



Series R™ Helical Rotary Liquid Chillers

**Model RTWD Water-Cooled
Model RTUD Condenserless
235 - 945 kW**



RLC-PRC035F-GB



Introduction

To meet a wide range of applications in the 235-835 kW water-cooled market, Trane is proud to offer the model RTWD chiller and the condenserless compressor chiller version: the model RTUD. Both models are leading the industry in terms of application versatility, ease of installation, control precision, reliability, energy-efficiency, and operational cost-effectiveness.

The units are designed to deliver proven performance, plus all the benefits of an advanced heat transfer design with two low-speed, direct-drive compressors.

Important Design Advances and Features

- High Seasonal Efficiency (HSE) version with Adaptive Frequency Drive for premier part load efficiency reducing 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.

Features and Benefits

Reliability

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

High Performance

- Advanced design enables chilled water temperature control to $\pm 0.5^\circ\text{F}$ (0.28°C) for flow changes up to 10 percent per minute, plus handling of flow changes up to 30 percent per minute for variable flow applications.
- Two minute stop-to-start and five minute start-to-start anti-recycle timer allows tight chilled water temperature control in constant or transient low-load applications.
- High compressor lift capabilities for use with heat recovery and waterside heat pump applications allows highly efficient system design with minimal operational concerns.
- Tight water temperature control extends to operation of multiple chillers in parallel or series configurations, offering further system design flexibility for maximum efficiency.
- Optional LonTalk/Tracer Summit communications interface provides excellent, trouble-free 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.
- **Extended Partial Load Efficiency, HSE versions** – For applications where there is significant variation in the cooling load and where high part load efficiency is required, the HSE version with factory-mounted Advanced Frequency Drive (AFD), provides considerable advantages and savings.



Features and Benefits

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.
- 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 $\pm 0.56^{\circ}\text{C}$ by reacting to instantaneous load changes.
- Adaptive Control™ attempts to maintain chiller operation under adverse conditions, when many other chillers might simply shut down. This is accomplished by unloading the compressor due to high condensing pressure, low suction pressure and/or overcurrent.
- Easy-to-use operator interface displays all operating and safety messages, with complete diagnostics information, on a easily readable panel with a scrolling touch-screen display.
- New variable evaporator flow compensation maintains improved control stability of the leaving water temperature.

Application Considerations

Condenser Water Temperatures

With the model RTWD chiller, condenser head pressure control is necessary only if the unit starts with entering condenser water temperatures below 12.8°C, or between 7.2°C and 12.8°C, when a temperature increase of 0.56°C per minute to 12.8°C is not possible.

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

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

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

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

Variable Evaporator Flow and Short Evaporator Water Loops

Variable evaporator flow is an energy-saving design strategy which has quickly gained acceptance as advances in chiller and controls technology have made it possible. With its superior unloading compressor design and advanced Trane CH530 controls, the RTWD and RTUD have excellent capability to maintain leaving water temperature control within $\pm 0.28^\circ\text{C}$, 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 and RTUD. 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 $\pm 0.28^\circ\text{C}$ leaving evaporator temperature control. For applications in which system energy savings is most important and tight temperature control is classified as $\pm 1.1^\circ\text{C}$, 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 waterflow 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.



Application Considerations

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.

If a multiple-chiller building needs both heating and cooling, then a dedicated chiller such as a RTWD can be piped in side stream arrangement and thus be loaded to any capacity by varying its chilled-water setpoint. When operating, it cools the return chilled water temperature to the other chillers. An advantage of the side stream configuration is that the side stream chiller does not need to produce the design system supply-water temperature. It can produce the exact water temperature necessary to meet the required heating load. This allows the chiller to operate more efficiently because the cooling is produced at a higher chilled-water temperature.

Dry Cooler

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

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) [1450-rpm (50 Hz)] pumps. Specifying or using 3600-rpm (60 Hz) [3000-rpm (50 Hz)] condenser water and chilled water pumps must be avoided, because such pumps may operate with objectionable levels of noise and vibration. In addition, a low frequency beat may occur due to the slight difference in operating rpm between 3600-rpm (60 Hz) [3000-rpm (50 Hz)] water pumps and Series R chiller motors.

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

Model Number Descriptions

Digits 01, 02, 03, 04 – Chiller Model

RTWD = Water Cooled Chiller Series R™

RTUD - Compressor 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

170 = 170 Nominal Tons

170 = 170 Nominal Tons

180 = 180 Nominal Tons

190 = 190 Nominal Tons

190 = 190 Nominal Tons

200 = 200 Nominal Tons

220 = 220 Nominal Tons

250 = 250 Nominal Tons

260 = 260 Nominal Tons RTWD HSE only (with AFD)

270 = 270 Nominal Tons RTWD HSE only (with AFD)

