607	185.0	134.5	16.5	0.729
	200	226.9	115.9	23.4	0.512	214.3	129.0	19.9	0.604	201.1	144.8	16.6	0.722
48	150	183.6	91.2	24.0	0.499	173.3	102.0	20.3	0.591	162.2	114.8	16.9	0.710
	160	200.0	99.6	24.0	0.500	189.0	111.3	20.3	0.591	176.9	125.1	16.9	0.709
	180	217.4	107.9	24.1	0.498	205.5	120.3	20.4	0.587	192.7	135.0	17.1	0.703
	200	235.9	116.9	24.1	0.498	223.0	129.9	20.5	0.584	209.4	145.5	17.2	0.697
50	150	190.8	92.0	24.8	0.484	180.3	102.6	21.0	0.571	168.9	115.2	17.5	0.684
	160	207.7	100.3	24.8	0.485	196.6	111.9	21.0	0.571	184.2	125.6	17.6	0.684
	180	225.8	108.8	24.8	0.484	213.7	121.0	21.1	0.568	200.6	135.6	17.7	0.678
	200	245.1	118.1	24.8	0.483	231.9	130.8	21.2	0.566	217.9	146.3	17.8	0.673

1. Rated in accordance with ARI Standard 550/590, based on evaporator temperature drop of 10°F, 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.
5. EER – Energy Efficiency Ratio (Btu/W·h). Power inputs include compressors and control power.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Table 8. Part Load Performance – 60 Hz – standard efficiency – I-P units

						IPLV	
Unit Size	**% Load**	**Tons**	**kW**	**EER**	**kW/ton**	**EER**	**kW/ton**
80	100	76.7	57.0	16.2	0.742	21.6	0.557
	75	57.5	35.2	19.6	0.611		
	50	38.4	19.3	23.9	0.502		
	25	19.2	11.6	19.9	0.602		
90	100	87.9	64.8	16.3	0.737	21.5	0.558
	75	65.9	39.7	19.9	0.603		
	50	43.9	22.3	23.7	0.508		
	25	22.0	13.4	19.7	0.609		
100	100	100.5	74.8	16.1	0.745	21.6	0.554
	75	75.3	46.4	19.5	0.615		
	50	50.2	25.6	23.6	0.509		
	25	25.1	16.7	18.0	0.538		
110	100	113.8	84.9	16.1	0.747	21.3	0.563
	75	85.3	53.0	19.3	0.622		
	50	56.9	28.7	23.8	0.505		
	25	28.4	17.3	19.7	0.609		
120	100	124.8	91.5	16.4	0.733	21.8	0.551
	75	93.6	57.5	19.5	0.614		
	50	62.4	31.1	24.1	0.498		
	25	31.2	17.6	21.3	0.563		
130	100	132.8	97.6	16.3	0.735	21.3	0.564
	75	99.6	61.5	19.4	0.618		
	50	66.4	33.6	23.7	0.506		
	25	33.2	20.9	19.1	0.630		
140	100	145.2	107.0	16.3	0.737	21.5	0.558
	75	108.9	68.6	19.0	0.630		
	50	72.6	36.1	24.1	0.497		
	25	36.3	20.9	20.8	0.576		

1. Rated in accordance with ARI Standard 550/590, based on evaporator temperature drop of 10°F, 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.
5. EER – Energy Efficiency Ratio (Btu/W·h). Power inputs include compressors and control power.

Table 9. Part Load Performance – 60 Hz – high efficiency – I-P units

						IPLV	
Unit Size	**% Load**	**Tons**	**kW**	**EER**	**kW/ton**	**EER**	**kW/ton**
80	100	81.6	55.9	17.5	0.685	23.3	0.515
	75	61.2	34.5	21.3	0.563		
	50	40.8	19.0	25.8	0.465		
	25	20.4	11.5	21.3	0.562		
90	100	95.3	64.4	17.8	0.676	23.5	0.511
	75	71.5	39.5	21.7	0.552		
	50	47.7	22.2	25.8	0.466		
	25	23.8	13.2	22.0	0.555		
100	100	109.8	73.9	17.8	0.673	24.1	0.497
	75	82.3	45.7	21.6	0.556		
	50	54.9	24.9	26.5	0.453		
	25	27.4	13.3	24.7	0.483		
110	100	124.3	83.4	17.9	0.671	23.7	0.506
	75	93.2	52.1	21.5	0.559		
	50	62.2	28.3	26.4	0.455		
	25	31.1	17.0	22.0	0.548		
120	100	132.5	88.8	17.9	0.671	23.6	0.508
	75	99.3	55.9	21.3	0.563		
	50	66.2	30.5	26.0	0.460		
	25	33.1	17.2	23.1	0.520		
130	100	140.8	94.0	18.0	0.668	23.4	0.514
	75	105.6	59.4	21.4	0.562		
	50	70.4	32.4	26.0	0.461		
	25	35.2	20.3	20.8	0.576		
150	100	153.5	103.8	17.7	0.677	23.1	0.519
	75	115.1	66.7	20.7	0.580		
	50	76.8	35.9	25.7	0.468		
	25	38.4	20.4	22.6	0.533		
160	100	167.6	112.9	17.8	0.674	22.9	0.523
	75	125.7	73.0	20.7	0.580		
	50	83.8	38.8	25.9	0.463		
	25	41.9	24.9	20.2	0.594		
180	100	182.9	121.7	18.0	0.666	23.5	0.511
	75	137.2	78.1	21.1	0.569		
	50	91.4	41.7	26.3	0.456		
	25	45.7	25.2	21.8	0.551		

Table 9. Part Load Performance – 60 Hz – high efficiency – I-P units

						IPLV	
Unit Size	**% Load**	**Tons**	**kW**	**EER**	**kW/ton**	**EER**	**kW/ton**
200	100	198.8	130.4	18.3	0.656	23.5	0.511
	75	149.1	83.2	21.5	0.558		
	50	99.4	45.8	26.0	0.460		
	25	49.7	28.4	21.0	0.571		
220	100	217.6	147.4	17.7	0.677	22.8	0.527
	75	163.2	95.0	20.6	0.582		
	50	108.8	52.5	24.9	0.483		
	25	54.4	28.6	22.8	0.526		
250	100	239.3	162.2	17.7	0.678	22.6	0.531
	75	179.4	106.1	20.3	0.591		
	50	119.6	56.2	25.5	0.470		
	25	59.8	35.9	20.0	0.599		

1. Rated in accordance with ARI Standard 550/590, based on evaporator temperature drop of 10°F, 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.
5. EER – Energy Efficiency Ratio (Btu/W·h). Power inputs include compressors and control power.

Table 10. Part Load Performance – 60 Hz – premium efficiency – I-P units

						IPLV	
Unit Size	**% Load**	**Tons**	**kW**	**EER**	**kW/ton**	**EER**	**kW/ton**
150	100	159.8	101.4	18.9	0.635	24.8	0.483
	75	119.8	65.1	22.1	0.543		
	50	79.9	34.4	27.9	0.430		
	25	39.9	20.3	23.6	0.509		
160	100	174.4	110.7	18.9	0.635	24.4	0.492
	75	130.8	71.5	22.0	0.547		
	50	87.2	37.9	27.6	0.434		
	25	43.6	24.7	21.2	0.566		
180	100	189.7	119.3	19.1	0.629	24.9	0.482
	75	142.3	76.5	22.3	0.538		
	50	94.8	40.5	28.1	0.427		
	25	47.4	25.2	22.6	0.530		
200	100	205.8	128.6	19.2	0.625	24.7	0.486
	75	154.4	81.9	22.6	0.531		
	50	102.9	44.9	27.5	0.437		
	25	51.5	28.2	21.9	0.547		

1. Rated in accordance with ARI Standard 550/590, based on evaporator temperature drop of 10°F, 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.
5. EER – Energy Efficiency Ratio (Btu/W·h). Power inputs include compressors and control power.