Digit 08 – Unit Voltage

A = 200/60/3

B = 230/60/3

C = 380/50/3

D = 380/60/3

E = 400/50/3

F = 460/60/3

G = 575/60/3

Digit 09 – Manufacturing Plant

1 = Epinal, France

2 = Pueblo, USA

3 = Taicang, China

4 = Curitiba, Brazil

Digit 10, 11 – Design Sequence

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

Digits 12 – Unit Type

1 = Standard Efficiency/Performance

1 = Standard Efficiency/Performance

2 = High Efficiency/Performance

3 = Extra Efficiency/Performance (RTWD only)

Digit 13 – Agency Listing

A = UL Listed to US and Canadian Safety Standards

B = CE Listing

C = Manufactured to GB Standards

Digit 14 – Pressure Vessel Code

3 = Chinese Code-Imported Pressure Vessel

4 = Chinese Code-China Built Vessel

5 = PED

Digit 15 – Unit Application

A = Std Condenser <=95°F/35°C Entering Water Temperature (RTWD only)

B = High Temperature Condenser >95°F/35°C Entering Water Temperature (RTWD only)

C = Water-to-Water Heat Pump (RTWD only)

D = Remote Condenser by Trane (RTUD only)

E = Remote Condenser by Others (RTUD only)

Digit 16 – Pressure Relief Valve

1 = Single Relief Valve

2 = Dual Relief Valve with 3-Way Isolation Valve

Digit 17 – Water Connection Type

A = Grooved Pipe Connection

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 (RTWD only)

B = Without Condenser (RTUD only)

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

B = Adaptive Frequency Drive (HSE Version)

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

C = Disconnect Switch Wired to Fuses

D = Circuit Breaker

E = High Fault Rated Panel with Circuit Breaker

Digit 27 – Under/Over Voltage Protection

0 = No Under/Over Voltage Protection

1 = Under/Over Voltage Protection



Model Number Descriptions

Digit 28 – Unit Operator Interface

A = English
B = Spanish
D = French
E = German
F = Dutch
G = Italian
J = Portuguese-Portugal
R = Russian
T = Polish
U = Czech
V = Hungarian
W = Greek
X = Romanian
Y = Swedish

Digit 29 – Remote Interface (Digital Comm)

0 = No Remote Digital Communication
1 = LonTalk/Tracer Summit Interface
2 = Time of Day Scheduling
4 = Unit Level BACnet
5 = Modbus interface
4 = Unit Level BACnet

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 Pressure 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 (RTWD only)
A = Outdoor Air Temp Sensor-CWR/Low Ambient

Digit 35 – Condenser Leaving Hot Water Temp Control

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

Digit 36 – Power Meter

0 = No Power Meter
P = Power Meter

Digit 37 – Motor Current Analog Output (%RLA)

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

Digit 38 - A/C Fan Control

0 = No Fan control (RTWD only)
A = Fan Control by others (RTUD only)
B = Integral Fan Control (RTUD only)

Digit 39 – Low Ambient Fan Control Type

0 = No Low Ambient Fan Control Type (RTWD only)
1 = Two-speed fans (RTUD only)
2 = Variable Speed Fan with Analog Interface (RTUD only)

Digit 38 – A/C Fan Control

0 = No Condenser Refrigerant Pressure Output
A = No Fan Controls (RTWD)
B = Internal Fan Controls

Digit 39 – Low Ambient Fan Control

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

Digit 40 – Installation Accessories

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

Digit 41 – Flow Switch

0 = No Flow Switch
1 = 150 psi NEMA 1; Flow Switch x 1
2 = 150 psi NEMA 1; Flow Switch x 2
3 = 150 psi NEMA 4; Flow Switch x 1
4 = 150 psi NEMA 4; Flow Switch x 2
5 = 10 bar IP-67; Flow Switch x 1
6 = 10 bar IP-67; Flow Switch x 2
7 = Factory Installed Proof of Water Flow

Digit 42 – 2-Way Water Regulating Valve

0 = No 2-Way Water Regulating Valve

Digit 43 – Sound Reduction Package

0 = No Sound Reduction Package
A = Sound Reduction – Factory Installed
A = 3" 150 psi/88.9 mm 10.5 bar 115 V
B = 3" 150 psi/88.9 mm 10.5 bar 220 V
C = 4" 150 psi/114.3 mm 10.5 bar 115 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) (RTWD only)
1 = Nitrogen Charge (RTUD only)
1 = Nitrogen Charge

Digit 46 – Base Rail Forklifting

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

Model Number Descriptions

Digit 47 – Label and Literature Language

B = Spanish
C = German
D = English
E = French
F = Chinese - Simple
G = Chinese - Traditional
H = Dutch SI (Hollandais)
J = Italian
P = Polish
R = Russian
T = Czech
U = Greek
V = Portuguese
X = Romanian
Y = Turkish
Z = Slovak
1 = Croatian
2 = Hungarian

Digit 48 – Special

0 = None
S = Special

Digit 49 – 55

0 = None

Digit 56 – Shipping Package

0 = No Skid (Standard)
1 = Skid
2 = Shrink Wrap
3 = Skid + Shrink Wrap
4 = Container 1 Unit

Digit 57 – Control Panel IP 20 Protection

0 = No IP 20 Protection of Control Panel
1 = IP 20 Protection of Control Panel

Digit 58 – Pressure Gages

0 = Without Pressure Gages
1 = With Pressure Gages

Digit 59 – Performance Test Options

0 = No Performance Test
A = Standard Test TRANE Specifications (SES) (RTWD only)
0 = No Performance Test (RTUD only)
B = Customer Inspection w/ Standard 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 2. General Data – RTWD high efficiency (continued)

Size		130	140	160	180	200	220	250
Gross cooling capacity RTWD (1)	(kW)	490	534	581.6	641	703.2	769	840
Gross power input RTWD (1)	(kW)	93	101	108.3	120.7	132.4	147	160
Gross EER RTWD (1)		5.26	5.3	5.37	5.31	5.31	5.24	5.26
Gross ESEER RTWD		6.65	6.82	6.76	6.88	6.71	6.73	6.66
Net cooling capacity RTWD (1) (2)		488	531	578.8	637.9	700.1	765	836
Net power input RTWD (1) (4)		99	107	114	127.1	138.7	155	168
Net EER / Eurovent energy class RTWD (1) (4)		4.95/B	4.98/B	5.05/A	4.99/B	5.03/B	4.94/B	4.97/B
Net ESEER RTWD (4)		5.63	5.73	5.74	5.79	5.77	5.69	5.69
Main Power Supply		400-3-50	400-3-50	400-3-50	400-3-50	400-3-50	400-3-50	400-3-50
Compressor								
Quantity		2	2	2	2	2	2	2
Evaporator								
Water Storage	(L)	72.6	77.0	85	91	108	113.3	120.3
2 Pass Arrangement								
Water Conn. Size	(mm)	DN125 - 5" (139.7 mm)	DN125 - 5" (139.7 mm)	DN125 - 5" (139.7 mm)	DN125 - 5" (139.7 mm)	DN150 - 6" (168.3 mm)	DN150 - 6" (168.3 mm)	DN150 - 6" (168.3 mm)
Minimum Flow (3)	(L/s)	8.8	9.5	10.7	11.7	13.3	14.1	15.1
Maximum Flow (3)	(L/s)	32.4	34.9	39.1	43	48.6	51.5	55.3
3 Pass Arrangement								
Water Conn. Size	(mm)	DN100 - 4" (114.3 mm)	DN100 - 4" (114.3 mm)	DN100 - 4" (114.3 mm)	DN100 - 4" (114.3 mm)	DN100 - 4" (114.3 mm)	DN100 - 4" (114.3 mm)	DN100 - 4" (114.3 mm)
Minimum Flow (3)	(L/s)	5.9	6.4	7.13	7.82	8.83	9.3	10.1
Maximum Flow (3)	(L/s)	21.6	23.3	26.12	28.64	32.43	34.3	36.9
Condenser								
Water Storage	(L)	81.7	86.8	93	99	118	117.8	133.3
Water Conn. Size	(mm)	DN150 - 6" (168.3 mm)	DN150 - 6" (168.3 mm)	DN150 - 6" (168.3 mm)	DN150 - 6" (168.3 mm)	DN150 - 6" (168.3 mm)	DN150 - 6" (168.3 mm)	DN150 - 6" (168.3 mm)
Minimum Flow (3)	(L/s)	10.0	10.9	11.9	12.9	15.4	15.4	18.0
Maximum Flow (3)	(L/s)	36.7	39.9	43.7	47.5	56.4	56.4	65.9
General Unit								
Refrigerant Type		R-134a	R-134a	R134a	R134a	R134a	R-134a	R-134a
# Refrig Circuits		2	2	2	2	2	2	2
Refrigerant Charge (2)	(kg)	61/61	60/62	61/61	60/62	81/81	80/83	82/82
Oil Charge (2)	(L)	9.9/9.9	9.9/9.9	10/10	10/12	12/12	11.7/11.7	11.7/11.7

(1) Eurovent Conditions: Evaporator 7°C/12°C Condenser 30°C/35°C.

(2) Data containing information on two circuits is shown as circuit 1/circuit 2.

(3) Flow limits are for water only.

(4) Net performances based on EN 14511-2011



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.