Table 11. Performance Data - standard efficiency - 60 Hz - SI units

Evaporator Leaving Water Temperature (°C)	Unit Size	Condenser Entering Water Temperature (°C)								
		25			30			35		
		kW Cooling	kW input	COP	kW Cooling	kW input	COP	kW Cooling	kW input	COP
5	80	268.0	50.9	5.2	252.5	56.8	4.4	235.9	63.5	3.7
	90	306.2	58.0	5.2	289.8	64.7	4.5	272.4	72.3	3.7
	100	350.3	66.9	5.2	331.3	74.9	4.4	311.1	84.0	3.7
	110	396.8	75.8	5.2	375.0	85.1	4.4	352.0	95.7	3.7
	120	435.0	81.8	5.3	411.1	91.6	4.5	386.0	102.9	3.7
	130	462.6	87.3	5.3	437.4	97.7	4.5	410.9	109.6	3.7
	140	505.4	95.9	5.2	477.9	107.1	4.4	449.0	120.0	3.7
7	80	287.5	51.6	5.5	271.2	57.3	4.7	253.9	63.9	3.9
	90	327.8	58.8	5.5	310.6	65.2	4.7	292.5	72.6	4.0
	100	375.0	67.7	5.5	355.2	75.5	4.7	334.2	84.4	3.9
	110	424.8	76.6	5.5	402.1	85.7	4.7	378.2	96.2	3.9
	120	466.4	82.8	5.6	441.4	92.4	4.8	415.2	103.5	4.0
	130	496.0	88.4	5.6	469.6	98.6	4.7	441.9	110.3	4.0
	140	542.1	97.0	5.6	513.4	108.0	4.7	483.0	120.6	4.0
9	80	307.7	52.3	5.8	290.7	57.9	5.0	272.6	64.4	4.2
	90	350.2	59.6	5.8	332.3	65.9	5.0	313.4	73.2	4.3
	100	400.7	68.5	5.8	380.1	76.2	5.0	358.3	85.0	4.2
	110	453.8	77.6	5.8	430.3	86.5	5.0	405.5	96.8	4.2
	120	499.1	83.9	5.9	473.1	93.4	5.0	445.8	104.3	4.3
	130	530.8	89.6	5.9	503.3	99.7	5.0	474.4	111.2	4.3
	140	580.4	98.4	5.9	550.3	109.2	5.0	518.4	121.5	4.3

1. Rated in accordance with ARI Standard 550/590, based on an evaporator temperature drop of 5.6°C, 0.054 L/s per kW on the condenser, 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. Consult Trane representative for additional performance information.
4. kW input is for compressors only.
5. COP–Coefficient of Performance. Power inputs include compressors and control power.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Table 12. Performance Data - 60 Hz - high efficiency - SI units

Evaporator Leaving Water Temperature (°C)	Unit Size	Condenser Entering Water Temperature (°C)								
		25			30			35		
		kW Cooling	kW input	COP	kW Cooling	kW input	COP	kW Cooling	kW input	COP
5	80	284.6	50.1	5.6	268.3	55.7	4.8	250.9	62.2	4.0
	90	331.9	57.9	5.7	313.8	64.2	4.9	294.6	71.5	4.1
	100	382.1	66.3	5.7	361.0	73.8	4.9	338.8	82.6	4.1
	110	432.9	74.7	5.8	408.9	83.5	4.9	383.6	93.7	4.1
	120	461.1	79.6	5.8	435.7	89.0	4.9	409.0	99.8	4.1
	130	489.8	84.4	5.8	463.1	94.2	4.9	435.1	105.6	4.1
	150	533.8	93.3	5.7	505.2	104.1	4.8	474.9	116.6	4.1
	160	582.6	101.5	5.7	551.6	113.2	4.9	518.4	126.7	4.1
	180	635.5	109.5	5.8	602.2	121.9	4.9	566.9	136.3	4.1
	200	690.5	117.5	5.9	654.8	130.5	5.0	617.5	145.7	4.2
	220	755.7	132.8	5.7	717.0	147.6	4.8	676.4	164.9	4.1
	250	830.9	146.2	5.7	788.0	162.5	4.8	743.0	181.4	4.1
7	80	305.5	50.7	6.0	288.4	56.2	5.1	270.2	62.6	4.3
	90	356.1	58.7	6.0	337.1	64.9	5.2	317.0	72.0	4.4
	100	410.2	67.1	6.1	388.1	74.5	5.2	364.9	83.1	4.4
	110	464.6	75.6	6.1	439.6	84.2	5.2	413.3	94.2	4.4
	120	494.9	80.5	6.1	468.5	89.7	5.2	440.7	100.3	4.4
	130	525.8	85.3	6.1	498.0	94.9	5.2	468.7	106.1	4.4
	150	572.8	94.2	6.1	542.9	104.8	5.2	511.2	117.1	4.4
	160	625.1	102.5	6.1	592.8	114.0	5.2	558.0	127.1	4.4
	180	681.7	110.8	6.1	647.0	122.9	5.2	610.1	137.0	4.4
	200	740.6	119.0	6.2	703.3	131.8	5.3	664.3	146.7	4.5
	220	810.1	134.4	6.0	769.7	148.9	5.2	727.2	165.9	4.4
	250	891.4	148.0	6.0	846.4	163.9	5.2	799.3	182.4	4.4
9	80	327.2	51.4	6.3	309.4	56.8	5.4	290.4	63.0	4.6
	90	381.3	59.7	6.3	361.5	65.7	5.5	340.5	72.6	4.7
	100	439.4	68.0	6.4	416.5	75.3	5.5	392.3	83.7	4.7
	110	497.4	76.6	6.5	471.6	85.0	5.5	444.3	94.8	4.7
	120	530.2	81.6	6.5	502.8	90.5	5.5	473.8	100.9	4.7
	130	563.5	86.4	6.5	534.5	95.8	5.6	503.9	106.7	4.7
	150	613.4	95.3	6.4	582.3	105.7	5.5	549.1	117.7	4.6
	160	669.2	103.7	6.4	635.7	114.9	5.5	599.3	127.8	4.7
	180	729.9	112.2	6.5	693.7	124.1	5.6	655.1	137.9	4.7
	200	792.9	120.8	6.5	753.9	133.3	5.6	713.1	147.9	4.8
	220	866.7	136.3	6.3	824.5	150.5	5.5	780.3	167.1	4.7
	250	954.3	150.0	6.3	907.3	165.6	5.5	858.1	183.7	4.7

1. Rated in accordance with ARI Standard 550/590, based on an evaporator temperature drop of 5.6°C, 0.054 L/s per kW on the condenser, 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. Consult Trane representative for additional performance information.
4. kW input is for compressors only.
5. COP–Coefficient of Performance. Power inputs include compressors and control power.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Table 13. Performance Data - 60 Hz - premium efficiency - SI units

Evaporator Leaving Water Temperature (°C)	Unit Size	Condenser Entering Water Temperature (°C)								
		25			30			35		
		kW Cooling	kW input	COP	kW Cooling	kW input	COP	kW Cooling	kW input	COP
5	150	554.7	91.2	6.1	524.3	101.6	5.1	492.1	113.8	4.3
	160	605.5	99.6	6.1	572.8	111.0	5.1	537.8	124.1	4.3
	180	658.2	107.5	6.1	623.2	119.5	5.2	586.2	133.5	4.4
	200	714.2	116.0	6.1	676.7	128.6	5.2	637.6	143.4	4.4
7	150	597.0	92.2	6.5	565.3	102.4	5.5	531.4	114.2	4.6
	160	651.2	100.7	6.4	617.1	111.7	5.5	580.3	124.5	4.6
	180	707.7	108.8	6.5	671.1	120.5	5.6	632.2	134.2	4.7
	200	767.7	117.6	6.5	728.4	129.9	5.6	687.2	144.4	4.7
9	150	641.3	93.3	6.8	608.2	103.3	5.9	572.7	114.8	5.0
	160	698.7	101.8	6.8	663.4	112.7	5.9	624.9	125.2	5.0
	180	759.4	110.3	6.9	721.3	121.7	5.9	680.6	135.1	5.0
	200	823.9	119.4	6.9	782.6	131.4	5.9	739.4	145.6	5.1

1. Rated in accordance with ARI Standard 550/590, based on an evaporator temperature drop of 5.6°C, 0.054 L/s per kW on the condenser, 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. Consult Trane representative for additional performance information.
4. kW input is for compressors only.
5. COP–Coefficient of Performance. Power inputs include compressors and control power.
6. Interpolation between points is permissible. Extrapolation is not permitted.

Table 14. Part Load Performance - 60 Hz - standard efficiency - SI units

Unit Size	% Load	Cooling kW	kW Input	COP	IPLV COP
80	100	269.7	57	4.74	6.31
	75	202.2	35.2	5.75	
	50	135	19.3	7.00	
	25	67.5	11.6	5.84	
90	100	309.1	64.8	4.77	6.30
	75	231.7	39.7	5.83	
	50	154.4	22.3	6.92	
	25	77.4	13.4	5.77	
100	100	353.4	74.8	4.72	6.35
	75	264.8	46.4	5.72	
	50	176.5	25.6	6.91	
	25	88.3	16.7	6.54	
110	100	400.1	84.9	4.71	6.25
	75	299.9	53	5.65	
	50	200.1	28.7	6.96	
	25	99.9	17.3	5.77	
120	100	438.8	91.5	4.80	6.38
	75	329.1	57.5	5.73	
	50	219.4	31.1	7.06	
	25	109.7	17.6	6.25	
130	100	466.9	97.6	4.78	6.23
	75	350.2	61.5	5.69	
	50	233.5	33.6	6.95	
	25	116.7	20.9	5.58	
140	100	510.5	107	4.77	6.30
	75	382.9	68.6	5.58	
	50	255.3	36.1	7.07	
	25	127.6	20.9	6.10	

1. Rated in accordance with ARI Standard 550/590, based on an evaporator temperature drop of 5.6°C, 0.054 L/s per kW on the condenser, 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. Consult Trane representative for additional performance information.
4. kW input is for compressors only.
5. COP–Coefficient of Performance. Power inputs include compressors and control power.