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
 - Outdoor air temperature
 - Start/stop differential timers
 - Auto/Manual mode for EXV, slide valve, and head pressure control
 - Pump status and override
 - Chilled water reset settings
 - Optional external setpoints, including:
 - i. Chilled water
 - ii. Current-limit
 - iii. Condenser leaving hot water temperature setpoint
 - iv. Ice building
- Reports, listed on a single tabbed screen for easy access, including:
 - Evaporator
 - Condenser
 - Compressor
- Evaporator, condenser, and compressor reports containing all operational information on individual components, including:
 - Water temperatures
 - Refrigerant pressures, temperatures, and approach
 - Oil pressure
 - Flow switch status
 - EXV position
 - Head pressure control command
 - Compressor starts and run-time
 - Line phase percent RLA, amps, and volts
- Alarm and diagnostic information, including:
 - Flashing alarms with touch-screen button of alarm condition
 - Scrollable list of last ten active diagnostics
 - Specific information on applicable diagnostic from list of over one-hundred
 - Automatic or manual resetting diagnostic types

LonTalk/Tracer Summit Interface

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

Required features:

- LonTalk/Tracer Summit Interface

Additional options that may be used:

- Ice making
- Chilled water temperature reset - outdoor air

External devices required:

- Trane Tracer system or LonTalk compatible system level interface.

Tracer Summit

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

Energy Efficiency

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

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. If your project calls for an interface to other systems, Tracer Summit can share data via BACnet™, the ASHRAE open systems protocol.

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

Oil Separator Crankcase Heater : 2 x 125 W all sizes RTWD/RTUD

Compressor Crankcase Heater : 2 x 150 W all sizes RTWD/RTUD

Control Circuit : Factory-installed transformer all sizes RTWD/RTUD

Short Circuit Intensity : 35 kA maximum all size RTWD/RTUD

Table 10. Compressor Motor Electrical Data

Model	Nominal Voltage (V/Ph/Hz)	Maximum Current for Unit with Standard Condenser Application (A) (1)	Maximum Current for Unit with High Condenser Application (A) (2)	Unit Starting Current for Unit with Standard Condenser Application (A) (1)(3)	Unit Starting Current for Unit with High Condenser Application (A) (2)(3)
RTWD 060 HE	400/3/50	102	142	152	167
RTWD 070 HE	400/3/50	124	166	177	193
RTWD 080 HE	400/3/50	142	187	192	208
RTWD 090 HE	400/3/50	161	208	206	224
RTWD 100 HE	400/3/50	176	228	242	260
RTWD 110 HE	400/3/50	192	248	254	275
RTWD 120 HE	400/3/50	209	267	291	312
RTWD 130 HE	400/3/50	227	287	304	327
RTWD 140 HE	400/3/50	244	311	346	369
RTWD 160 SE	400/3/50	286	377	391	419
RTWD 160 HE	400/3/50	261	335	359	387
RTWD 160 PE	400/3/50	261	335	359	387
RTWD 170 SE	400/3/50	311	419	410	451
RTWD 180 PE	400/3/50	286	377	391	419
RTWD 180 HE	400/3/50	286	377	391	419
RTWD 190 SE	400/3/50	343	458	473	514
RTWD 200 SE	400/3/50	374	496	497	543
RTWD 200 PE	400/3/50	311	419	410	451
RTWD 200 HE	400/3/50	311	419	410	451
RTWD 220 HE	400/3/50	343	458	473	514
RTWD 250 HE	400/3/50	374	496	497	543
RTWD 060 HSE	400/3/50	130	99	Linear	Linear
RTWD 070 HSE	400/3/50	153	122	Linear	Linear
RTWD 080 HSE	400/3/50	174	144	Linear	Linear
RTWD 090 HSE	400/3/50	189	154	Linear	Linear
RTWD 100 HSE	400/3/50	205	167	Linear	Linear
RTWD 110 HSE	400/3/50	220	181	Linear	Linear
RTWD 120 HSE	400/3/50	240	198	Linear	Linear
RTWD 130 HSE	400/3/50	259	215	Linear	Linear
RTWD 140 HSE	400/3/50	283	233	Linear	Linear
RTWD 160 HSE	400/3/50	306	250	Linear	Linear
RTWD 180 HSE	400/3/50	342	273	Linear	Linear
RTWD 200 HSE	400/3/50	378	295	Linear	Linear
RTWD 220 HSE	400/3/50	413	326	Linear	Linear
RTWD 250 HSE	400/3/50	448	357	Linear	Linear
RTWD 260 HSE	400/3/50	516	387	Linear	Linear
RTWD 270 HSE	400/3/50	561	421	Linear	Linear

(1) Digit 15 = A : Standard Condenser <= 35°C entering water temperature

(2) Digit 15 = B or C or D or E

(3) Wye-Delta start - One compressor at full load - the other compressor starting