Table 15. Part Load Performance - 60 Hz - high efficiency - SI units

Unit Size	% Load	Cooling kW	kW Input	COP	IPLV COP
80	100	286.9	55.9	5.13	6.83
	75	215.2	34.5	6.25	
	50	143.5	19	7.56	
	25	71.7	11.5	6.26	
90	100	335.1	64.4	5.20	6.88
	75	251.4	39.5	6.37	
	50	167.7	22.2	7.55	
	25	83.7	13.2	6.34	
100	100	386.1	73.9	5.22	7.07
	75	289.4	45.7	6.32	
	50	193.0	24.9	7.76	
	25	96.3	13.3	7.28	
110	100	437.0	83.4	5.24	6.95
	75	327.7	52.1	6.29	
	50	218.7	28.3	7.73	
	25	109.3	17	6.42	
120	100	465.9	88.8	5.24	6.92
	75	349.1	55.9	6.25	
	50	232.8	30.5	7.64	
	25	116.4	17.2	6.76	
130	100	495.0	94	5.26	6.84
	75	371.3	59.4	6.26	
	50	247.5	32.4	7.63	
	25	123.8	20.3	6.10	
150	100	539.7	103.8	5.19	6.77
	75	404.7	66.7	6.06	
	50	270.0	35.9	7.51	
	25	135.0	20.4	6.60	
160	100	589.3	112.9	5.22	6.72
	75	442.0	73	6.06	
	50	294.6	38.8	7.59	
	25	147.3	24.9	5.92	
180	100	643.1	121.7	5.28	6.88
	75	482.4	78.1	6.18	
	50	321.4	41.7	7.71	
	25	160.7	25.2	6.38	

Table 15. Part Load Performance - 60 Hz - high efficiency - SI units

Unit Size	% Load	Cooling kW	kW Input	COP	IPLV COP
200	100	699.0	130.4	5.36	6.88
	75	524.2	83.2	6.30	
	50	349.5	45.8	7.64	
	25	174.7	28.4	6.16	
220	100	765.1	147.4	5.19	6.67
	75	573.8	95	6.04	
	50	382.5	52.5	7.28	
	25	191.3	28.6	6.68	
250	100	841.4	162.2	5.19	6.62
	75	630.8	106.1	5.95	
	50	420.5	56.2	7.48	
	25	210.3	35.9	5.87	

1. Rated in accordance with ARI Standard 550/590, based on an evaporator temperature drop of 5.6°C, 0.054 L/s per kW on the condenser, 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. Consult Trane representative for additional performance information.
4. kW input is for compressors only.
5. COP–Coefficient of Performance. Power inputs include compressors and control power.

Table 16. Part Load Performance - 60 Hz - premium efficiency - SI units

Unit Size	% Load	Cooling kW	kW Input	COP	IPLV COP
150	100	561.9	101.4	5.54	7.28
	75	421.2	65.1	6.48	
	50	280.9	34.4	8.18	
	25	140.3	20.3	6.91	
160	100	613.2	110.7	5.54	7.15
	75	459.9	71.5	6.43	
	50	306.6	37.9	8.10	
	25	153.3	24.7	6.21	
180	100	667.0	119.3	5.59	7.29
	75	500.3	76.5	6.54	
	50	333.3	40.5	8.23	
	25	166.7	25.2	6.63	
200	100	723.6	128.6	5.63	7.23
	75	542.9	81.9	6.62	
	50	361.8	44.9	8.05	
	25	181.1	28.2	6.43	

1. Rated in accordance with ARI Standard 550/590, based on an evaporator temperature drop of 5.6°C, 0.054 L/s per kW on the condenser, 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. Consult Trane representative for additional performance information.
4. kW input is for compressors only.
5. COP–Coefficient of Performance. Power inputs include compressors and control power.

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:
  - 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
  - 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.

Regulatory Compliance Documentation

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

Easy Operation and Maintenance

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

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

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

Electrical Data

Table 17. Electrical Data - 60 Hz - standard efficiency, standard condenser 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 80	230/60/3	1	188	70	82/82	238/238	912/912
	230/60/3	2	106/103	35/35			
	380/60/3	1	115	35	50/50	138/138	456/456
	380/60/3	2	65/63	16/16			
	460/60/3	1	94	25	41/41	114/114	376/376
	460/60/3	2	53/51	10/10			
RTWD 90	230/60/3	1	217	95	95/95	262/262	1003/1003
	230/60/3	2	122/119	35/35			
	380/60/3	1	130	50	57/57	161/161	530/530
	380/60/3	2	73/71	16/16			
	460/60/3	1	110	35	48/48	131/131	433/433
	460/60/3	2	62/60	16/16			
RTWD 100	230/60/3	1	252	120	95/123	262/294	1003/1137
	230/60/3	2	122/154	35/70			
	380/60/3	1	153	50	57/75	161/177	530/566
	380/60/3	2	73/94	16/25			
	460/60/3	1	127	50	48/62	131/147	433/471
	460/60/3	2	62/78	16/16			
RTWD 110	230/60/3	1	280	150	123/123	294/294	1137/1137
	230/60/3	2	157/154	70/70			
	380/60/3	1	171	70	75/75	177/177	566/566
	380/60/3	2	96/94	25/25			
	460/60/3	1	141	50	62/62	147/147	471/471
	460/60/3	2	79/78	16/16			

1. MCA-minimum circuit ampacity
2. RLA-rated load amps
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.

Table 17. Electrical Data - 60 Hz - standard efficiency, standard condenser 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 120	230/60/3	1	309	150	123/146	294/367	1137/1368
	230/60/3	2	157/183	70/70			
	380/60/3	1	187	70	75/88	177/229	566/747
	380/60/3	2	96/110	25/35			
	460/60/3	1	155	70	62/73	147/184	471/600
	460/60/3	2	79/91	16/25			
RTWD 130	230/60/3	1	332	185	146/146	367/367	1368/1368
	230/60/3	2	186/183	70/70			
	380/60/3	1	200	95	88/88	229/229	747/747
	380/60/3	2	112/110	35/35			
	460/60/3	1	166	70	73/73	184/184	600/600
	460/60/3	2	93/91	25/25			
RTWD 140	230/60/3	1	368	240	146/175	367/427	1368/1498
	230/60/3	2	186/219	70/95			
	380/60/3	1	223	95	88/106	229/260	747/801
	380/60/3	2	112/133	35/50			
	460/60/3	1	185	70	73/88	184/212	600/652
	460/60/3	2	93/110	25/35			

1. MCA-minimum circuit ampacity
2. RLA-rated load amps
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.

Table 18. Electrical Data - 60 Hz - high efficiency, standard condenser temp

			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 80	230/60/3	1	184	70	80/80	238/238	912/912
	230/60/3	2	104/100	35/25			
	380/60/3	1	112	35	49/49	138/138	456/456
	380/60/3	2	63/61	16/16			
	460/60/3	1	92	25	40/40	114/114	376/376
	460/60/3	2	52/50	10/10			
RTWD 90	230/60/3	1	213	95	93/93	262/262	1003/1003
	230/60/3	2	120/116	35/35			
	380/60/3	1	128	50	56/56	161/161	530/530
	380/60/3	2	72/70	16/16			
	460/60/3	1	108	35	47/47	131/131	433/433
	460/60/3	2	61/59	16/10			
RTWD 100	230/60/3	1	247	120	93/120	262/294	1003/1137
	230/60/3	2	120/150	35/50			
	380/60/3	1	149	50	56/73	161/177	530/566
	380/60/3	2	72/91	16/25			
	460/60/3	1	124	35	47/60	131/147	433/471
	460/60/3	2	61/75	16/16			
RTWD 110	230/60/3	1	274	120	120/120	294/294	1137/1137
	230/60/3	2	154/150	70/50			
	380/60/3	1	166	70	73/73	177/177	566/566
	380/60/3	2	93/91	25/25			
	460/60/3	1	137	50	60/60	147/147	471/471
	460/60/3	2	77/75	16/16			
RTWD 120	230/60/3	1	302	150	120/143	294/367	1137/1368
	230/60/3	2	154/179	70/70			
	380/60/3	1	184	70	73/87	177/229	566/747
	380/60/3	2	93/109	25/35			
	460/60/3	1	152	50	60/72	147/184	471/600
	460/60/3	2	77/90	16/25			
RTWD 130	230/60/3	1	325	185	143/143	367/367	1368/1368
	230/60/3	2	182/179	70/70			
	380/60/3	1	198	95	87/87	229/229	747/747
	380/60/3	2	111/109	35/35			
	460/60/3	1	164	70	72/72	184/184	600/600
	460/60/3	2	92/90	25/25			