Electrical Data

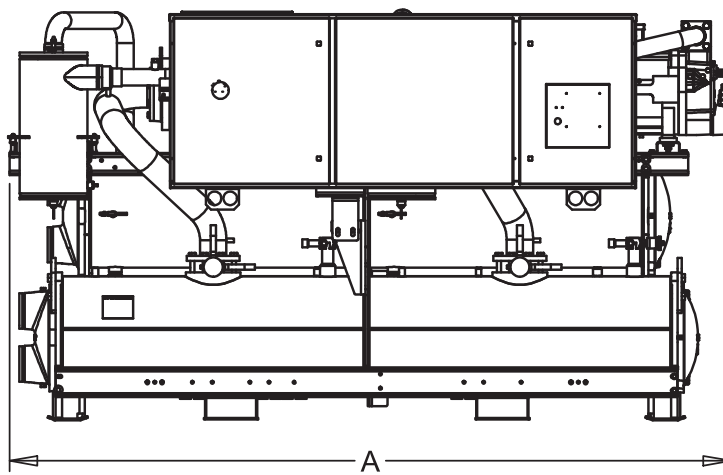
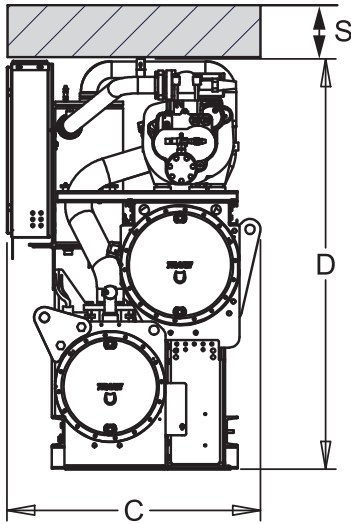
Table 11. Electrical Connection RTWD SE, HE, XE and RTUD

Unit size	Nominal Voltage (V/Ph/Hz)	Efficiency	Digit 15 (Evaporator application)	RLA	Fuse Size (A)	Disconnect Switch Size (A)	Maximum Connecting Wire (mm ²)	Bus Bar Width (mm)
160	400/3/50	SE	A	98 / 117	160 / 200	6 x 250	2 x 185	32
160	400/3/50	SE	B,C,D,E	126 / 158	200 / 250	6 x 400	2 x 240	45
170	400/3/50	SE	A	117 / 117	200 / 200	6 x 250	2 x 185	32
170	400/3/50	SE	B,C,D,E	158 / 158	250 / 250	6 x 400	2 x 240	45
190	400/3/50	SE	A	117 / 141	200 / 250	6 x 250	2 x 185	32
190	400/3/50	SE	B,C,D,E	158 / 187	250 / 315	6 x 400	2 x 240	45
200	400/3/50	SE	A	141 / 141	250 / 250	6 x 250	2 x 185	32
200	400/3/50	SE	B,C	187 / 187	315 / 315	6 x 400	2 x 240	45
060	400/3/50	HE	A	38 / 38	63 / 63	6 x 160	2 x 95	20
060	400/3/50	HE	B,C,D,E	53 / 53	80 / 80	6 x 160	2 x 95	20
070	400/3/50	HE	A	46 / 46	80 / 80	6 x 160	2 x 95	20
070	400/3/50	HE	B,C,D,E	62 / 62	100 / 100	6 x 160	2 x 95	20
080	400/3/50	HE	A	46 / 60	80 / 125	6 x 160	2 x 95	20
080	400/3/50	HE	B,C,D,E	62 / 78	100 / 125	6 x 160	2 x 95	20
090	400/3/50	HE	A	60 / 60	100 / 100	6 x 160	2 x 95	20
090	400/3/50	HE	B,C,D,E	78 / 78	125 / 125	6 x 160	2 x 95	20
100	400/3/50	HE	A	60 / 72	100 / 125	6 x 160	2 x 95	20
100	400/3/50	HE	B,C,D,E	78 / 93	125 / 160	6 x 160	2 x 95	20
110	400/3/50	HE	A	72 / 72	125 / 125	6 x 160	2 x 95	20
110	400/3/50	HE	B,C,D,E	93 / 93	160 / 160	6 x 160	2 x 95	20
120	400/3/50	HE	A	72 / 85	125 / 160	6 x 160	2 x 95	20
120	400/3/50	HE	B,C,D,E	93 / 108	160 / 160	6 x 160	2 x 95	20
130	400/3/50	HE	A	85 / 85	125 / 125	6 x 250	2 x 185	32
130	400/3/50	HE	B,C,D,E	108 / 108	160 / 160	6 x 250	2 x 185	32
140	400/3/50	HE	A	85 / 98	125 / 160	6 x 250	2 x 185	32
140	400/3/50	HE	B,C,D,E	108 / 126	160 / 200	6 x 250	2 x 185	32
160	400/3/50	HE	A	98 / 98	160 / 160	6 x 250	2 x 185	32
160	400/3/50	HE	B,C	126 / 126	200 / 200	6 x 250	2 x 185	32
180	400/3/50	HE	A	98 / 117	160 / 200	6 x 250	2 x 185	32
180	400/3/50	HE	B,C	126 / 158	200 / 250	6 x 400	2 x 240	45
200	400/3/50	HE	A	117 / 117	200 / 200	6 x 250	2 x 185	32
200	400/3/50	HE	B,C	158 / 158	250 / 250	6 x 400	2 x 240	45
220	400/3/50	HE	A	117 / 141	200 / 250	6 x 250	2 x 185	32
220	400/3/50	HE	B,C,D,E	158 / 187	250 / 315	6 x 400	2 x 240	45
250	400/3/50	HE	A	141 / 141	250 / 250	6 x 250	2 x 185	32
250	400/3/50	HE	B,C,D,E	187 / 187	315 / 315	6 x 400	2 x 240	45
160	400/3/50	XE	A	98 / 98	160 / 160	6 x 250	2 x 185	32
160	400/3/50	XE	B,C	126 / 126	200 / 200	6 x 250	2 x 185	32
180	400/3/50	XE	A	98 / 117	160 / 200	6 x 250	2 x 185	32
180	400/3/50	XE	B,C	126 / 158	200 / 250	6 x 400	2 x 240	45
200	400/3/50	XE	A	117 / 117	200 / 200	6 x 250	2 x 185	32
200	400/3/50	XE	B,C	158 / 158	250 / 250	6 x 400	2 x 240	45