1. MCA-minimum circuit ampacity
2. RLA-rated load amps
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.

Table 18. Electrical Data - 60 Hz - high efficiency, standard condenser temp

			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 150	230/60/3	1	361	185	143/171	367/427	1200/1314
	230/60/3	2	183/214	70/95			
	380/60/3	1	218	95	87/103	229/260	747/801
	380/60/3	2	111/129	35/35			
	460/60/3	1	182	70	72/86	184/212	600/652
	460/60/3	2	92/108	25/35			
RTWD 160	230/60/3	1	389	240	171/171	427/427	1314/1314
	230/60/3	2	218/214	95/95			
	380/60/3	1	234	95	103/103	260/260	801/801
	380/60/3	2	131/129	50/35			
	460/60/3	1	196	70	86/86	212/212	652/652
	460/60/3	2	110/108	35/35			
RTWD 180	230/60/3	1	421	240	171/197	427/506	1314/1556
	230/60/3	2	218/247	95/120			
	380/60/3	1	256	120	103/120	260/316	801/973
	380/60/3	2	131/150	50/50			
	460/60/3	1	213	95	86/100	212/252	652/774
	460/60/3	2	110/125	35/35			
RTWD 200	230/60/3	1	447	300	197/197	506/506	1556/1556
	230/60/3	2	250/247	120/120			
	380/60/3	1	273	120	120/120	316/316	973/973
	380/60/3	2	153/150	50/50			
	460/60/3	1	227	95	100/100	252/252	774/774
	460/60/3	2	127/125	35/35			
RTWD 220	230/60/3	1	509	300	197/246	506/571	1556/1756
	230/60/3	2	250/308	120/150			
	380/60/3	1	309	150	120/149	316/345	973/1060
	380/60/3	2	153/187	50/70			
	460/60/3	1	256	120	100/123	252/285	774/878
	460/60/3	2	127/154	35/50			
RTWD 250	230/60/3	1	558	2*120	246/246	571/571	1756/1756
	230/60/3	2	312/308	150/150			
	380/60/3	1	338	185	149/149	345/345	1060/1060
	380/60/3	2	189/187	70/70			
	460/60/3	1	279	120	123/123	285/285	878/878
	460/60/3	2	156/154	50/50			

1. MCA-minimum circuit ampacity
2. RLA-rated load amps
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.

Table 19. Electrical Data - 60 Hz - high 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 80	230/60/3	1	229	95	100/100	238/238	912/912
	230/60/3	2	129/125	50/35			
	380/60/3	1	139	50	61/61	138/138	456/456
	380/60/3	2	78/76	16/16			
	460/60/3	1	114	35	50/50	114/114	376/376
	460/60/3	2	64/63	16/16			
RTWD 90	230/60/3	1	278	150	122/122	262/262	1003/1003
	230/60/3	2	156/153	70/50			
	380/60/3	1	169	70	74/74	161/161	530/530
	380/60/3	2	95/93	25/25			
	460/60/3	1	139	50	61/61	131/131	433/433
	460/60/3	2	78/76	16/16			
RTWD100	230/60/3	1	317	150	122/153	262/294	1003/1137
	230/60/3	2	156/191	70/70			
	380/60/3	1	192	70	74/93	161/177	530/566
	380/60/3	2	95/116	25/35			
	460/60/3	1	159	70	61/77	131/147	433/471
	460/60/3	2	78/96	16/25			
RTWD 110	230/60/3	1	348	185	153/153	294/294	1137/1137
	230/60/3	2	195/191	70/70			
	380/60/3	1	211	95	93/93	177/177	566/566
	380/60/3	2	118/116	35/35			
	460/60/3	1	175	70	77/77	147/147	471/471
	460/60/3	2	98/96	25/25			
RTWD 120	230/60/3	1	380	240	153/179	294/367	1137/1368
	230/60/3	2	195/224	70/95			
	380/60/3	1	230	95	93/108	177/229	566/747
	380/60/3	2	118/135	35/50			
	460/60/3	1	191	70	77/90	147/184	471/600
	460/60/3	2	98/113	25/35			
RTWD 130	230/60/3	1	406	240	179/179	367/367	1368/1368
	230/60/3	2	227/224	95/95			
	380/60/3	1	245	120	108/108	229/229	747/747
	380/60/3	2	137/135	50/50			
	460/60/3	1	204	95	90/90	184/184	600/600
	460/60/3	2	114/113	35/35			

1. MCA-minimum circuit ampacity
2. RLA-rated load amps
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 95°F (35°C).

Table 19. Electrical Data - 60 Hz - high 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 150	230/60/3	1	438	240	179/204	367/427	1200/1314
	230/60/3	2	228/255	95/120			
	380/60/3	1	267	120	108/125	229/260	747/801
	380/60/3	2	138/157	50/70			
	460/60/3	1	220	95	90/102	184/212	600/652
	460/60/3	2	115/128	35/50			
RTWD 160	230/60/3	1	463	300	204/204	427/427	1314/1314
	230/60/3	2	259/255	120/120			
	380/60/3	1	284	150	125/125	260/260	801/801
	380/60/3	2	159/157	70/70			
	460/60/3	1	232	95	102/102	212/212	652/652
	460/60/3	2	130/128	50/50			
RTWD 180	230/60/3	1	512	2*120	204/243	427/506	1314/1556
	230/60/3	2	259/304	120/150			
	380/60/3	1	309	150	125/145	260/316	801/973
	380/60/3	2	159/182	70/70			
	460/60/3	1	253	120	102/119	212/252	652/774
	460/60/3	2	130/149	50/50			
RTWD 200	230/60/3	1	551	2*120	243/243	506/506	1556/1556
	230/60/3	2	308/304	150/150			
	380/60/3	1	327	185	144/144	316/316	973/973
	380/60/3	2	183/180	70/70			
	460/60/3	1	270	120	119/119	252/252	774/774
	460/60/3	2	151/149	50/50			
RTWD 220	230/60/3	1	608	2*150	243/289	506/571	1556/1756
	230/60/3	2	308/362	150/185			
	380/60/3	1	373	240	145/180	316/345	973/1060
	380/60/3	2	184/225	70/95			
	460/60/3	1	303	150	119/145	252/285	774/878
	460/60/3	2	151/182	50/70			
RTWD 250	230/60/3	1	654	2*185	289/289	571/571	1756/1756
	230/60/3	2	365/362	185/185			
	380/60/3	1	408	240	180/180	345/345	1060/1060
	380/60/3	2	228/225	95/95			
	460/60/3	1	329	185	145/145	285/285	878/878
	460/60/3	2	184/182	70/70			

1. MCA-minimum circuit ampacity
2. RLA-rated load amps
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 95°F (35°C).

Table 20. Electrical Data – 60 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 150	230/60/3	1	430	185	172/203	367/427	1200/1314
	230/60/3	2	219/254	70/95			
	380/60/3	1	266	95	108/124	229/260	747/801
	380/60/3	2	138/155	35/35			
	460/60/3	1	218	70	88/102	184/212	600/652
	460/60/3	2	112/128	25/25			
RTWD 160	230/60/3	1	461	240	203/203	427/427	1314/1314
	230/60/3	2	258/254	95/95			
	380/60/3	1	282	95	124/124	260/260	801/801
	380/60/3	2	158/155	35/35			
	460/60/3	1	232	70	102/102	212/212	652/652
	460/60/3	2	130/128	35/35			
RTWD 180	230/60/3	1	511	240	203/243	427/506	1314/1556
	230/60/3	2	258/304	95/120			
	380/60/3	1	307	120	124/144	260/316	801/973
	380/60/3	2	158/180	35/50			
	460/60/3	1	253	95	102/119	212/252	652/774
	460/60/3	2	130/149	35/35			
RTWD 200	230/60/3	1	551	300	243/243	506/506	1556/1556
	230/60/3	2	308/304	120/120			
	380/60/3	1	327	120	144/144	316/316	973/973
	380/60/3	2	183/180	50/50			
	460/60/3	1	270	95	119/119	252/252	774/774
	460/60/3	2	151/149	35/35			

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 WD–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 21. Electrical Data – 60Hz – 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 150	230/60/3	1	430	240	172/203	367/427	1200/1314
	230/60/3	2	219/2554	95/120			
	380/60/3	1	266	120	108/124	229/260	747/801
	380/60/3	2	138/155	50/70			
	460/60/3	1	218	95	88/102	184/212	600/652
	460/60/3	2	112/128	35/50			
RTWD 160	230/60/3	1	461	300	203/203	427/427	1314/1314
	230/60/3	2	258/254	120/120			
	380/60/3	1	282	150	124/124	260/260	801/801
	380/60/3	2	158/155	70/70			
	460/60/3	1	232	95	102/102	212/212	652/652
	460/60/3	2	130/128	50/50			
RTWD 180	230/60/3	1	511	2*120	203/243	427/506	1314/1556
	230/60/3	2	258/304	120/150			
	380/60/3	1	307	150	124/144	260/316	801/973
	380/60/3	2	158/180	70/70			
	460/60/3	1	253	120	102/119	212/252	652/774
	460/60/3	2	130/149	50/50			
RTWD 200	230/60/3	1	551	2*120	243/243	506/506	1556/1556
	230/60/3	2	308/304	150/150			
	380/60/3	1	327	185	144/144	316/316	973/973
	380/60/3	2	183/180	70/70			
	460/60/3	1	270	120	119/119	252/252	774/774
	460/60/3	2	151/149	50/50			

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 WD–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. High condensing temperature option refers to entering condenser water temperatures above 95F (35C).

Electrical Connections

Figure 1. Field Wiring Diagram

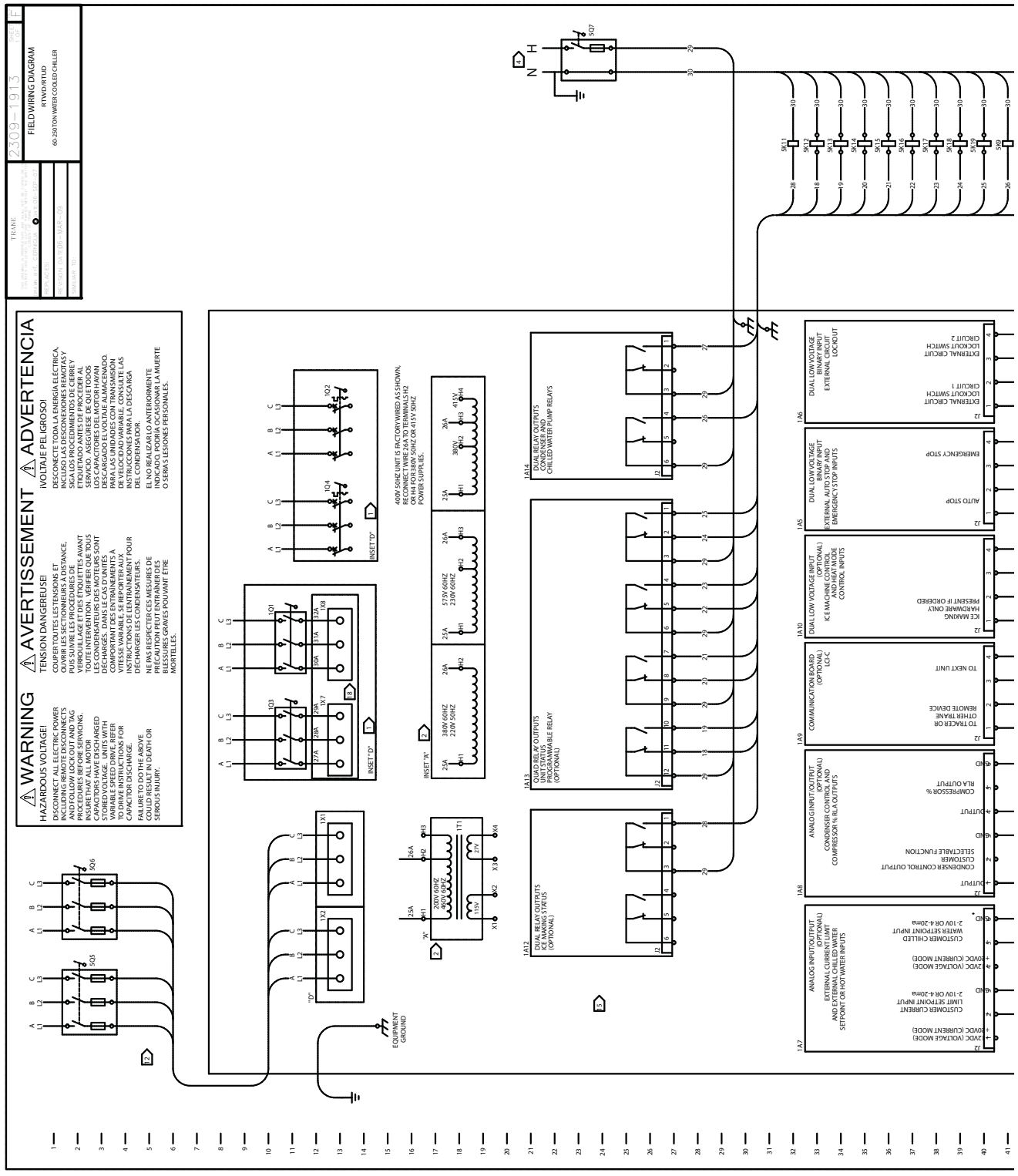


Figure 2. Field Wiring Diagram (continued)