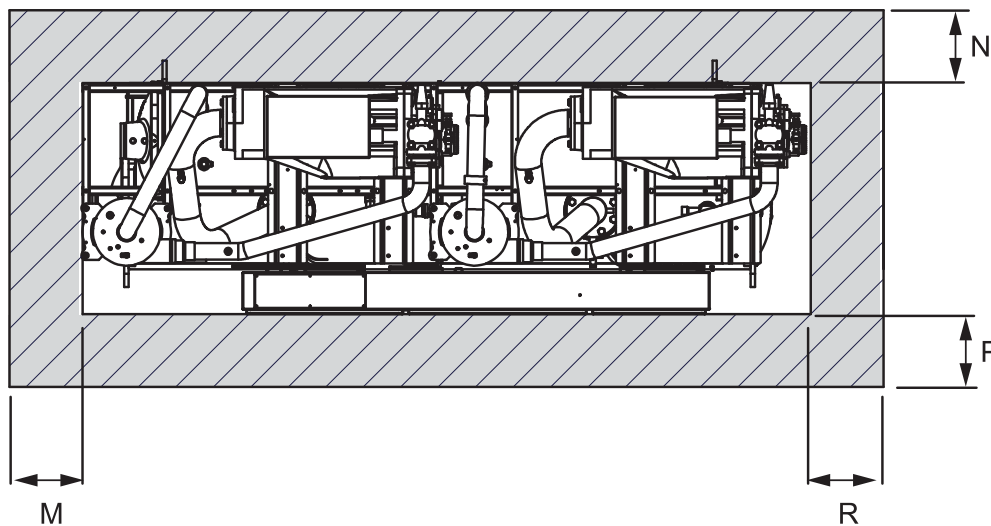
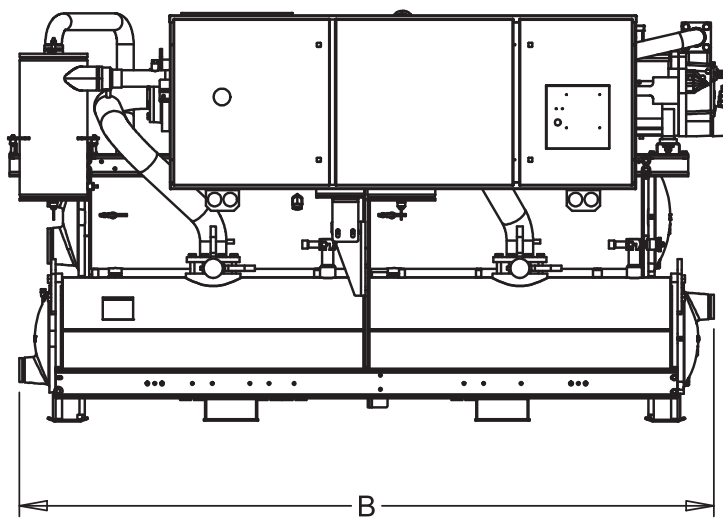
Dimensions