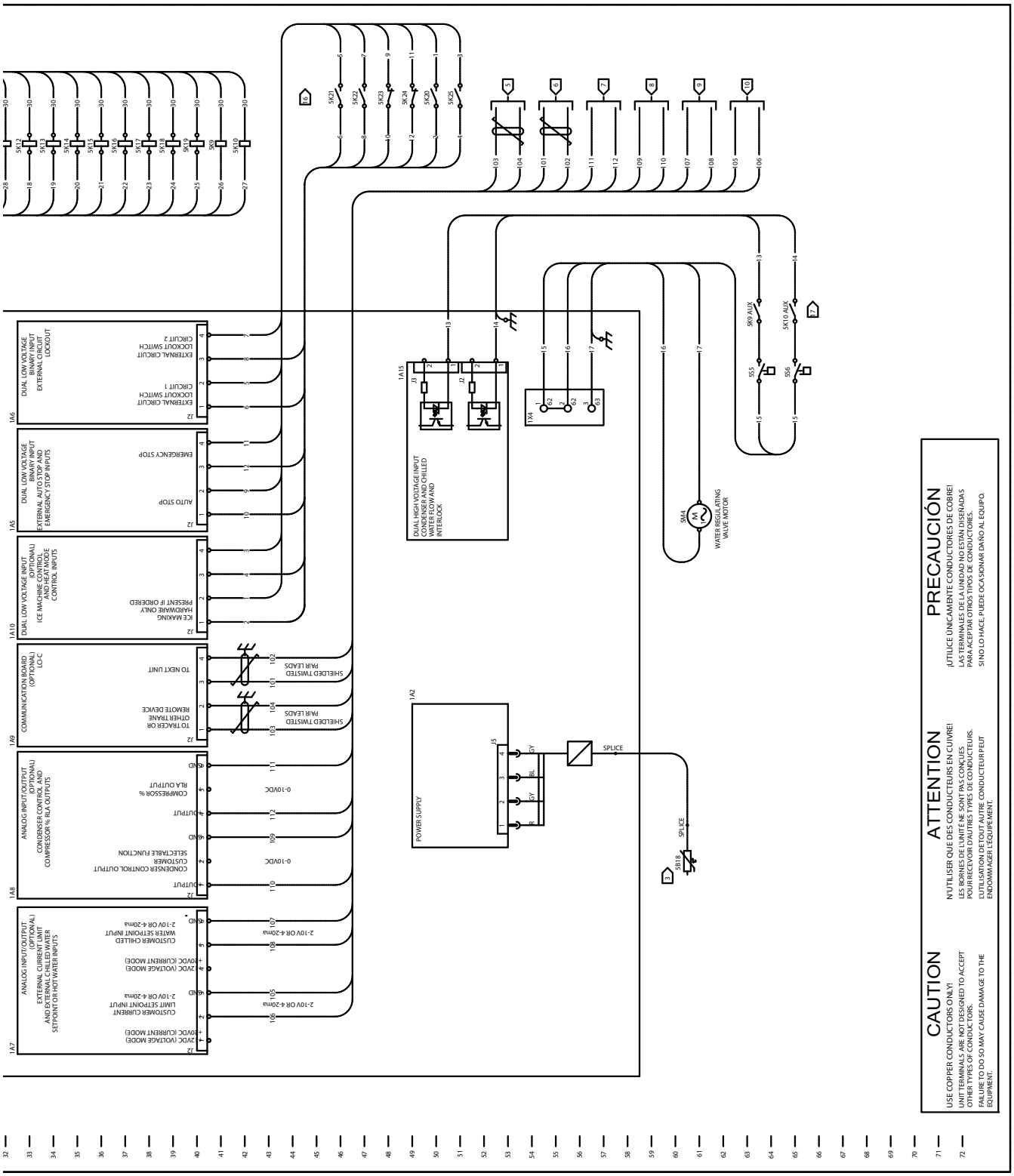


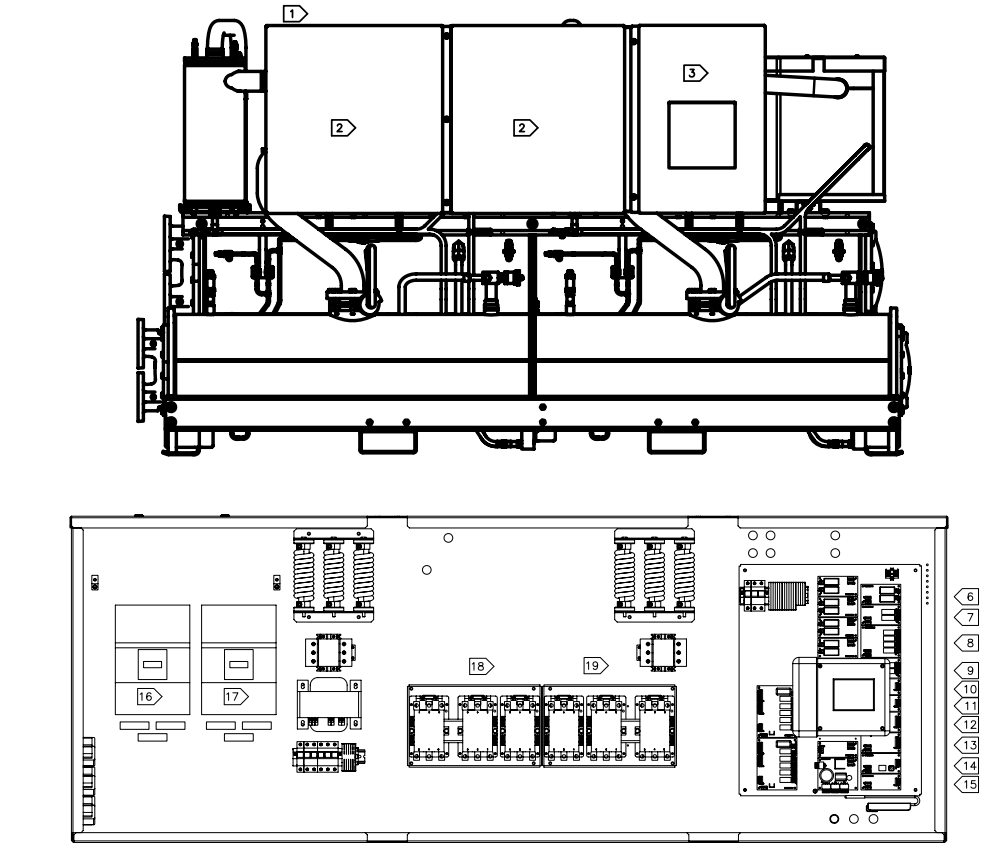
Table 22. Field Wiring Diagram Notes

#	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	For voltages 200 V/60 Hz, 220V/50Hz, 380 V/60 Hz, 460 V/60 Hz, wire 26A shall be connected to H2. For voltages 230 V/60 Hz and 575 V/60 Hz, wire 26A shall be connected to H3.
3	Factory installed outdoor air temperature sensor lead length to be spliced and extended by customer.
4	Customer supplied power 115/60/1 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)
230	**60**	1F13, 14	CC	2	8
		1F18, 19, 20, 21	CC	4	3
		1F16, 17	CC	2	6
		1F15	CC	1	10
380	**60**	1F13, 14	CC	2	5
		1F18, 19, 20, 21	CC	4	3
		1F16, 17	CC	2	6
		1F15	CC	1	10
460	**60**	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 23. 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 115/60/1 customer power is required.	optional	1A14, (5K10 and 5K9)
8	Unit status programmable relay outputs. Separate 115/60/1 customer power is required.	optional	1A13, (5K12–5K19)
9	Ice making status relay output. Separate 115/60/1 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

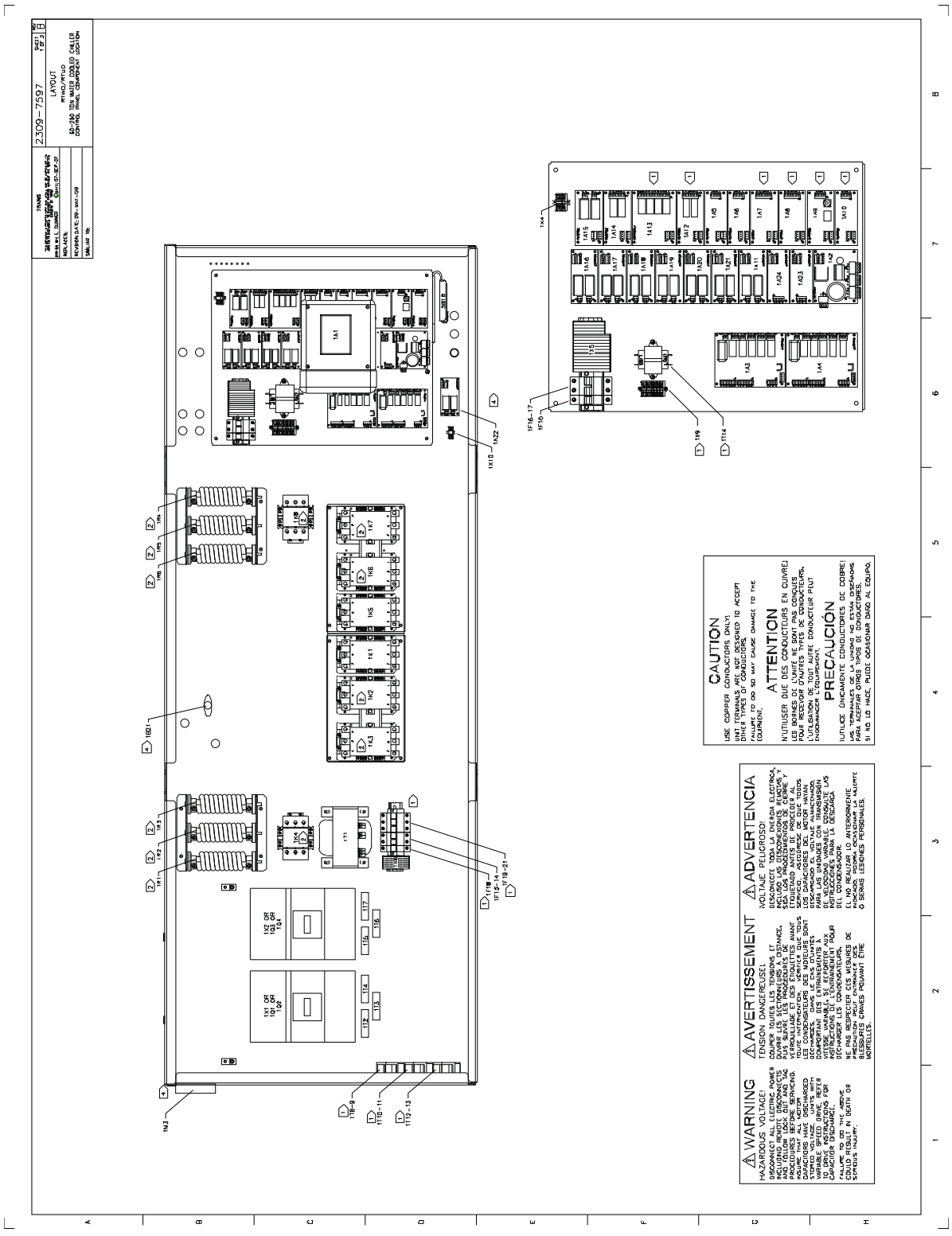
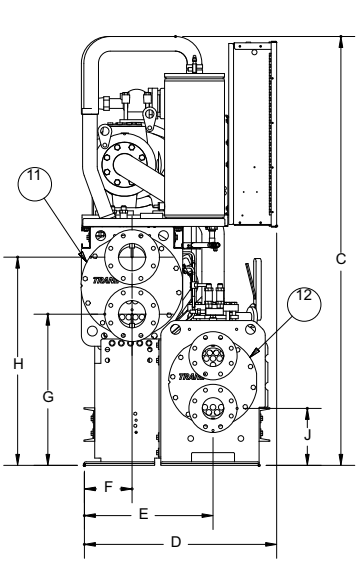