RTWD SE, HE, XE

2 PASS EVP



3 PASS EVP





Dimensions

Table 13. Dimensions

RTWD Unit size	A mm	B mm	C mm	D mm	M mm	N mm	P mm	R mm	S mm
160SE	3490	3490	1310	1970	920	920	1020	2920	920
170SE	3490	3490	1310	1970	920	920	1020	2920	920
190SE	3490	3490	1310	1970	920	920	1020	2920	920
200SE	3490	3490	1310	1970	920	920	1020	2920	920
60HE	3210	3320	1070	1940	920	920	920	2920	920
70HE	3210	3320	1070	1940	920	920	920	2920	920
80HE	3210	3320	1070	1940	920	920	920	2920	920
90HE	3230	3320	1060	1960	920	920	920	2920	920
100HE	3320	3320	1060	1960	920	920	920	2920	920
110HE	3230	3320	1060	1960	920	920	920	2920	920
120HE	3240	3320	1060	1960	920	920	920	2920	920
130HE	3400	3400	1280	1950	920	920	920	2920	920
140HE	3400	3400	1280	1950	920	920	920	2920	920
160HE	3400	3400	1280	1950	920	920	1020	2920	920
180HE	3490	3490	1310	1970	920	920	1020	2920	920
200HE	3490	3490	1310	2010	920	920	1020	2920	920
220HE	3490	3490	1310	2010	920	920	1020	2920	920
250HE	3490	3490	1310	2010	920	920	1020	2920	920
160PE	3760	3830	1280	2010	920	920	1020	3420	920
180PE	3810	3830	1310	2010	920	920	1020	3420	920
200PE	3490	3490	1310	2010	920	920	1020	2920	920
060 HSE	3210	3320	1130	1940	920	920	920	2920	920
070 HSE	3210	3320	1130	1940	920	920	920	2920	920
080 HSE	3210	3320	1130	1940	920	920	920	2920	920
090 HSE	3230	3320	1120	1960	920	920	920	2920	920
100 HSE	3320	3320	1120	1960	920	920	920	2920	920
110 HSE	3230	3320	1120	1960	920	920	920	2920	920
120 HSE	3240	3320	1120	1960	920	920	920	2920	920
130 HSE	3400	3400	1300	1950	920	920	920	2920	920
140 HSE	3400	3400	1300	1950	920	920	920	2920	920
160 HSE	3760	3830	1300	2010	920	920	1020	3420	920
180 HSE	3810	3830	1330	2010	920	920	1020	3420	920
200 HSE	3490	3490	1340	2010	920	920	1020	2920	920
220 HSE	3490	3490	1340	2010	920	920	1020	2920	920
250 HSE	3490	3490	1340	2010	920	920	1020	2920	920
260 HSE	3490	3490	1340	2010	920	920	1020	2920	920
270 HSE	3490	3490	1340	2010	920	920	1020	2920	920

Note: These dimensions are the maximum for a specific size, they may vary from one configuration to another within a same size. For accurate dimensions of your specific configuration, refer to relevant submittal drawings.

Dimensions

Table 14. RTWD SE, HE, PE and RTUD unit footprint - all sizes

mm	High Efficiency 60-120 tons	High Efficiency 130-180 tons	Standard Efficiency 160-200 tons	Extra Efficiency 160-180 tons	Extra Efficiency 200 tons	High Efficiency 200-250 tons
P1	76	76	76	76	76	76
P2	2845	2845	2845	3353	2845	2845
P3	61	109	109	109	109	109
P4	671	744	744	744	744	744

Note: Base hole diameter all 16 mm

Table 15. RTWD HSE unit footprint

mm	60-120 tons	130-140 tons	160-180 tons	200 tons	220-270 tons
P1	76	76	76	76	76
P2	2845	2845	3353	2845	2845
P3	61	109	109	109	109
P4	671	744	744	744	744

Table 16. RTWD/RTUD weights

Model	Operating Weight (Kg)	Shipping Weight (Kg)
RTWD 160 SE	3874	3718
RTWD 170 SE	4049	3881
RTWD 190 SE	4086	3900
RTWD 200 SE	4125	3924
RTWD 060 HE	2650	2568
RTWD 070 HE	2658	2573
RTWD 080 HE	2673	2637
RTWD 090 HE	2928	2812
RTWD 100 HE	2970	2849
RTWD 110 HE	3008	2883
RTWD 120 HE	3198	3065
RTWD 130 HE	3771	3616
RTWD 140 HE	3802	3638
RTWD 160 HE	3846	3668
RTWD 180 HE	4042	3851
RTWD 200 HE	4488	4262
RTWD 220 HE	4504	4273
RTWD 250 HE	4579	4326
RTWD 160 PE	4172	3954
RTWD 180 PE	4408	4175
RTWD 200 PE	4625	4357

Note: All weights +/- 3% - add 62 Kg for units with sound acoustic package. Weights are maximum for each size and may vary from one configuration to another for the same size.

Dimensions

Table 16. RTWD/RTUD weights (continued)

Model	Operating Weight (Kg)	Shipping Weight (Kg)
RTWD 060 HSE	2788	2706
RTWD 070 HSE	2796	2711
RTWD 080 HSE	2829	2793
RTWD 090 HSE	3102	2986
RTWD 100 HSE	3144	3023
RTWD 110 HSE	3182	3057
RTWD 120 HSE	3372	3239
RTWD 130 HSE	3945	3790
RTWD 140 HSE	3996	3832
RTWD 160 HSE	4386	4168
RTWD 180 HSE	4622	4389
RTWD 200 HSE	4839	4571
RTWD 220 HSE	4718	4487
RTWD 250 HSE	4793	4540
RTWD 260 HSE	4718	4487
RTWD 270 HSE	4793	4540
RTUD 060	2260	2223
RTUD 070	2269	2229
RTUD 080	2329	2284
RTUD 090	2440	2382
RTUD 100	2468	2410
RTUD 110	2507	2445
RTUD 120	2683	2618
RTUD 130	3151	3078
RTUD 140	3164	3087
RTUD 160	3310	3225
RTUD 170	3421	3346
RTUD 180	3485	3393
RTUD 190	3429	3345
RTUD 200	3584	3476
RTUD 220	3623	3510
RTUD 250	3645	3525

Note: All weights +/- 3% - add 62 Kg for units with sound acoustic package. Weights are maximum for each size and may vary from one configuration to another for the same size.