Table 24. Layout Notes

	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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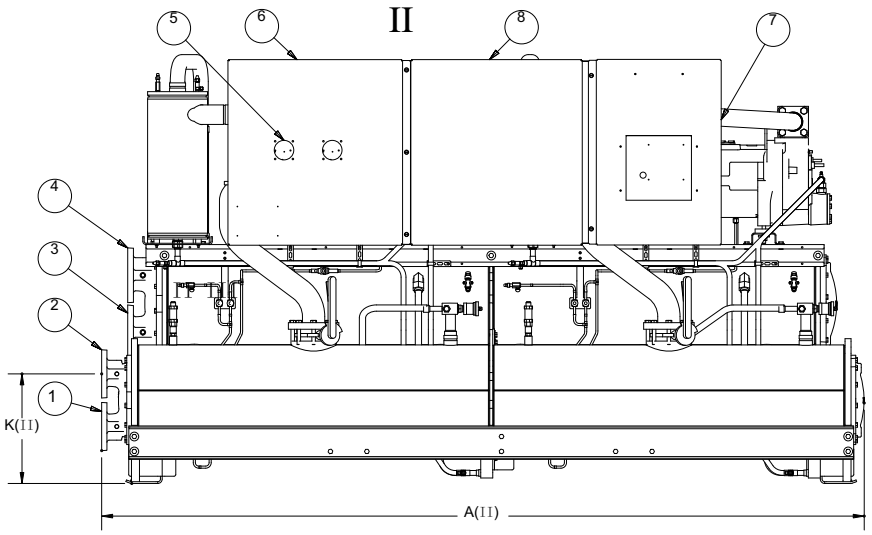
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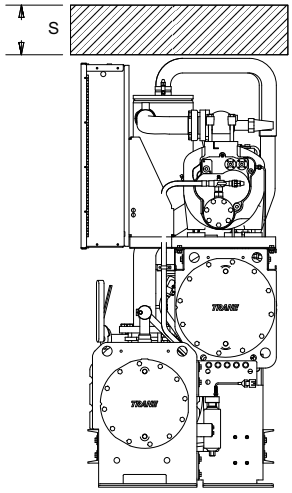
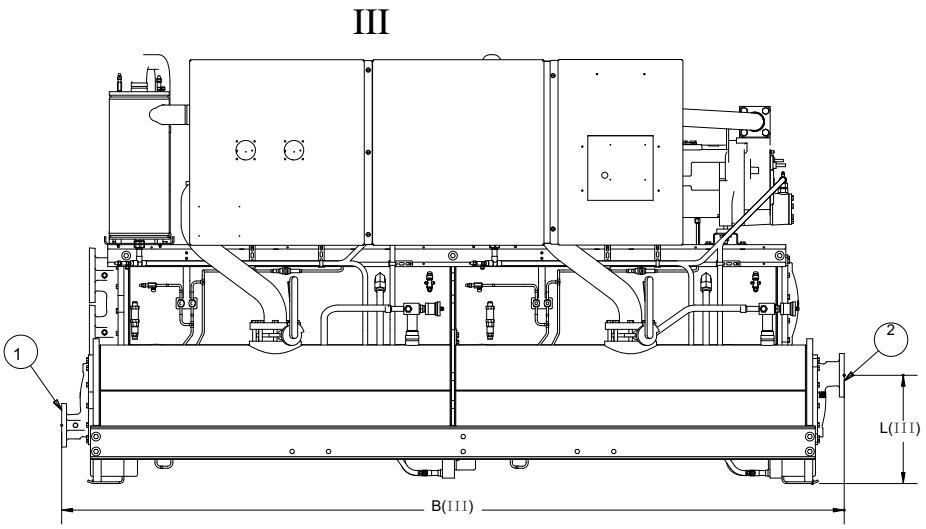
K(II)
A(II)


S


III
1
2
L(III)
B(III)

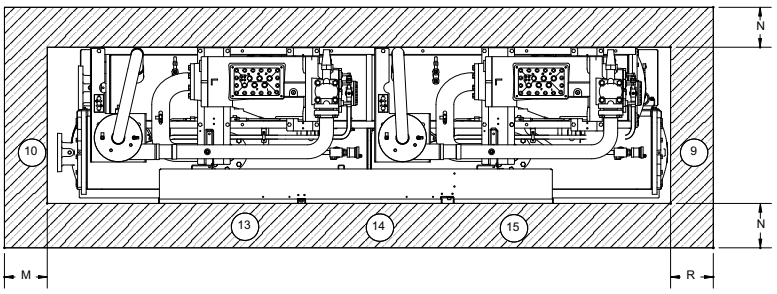

N
10
9
13
14
15
N
M
R

Table 25. 60 Hz Dimensions - 80-140 ton

RTWD	Standard Efficiency		High Efficiency	
	80,90,100,110 inch/mm	120,130,140 inch/mm	80,90 inch/mm	100,110,120,130 inch/mm
A (2 pass evap)	138.2/3510	138.8/3525	126.4/3210	127.0/3225
B (3 pass evap)	142.5/3620	142.5/3620	130.7/3320	130.7/3320
C	75.9/1929	76.9/1955	76.1/1933	76.9/1955
D	34.3/871	34.8/884	35.1/890	35.0/890
E	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
G	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
J (2 pass evap)	11.0/280	10.6/268	10.8/273	10.2/259
J (3 pass evap)	10.4/265	10.1/256	10.2/258	9.8/247
K (2 pass evap)	18.9/479	19.2/488	18.6/472	18.9/479
L (3 pass evap)	19.5/495	19.5/496	19.2/488	19.2/487
M	36/914	36/914	36/914	36/914
N*	36/914*	36/914*	36/914*	36/914*
R	127/3226	127/3226	115/2921	115/2921
S	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]
14	Panel Power Section [door swing]
15	Panel Control Section [door swing]
II	2 Pass Evaporator Unit
III	3 Pass Evaporator Unit
*	clearance required to other ground parts, two units with panels facing each other or other live parts require a clearance of
**	Sound attenuator may increase the footprint - submittal should be used.

Dimensions

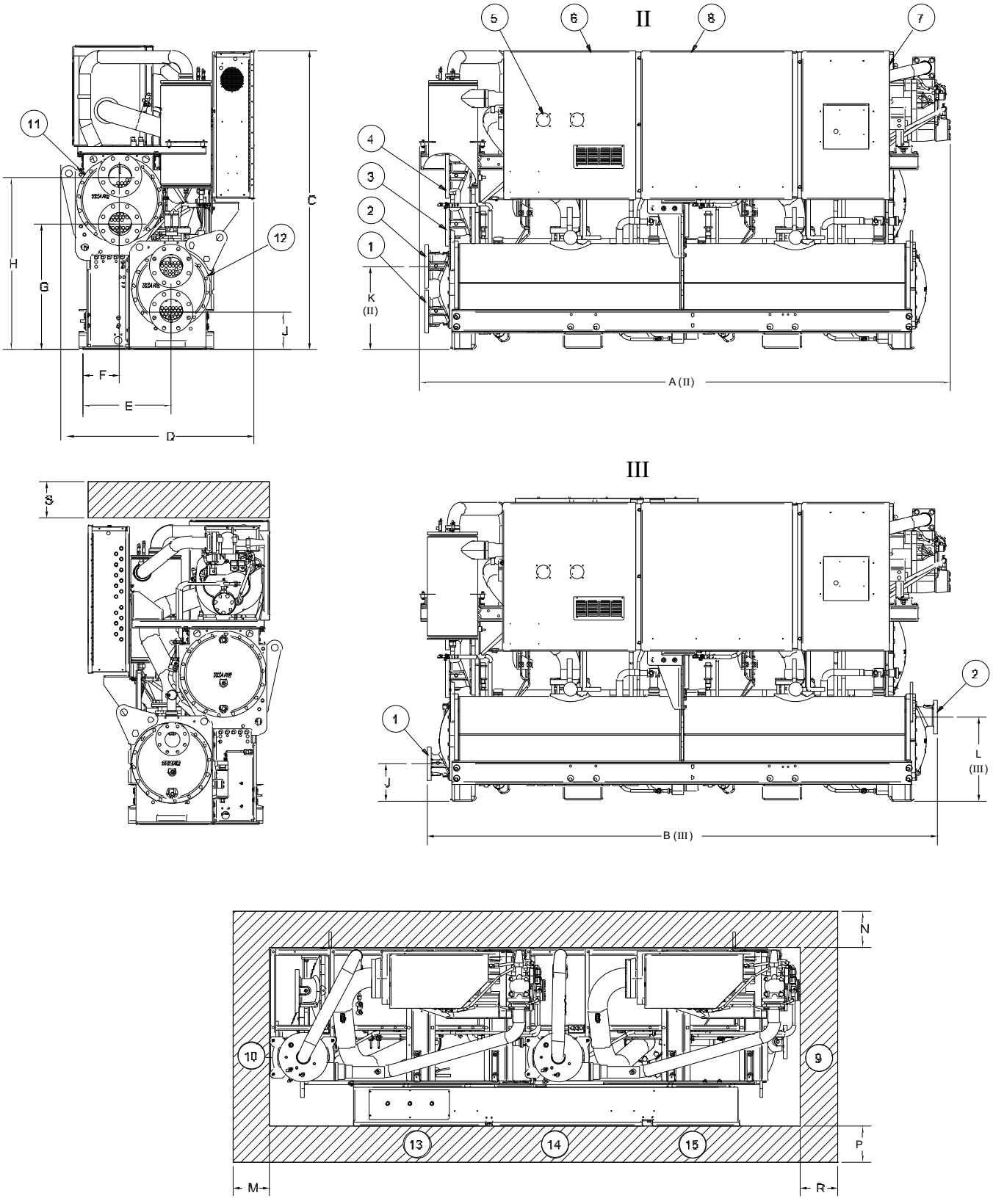


Table 26. 60 Hz Dimensions - 150-250 tons

RTWD	High Efficiency		Premium Efficiency
	150-200 inch/mm	220, 250 inch/mm	150-200 inch/mm
A (2 pass evap)	132.3/3360	136.1/3456	147.8/3755
B (3 pass evap)	132.3/3360	136.1/3456	150.8/3831
C	75.6/1920	76.9/1955	76.8/1950
D	49.4/1256	47.7/1212	49.4/1256
E	21.5/547	21.5/547	21.5/547
F	10.5/267	11.2/285	10.4/265
G	32.7/830	33.1/840	33.8/860
H	42.4/1078	43.9/1115	43.6/1108
J (2 pass evap)	10.1/256	10.6/270	10.6/270
J (3 pass evap)	9.5/241	9.7/247	9.7/247
K (2 pass evap)	19.3/490	20.6/524	20.6/524
L (3 pass evap)	19.9/505	21.6/549	21.6/550
M	36.0/914	36.0/914	36.0/914
N	36.0/914	36.0/914	36.0/914
P*	40/1016*	40/1016*	40/1016*
R	114.8/2916	114.8/2916	134.5/3416
S	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)]
II	2 Pass Evaporator Unit
III	3 Pass Evaporator Unit
*****	Control panel clearance is 36 or 40 inch (914 or1016 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).

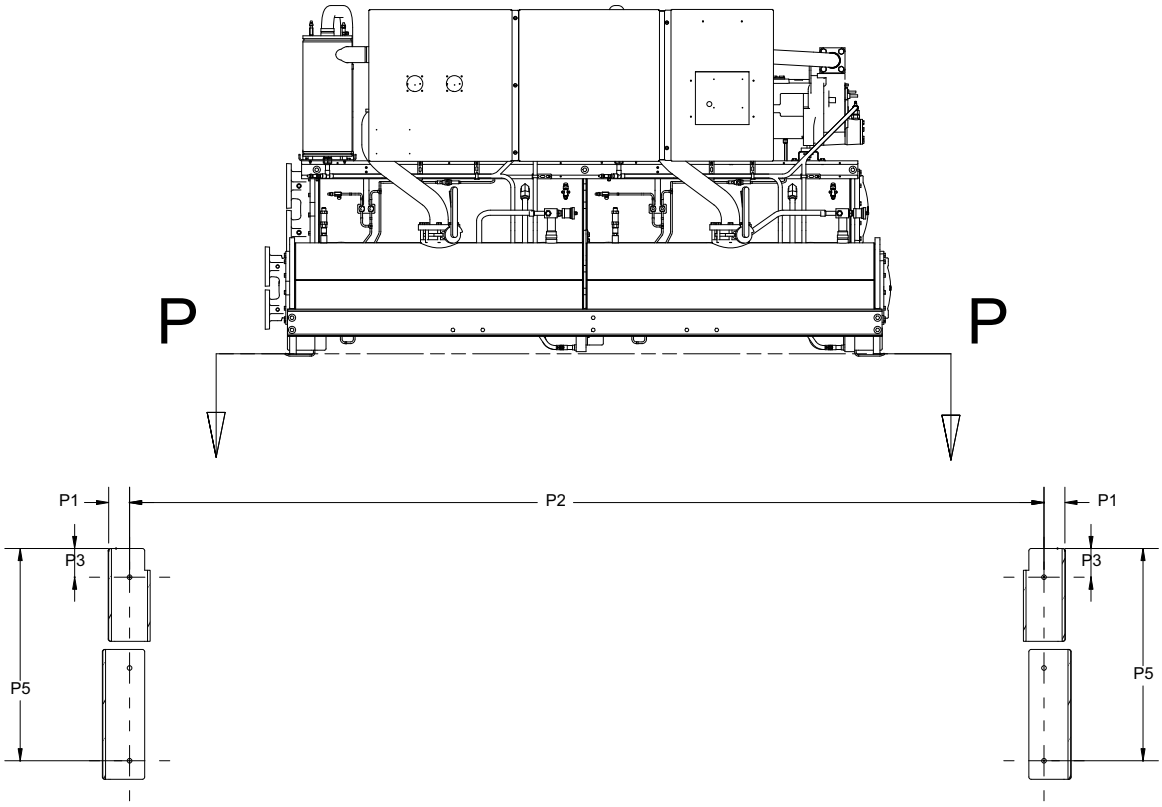


Figure 5. RTWD unit footprint – all sizes

	Standard Efficiency 80-150 ton	High Efficiency 70-130 ton	High Efficiency 140-250 ton	Premium Efficiency 150-200 ton
	inch/mm	**inch/mm**	**inch/mm**	**inch/mm**
P1	2.9/73	2.9/73	2.9/73	2.9/73
P2	124.0/3150	112.0/2845	112.0/2845	131.7/3344
P3	3.9/99	3.9/99	4.3/109	4.3/109
P4	28.8/732	28.8/732	29.3/743	29.3/743

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

Table 27. Weights - 60 Hz - I-P units

	Standard Efficiency		High Efficiency		Premium Efficiency	
Model	Operating Weight (lbs)	Shipping Weight (lbs)	Operating Weight (lbs)	Shipping Weight (lbs)	Operating Weight (lbs)	Shipping Weight (lbs)
80	5900	5703	5733	5551	N/A	N/A
90	5933	5721	5792	5587	N/A	N/A
100	6140	5902	6255	6025	N/A	N/A
110	6332	6074	6475	6208	N/A	N/A
120	6531	6248	6511	6230	N/A	N/A
130	6535	6243	6544	6248	N/A	N/A
140	6972	6650	N/A	N/A	N/A	N/A
150	N/A	N/A	7895	7555	8735	8254
160	N/A	N/A	8408	8047	9182	8702
180	N/A	N/A	8501	8109	9304	8783
200	N/A	N/A	8589	8168	9348	8814
220	N/A	N/A	9491	8993	N/A	N/A
250	N/A	N/A	10053	9462	N/A	N/A

Note: All weights +/-3%.
Weights include optional base rail fork lifting, subtract 300 lbs if this option is not selected.

Table 28. Weights - 60 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)
80	2676	2587	2600	2518	N/A	N/A
90	2691	2595	2627	2534	N/A	N/A
100	2785	2677	2837	2733	N/A	N/A
110	2872	2755	2937	2816	N/A	N/A
120	2962	2834	2953	2826	N/A	N/A
130	2964	2832	2968	2834	N/A	N/A
140	3162	3016	N/A	N/A	N/A	N/A
150	N/A	N/A	3581	3427	3962	3744
160	N/A	N/A	3814	3650	4165	3947
180	N/A	N/A	3856	3678	4220	3984
200	N/A	N/A	3896	3705	4240	3998
220	N/A	N/A	4305	4079	N/A	N/A
250	N/A	N/A	4560	4292	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, 3600 rpm 60 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 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 and Chinese code. The evaporator is designed for refrigerant-side/working-side pressure of 200 psig (13.8 bars).

All water pass arrangements are available with flanged 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 tubesheets and mechanically fastened to tube supports. Condenser tubes are 1.0 inch (25.4 mm) diameter on standard efficiency chillers and0.75 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 and Chinese 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 flanged connections with 150 psig (10.5 bars) waterside working pressure. Waterside shall be hydrostatically tested at 225 psig (15.5 bars).

Standard temperature condenser allow 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, 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, 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)
- 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 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 tests are available to certify chiller performance before shipment.

Two-Way Condenser Water Regulating Valve

For water regulation, a field-installed, 2-way butterfly-type (lug-style) valve, with integral electrical operator and factory-mounted valve actuator, is available. The single-phase, dual frequency, motor can be selected with 115 V (can be powered directly from control power transformer at unit) or 220 V power. The 2-way valve is field-wired and controlled by the chiller regulating valve control output. Valves are available in 3 and 4 inch (88.9 mm and 114.3 mm) sizes.

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).

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. Wye-delta starters are standard with 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.

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 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 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.

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