Mechanical Specifications

General

Exposed metal surfaces are painted with air-dry beigewhite, 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 (3000 rpm 50 Hz) rotary compressors that include a load/unload valve, rolling element bearings, oil filtration device and heater. The motor is a suction gas-cooled, hermetically sealed, two-pole squirrel cage induction motor. Oil separator device is provided separate from the compressor. Check valves in the compressor discharge and lube oil system and a solenoid valve in the lube system are also provided.

Unit-Mounted Starter (RTWD SE, HE, PE)

The unit is supplied with a UL 1995 indoorIP-22IP-44 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 (120/110 V Vac secondary) and Trane CH530 module power (24 Vac secondary). Optional starter features include circuit breaker, high fault panel with circuit breaker, or disconnect switch wired to fuses/mechanical, non-fused disconnect.

Adaptive Frequency Drive (RTWD HSE)

RTWD HSE will fit an Adaptive Frequency Drive, factory-mounted, tested and wired. Frequency converter will be chosen by the manufacturer based on the present motor current at maximum loading of the unit, and will drive the chiller start and ramp up, as long as the partial load operation. AFD enclosure will be IP54 as standard, with integrated air cooling system, consisting in a fan below the AFD frame, with no obstacle to the air circulation.

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 19.05 mm diameter on RTWD extra efficiency and RTWD/RTUD high efficiency models. Evaporator tubes are 25.4 mm on RTWD/RTUD standard efficiency models. All tubes can be individually replaced.

Shells and tube sheets are made of carbon steel. Designed, tested, and stamped in accordance with PED code. The evaporator is designed for refrigerant-side/working-side pressure of 14 bars.

All water pass arrangements are available with grooved connections with 10 bars waterside working pressure. Waterside shall be hydrostatically tested at 14.5 bars.

Condenser (RTWD only)

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 19.05 mm diameter on RTWD extra efficiency and high efficiency models. Condenser tubes are 25.4 mm on RTWD standard efficiency models. All tubes can be individually replaced.

Shells and tube sheets are made of carbon steel. Designed, tested, and stamped in accordance with PED code. The condenser is designed for refrigerant-side/working-side pressure of 21 bars.

Water side has single inlet and outlet piping connection. All water pass arrangements are available with grooved connections with 10 bars waterside working pressure. Waterside shall be hydrostatically tested at 14.5 bars.

Standard temperature condenser allow for leaving condenser water temperature up to 40.6°C and for entering condenser water temperatures up to 35°C.

Refrigerant Circuit

Each unit has two refrigerant circuits, with one rotary screw compressor per circuit. Each refrigerant circuit includes compressor suction and discharge service valves, liquid line shut off valve, removable core filter, charging port and an electronic expansion valve. Modulating compressors and electronic expansion valves provide variable capacity modulation over the entire building load and maintain proper refrigerant flow.

Oil Management

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

Mechanical Specifications

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

Options

Dual Relief Valve

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

Flanged Water Connection Kit

Kit to convert all four water connections from grooved pipe to flanged connections. This includes: grooved couplings and pipe offsets.

High-Temperature Condenser

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

Insulation

The evaporator and water boxes are covered with factory installed 19 mm insulation. Factory installed foam insulation is used on the suction line, liquid level sensor, oil return system assembly (with its associated piping).

Insulation for High Humidity

The evaporator and water boxes are covered with factory installed 38 mm insulation. Factory installed foam insulation is used on the motor housing, suction line, liquid level sensor, and oil return system assembly (with its associated piping).

Isolators

Molded elastomeric isolators ship with the unit.

Low-Temperature Evaporator

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

Pressure Gauges

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

Water-to-Water Heat Pump

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

Base Rail Forklifting

Special design of the unit base to allow forklifting of the chiller on the jobsite.

Electrical Options:

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.

Disconnect Switch Wired to Fuses

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

IP 20 Protection of Control Panel

Provides protection of all live contacts including the ones which are energized after the disconnect switch is in the "ON" position and the unit is operating with the electrical panel opened. Electrical panel is built in accordance with NF EN 60529 standard.

Under/Over-Voltage Protection

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

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 (RTWD only)

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

Condenser Differential Pressure Output (RTWD only)

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 (RTWD only)

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 (RTWD only)

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

External Chilled Water or Hot Water Setpoint

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

External Current-Limiting

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

LonTalk/Tracer Summit Interface

LonTalk (LCI-C) or Tracer Summit communications capabilities are available, with communication link via single twistedpair 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.



Notes



Notes



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